College Catalog
2015-2016
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WELCOME TO TIDEWATER COMMUNITY COLLEGE

As a Tidewater Community College student, you are joining a rich culture that is as diverse as the communities we serve—a culture that collectively claims your success as its central tenet. We are committed to your success and providing you a quality learning experience.

Making success a reality for all students requires a significant investment of time and effort by faculty and staff as well as a considerable investment in physical and personnel resources that support a comprehensive and dynamic learning environment. Your success is the return on our investment.

This catalog describes a broad range of programs and services reflective of the faculty's expertise and commitment to preparing you for transfer, to further your career, or for personal interest. I encourage you to take advantage of all that Tidewater Community College has to offer by engaging faculty, staff, and your peers on the path to achieving your academic, career, and personal goals.

This is an exciting time to be a Tidewater Community College student. From here, you really can go anywhere!

Sincerely,

Daniel T. DeMarte
Vice President for Academic Affairs and Chief Academic Officer
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PORTSMOUTH CAMPUS
120 Campus Drive
Portsmouth, VA 23701
757-822-2124
VIRGINIA BEACH CAMPUS
1700 College Crescent
Virginia Beach, VA 23453
757-822-7100
REGIONAL AUTOMOTIVE CENTER
600 Innovation Drive
Chesapeake, VA 23320
757-822-5081

TCC AT TRI-CITIES CENTER
1070 University Boulevard
Portsmouth, VA 23703
757-822-2623

CENTER FOR WORKFORCE SOLUTIONS
7000 College Drive
Suffolk, VA 23703
757-822-1234

VISUAL ARTS CENTER
340 High Street
Portsmouth, VA 23704
757-822-1888
THE COLLEGE

Tidewater Community College, founded in 1968, is one of 23 two-year colleges that make up the Virginia Community College System (VCCS). Serving the cities of Chesapeake, Norfolk, Portsmouth, Virginia Beach, and portions of Suffolk, the college offers a comprehensive range of programs designed to meet the educational and training needs of the people it serves. Programs of study lead to associate degrees or certificates; they include the first two years of university-parallel instruction and over 140 career and technical programs. The college also offers both credit and non-credit continuing education and special workforce training programs. TCC is the largest provider of higher education and workforce development services in Hampton Roads, enrolling about 45,000 students annually – the second largest undergraduate student body in the Commonwealth of Virginia.

TCC has grown from a single location to four campuses, as well as district administrative offices, a regional visual arts center, a regional automotive center, a historical theater, a regional health professions center, an advanced technology center, and a regional workforce development center. Classes are also offered at other off-campus locations such as military installations.

TCC’s central offices are located in the Joseph N. Green, Jr. District Administration Building at 121 College Place, Norfolk. The facility houses the Office of the President and the offices of Student Learning and Academic Services, Student Success and Enrollment Management, Administrative Services, Development and the TCC Educational Foundation, Financial Services, Information Systems, Institutional Advancement, and Institutional Effectiveness. Within those offices are the college’s central administrative staff in the functional areas of accounting & payroll, educational technology, emergency preparedness, facilities, grants & sponsored programs, human resources, instructional resources, purchasing, safety & security, student records, and the Women’s Center.

TCC’s Center for Workforce Solutions, located in northern Suffolk, provides training, education, assessments, and services for area businesses to enhance their success.

TCC campuses now feature student centers, which provide offices and meeting space for student groups and clubs, cafes, fitness equipment and recreation. Licensed child care is offered on all campuses in partnership with the YWCA of South Hampton Roads.

TCC HISTORY

The college’s original location, formerly the site of Frederick College, was donated to the Commonwealth of Virginia by Fred W. Beazley and the Beazley Foundation. It opened in the fall of 1968 and became the site of the Portsmouth Campus. Overlooking Hampton Roads harbor, the campus was located in what eventually became northern Suffolk. The Fred W. Beazley Portsmouth Campus moved to the Victory Village section of the city in 2010.

Portsmouth Campus: A statewide bond referendum in 2002 provided initial funding to relocate the Portsmouth Campus from northern Suffolk into the city of Portsmouth to better serve the educational needs of the city and the region while maintaining the comprehensive programmatic offerings of the campus. The Fred W. Beazley Portsmouth Campus consists of three academic and administrative buildings with state-of-the-art technology, instructional labs, and equipment designed to provide a learning-centered environment. It is also the home of the Beazley School of Nursing. Its student center opened in 2013.

The TCC Visual Arts Center, part of TCC’s Portsmouth Campus, is located in historic Olde Towne Portsmouth. It is Virginia’s first community college center dedicated solely to arts and art education. The state-of-the-art facility offers degrees in Graphic Design and Studio Arts, and includes a roof top glassblowing studio, classroom studios, MAC laboratories, a Books and Images Library, the Belle B. Goodman and Michael F. LaBouvé Galleries, and the Anne S. Iott Permanent Art Collection.

Virginia Beach Campus: In 1971, TCC established the Virginia Beach Campus in temporary quarters on Camp Pendleton, a state military installation. After the City of Virginia Beach donated land to TCC, a permanent campus opened in 1974 at the city’s geographical center. Seven academic buildings, each named for a borough of Virginia Beach, house academic programs, administrative offices, and student services. Recent additions to the campus include the Advanced Technology Center, the Science Building, the Regional Health Professions Center, and the Center for Military and Veterans Education. The Joint-Use Library, a partnership with the City of Virginia Beach, and a student center opened in 2013.

Chesapeake Campus: The Chesapeake Campus was established in 1973, when the City of Chesapeake purchased and donated the former Chesapeake College site to TCC. The campus is located between the communities of Great Bridge and Deep Creek. The George B. Pass Building houses academic programs, administrative offices, laboratories, student services, and a library. The Marian P. Whitehurst Technology Center houses academic programs, administrative offices, laboratories, and a conference center. A new Academic Building opened in 2013, and the student center opened in 2014.
A state-of-the-art Regional Automotive Center, located in the Oakbrooke Business and Technology Center, is part of the Chesapeake Campus. It opened for classes in 2008. As the only high tech educational facility for the automotive industry in Hampton Roads, the center includes classrooms, instructional laboratory bays, and an automotive “showroom” area.

**Norfolk Campus:** The Norfolk Campus opened in January 1997 as a part of the city’s downtown revitalization. The Martin Building, donated by the heirs of Alvah H. Martin, houses a library, classrooms, and faculty and administrative offices. The Mason C. Andrews Science Building houses the Ada R. Michaels Student Services Area, laboratories, classrooms, and faculty offices. The Stanley C. Walker Technologies Building houses computer laboratories, classrooms, and faculty offices. The TCC Jeanne and George Roper Performing Arts Center houses classrooms, computer laboratories and a restored 1926 theater that seats over 800. The award-winning student center opened in 2011.

**TIDWATER COMMUNITY COLLEGE MISSION STATEMENT**

Tidewater Community College provides collegiate education and training to adults of all ages and backgrounds, helping them achieve their individual goals and contribute as citizens and workers to the vitality of an increasingly global community.

Commitments that inform the mission:

- Open access to high-quality, affordable education to prepare students for transfer to a four-year baccalaureate institution, as well as for entry or advancement in the workforce.
- Cultural diversity as a critically important strength for students to meet the changing needs of a pluralistic, democratic society.
- Lifelong learning to heighten the awareness of students to multiple paths for achievement, while helping them pursue the choices most conducive to their individual needs.
- Partnerships and proactive responsiveness to develop cutting-edge programs that meet the changing needs of students and industry, while contributing to the economic, civic and cultural vitality of the region, the Commonwealth, the nation, and the international community.
- A comprehensive range of programs and services recognized for excellence by leaders of business, industry, and government, and by educators in K-12 education and four-year colleges and universities.

**ACCREDITATION AND GOVERNING BOARD**

Tidewater Community College is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award the associate degree. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call 404-679-4500 for questions about the accreditation of Tidewater Community College.

The State Board for Community Colleges governs TCC, a member institution of the Virginia Community College System. The State Board approves the college’s associate degrees and certificates. The Tidewater Community College Board approves the college’s career studies certificates.

**Certain curricula of the college are accredited by specialized accrediting organizations. They include the following:**

- **The Automotive Technology programs** (general automotive, Mopar CAP, Honda PACT, and Toyota T-TEN): accredited by the National Automotive Technicians Education Foundation (NATEF).
- **The Culinary Arts program:** accredited by the American Culinary Federation’s accrediting commission.
- **The Funeral Service program:** accredited by the American Board of Funeral Service Education.
- **The Health Science programs:** accredited by the Accreditation Council for Occupational Therapy Education, the Commission on Accreditation for Health Informatics and Information Management Education, the Commission on Accreditation in Physical Therapy Education, the Joint Review Committee on Education in Diagnostic Medical Sonography, the Joint Review Committee on Education in Radiologic Technology, the Committee on Accreditation for Respiratory Care, the Accreditation Commission for Education in Nursing, the Virginia Board of Nursing, and the Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions.

**COLLEGE GOVERNANCE**

The collegial governance of Tidewater Community College is founded on the belief that the internal constituencies of the institution—administration, faculty, classified employees, and students—are to be genuinely represented and have a meaningful voice in the decisions affecting the operation, policy development, and strategic planning of the college. The purpose of the TCC governance structure is to define the roles that board members, administrators, faculty, classified staff, and students should play in shared responsibility and cooperative action. The design of the governance system adheres to two basic operating principles—that people's time is a precious commodity that should not be wasted, and that people do their best work when there is a high expectation that their work will matter.

Mutual trust, good faith, support, and commitment to the institution and its students are essential to the success of shared
governance. Because shared governance is intended to serve the entire college, it is incumbent upon all constituent groups, committees, and task forces to ensure that representation from all areas of the college is fair, timely, and inclusive.

For further information on college governance, visit the college website at www.tcc.edu, search keyword: governance.

TIDEWATER COMMUNITY COLLEGE EDUCATIONAL FOUNDATION, INC.
The Tidewater Community College Educational Foundation, Inc. accepts contributions and gifts that support the college, its programs, and its students. The Foundation is incorporated in the Commonwealth of Virginia and is approved by the Internal Revenue Service as a nonprofit, tax-exempt charitable organization.

Gifts and contributions to the foundation are tax deductible for the donor and can be made in the form of cash, negotiable securities, equipment, facilities, supplies, real estate, or buildings. Donors can designate the foundation as part of their estate planning and/or as a beneficiary in insurance policies; they may also establish memorial funds through the foundation on behalf of individuals and families.

TIDEWATER COMMUNITY COLLEGE ALUMNI ASSOCIATION
The TCC Alumni Association provides a lifelong connection to the college for those who have advanced their careers or begun the work toward a bachelor's degree since 1968. The more than 500,000 people who have studied at TCC are all eligible for membership in the Alumni Association, and the more than 100,000 individuals who have received a degree or completed over 24 credit hours are automatically included on its rolls. Founded in 2010, the Association is led by a board of directors, including ten honorary members who hold positions of distinction in local and state government. For more information, visit www.tidewateralumni.org.

VIRGINIA TIDEWATER CONSORTIUM
Tidewater Community College is a member of the Virginia Tidewater Consortium for Higher Education. For further information, contact Enrollment Services or visit www.vtc.edu.edu.

PROGRAMS
As a comprehensive institution of higher education, Tidewater Community College offers transfer and career/technical programs generally extending no longer than two years beyond the high school level.

CAREER AND TECHNICAL EDUCATION DEGREES AND CERTIFICATES
Career and technical education degree, certificate, and career studies certificate programs prepare students for employment. These programs are designed to meet regional demand for technicians, paraprofessionals, skilled craft workers, and specialized office workers in industry, business, government, and other professional fields. These programs normally require two years or less of training beyond high school to prepare students for success in meeting the demands in agriculture, business, engineering, health and medicine, industry, service, and other technical and occupational fields. Students may access gainful employment consumer information for each certificate and career studies certificate program offered by the college at http://www.tcc.edu/welcome/collegeadm/OfficeOfInternational/GE(epdCoes).htm. Associate of Applied Arts degrees (A.A.A.) and Associate of Applied Science degrees (A.A.S.) are awarded to students majoring in one of the curricula with an emphasis on career and technical coursework. Students pursuing these degrees may plan to seek full-time employment immediately upon graduation from college.

Certificates are awarded to students who complete career and technical education curricula consisting of a minimum of 30 semester credit hours in occupational areas.

Career Studies Certificates are awarded to students who complete career and technical education curricula consisting of 9-29 semester credit hours in occupational areas.

COLLEGE TRANSFER DEGREES
The college transfer degrees include first-year and second-year courses in arts and sciences and pre-professional programs designed to meet standards acceptable for transfer to baccalaureate (four-year) degree programs. TCC transfer courses are designed to be equivalent to those offered at four-year institutions to ensure maximum transferability.

Associate of Arts degrees (A.A.) are awarded to students majoring in liberal arts who may plan to transfer to a four-year college or university after completing their community college program.

Associate of Science degrees (A.S.) are awarded to students majoring in specialized pre-professional programs or programs with a heavy emphasis on general education coursework who may plan to transfer to a four-year college or university after completing their community college program.

The Certificate in General Education program offers students an opportunity to combine courses to meet a subset of lower-level general education requirements needed at a four-year college or university. This program is not intended to meet all lower-level general education requirements and federal financial aid cannot be used for this program.
STATE POLICY ON TRANSFER
In 1991, the State Council of Higher Education for Virginia (SCHEV) and the Virginia Community College System (VCCS) adopted the State Policy on Transfer to ensure transferability of the Associate of Arts and Associate of Science degrees from community colleges. Graduates of TCC's A.A. and A.S. degrees who are accepted into baccalaureate degree programs can expect to be classified as juniors and to have met lower-level general education requirements at public four-year colleges and universities in Virginia. Details on the state transfer policy are available at www.schev.edu.

GUARANTEED ADMISSION AND ARTICULATION AGREEMENTS
Tidewater Community College works with baccalaureate degree-granting institutions to develop articulation agreements to assist TCC students in their transfer. The VCCS also negotiates guaranteed admission agreements (GAA) with four-year institutions. These agreements guarantee admission to qualified students enrolled in any community college in the VCCS.

GAA and articulation agreements apply only to graduates of the degrees designated in the agreements. Students interested in transferring to a four-year institution prior to completing associate degrees must apply through the transfer institution's competitive admissions process, and transferability of course work will be evaluated on a course-by-course basis.

To review these agreements, visit TCC’s website at www.tcc.edu, search keywords: articulation agreement. Additionally, students are advised to consult frequently with advisors or counselors for the most accurate information on transfer and articulation.

TWO-YEAR COLLEGE TRANSFER GRANT
The Two-Year College Transfer Grant Program (CTG) was enacted into law in Virginia in 2007. Under this program, qualified students who complete their associate degrees at Virginia two-year public colleges and then transfer to participating Virginia four-year colleges or universities may receive the CTG award.

For more information, go to www.schev.edu (click on Financial Aid) or the Financial Aid office at your intended four-year transfer institution. Additional information is available from the Virginia Education Wizard at www.vawizard.org/vccs/Transfer.action.

INTERNATIONAL STUDY ABROAD
The International Programs Office coordinates a number of activities that both enhance curriculum and prepare students for a culturally diverse, technologically engaged, and interdependent world. In addition, students have a variety of opportunities during the summer or semester break to study abroad. Additional information is available at www.tcc.edu, search keywords: study abroad.

DEVELOPMENTAL STUDIES
Developmental courses prepare students for admission to the college’s various programs by helping them develop the basic skills and understanding necessary to succeed in college-level courses. Placement testing determines whether students are required to enroll in developmental courses.

ENGLISH AS A SECOND LANGUAGE (ESL)
TCC offers remedial ESL courses to prepare students for college-level courses. ESL consists of four levels: Intermediate I and II, Advanced, and Bridge.

CONTINUING EDUCATION
Continuing Education programs make lifelong learning possible for residents of the college’s service area. These programs include credit and non-credit courses and are offered during day, evening, and weekend hours. For additional information, go to www.tcc.edu/wd.

WORKFORCE SOLUTIONS
Tidewater Community College offers training programs and courses for business, industry, and government clients to ensure their employees have the right knowledge and skills for optimum job performance. TCC’s workforce development programs assist businesses in retaining valuable associates by offering courses at the college’s or client’s on-site location. In addition, the college’s business, industry and government training centers offer customized training, as well as traditional credit courses, certification programs, collaboration services, teleconferencing, and other business-essential services. Call (757) 822-1234 for additional information.

REGISTERED APPRENTICESHIP PROGRAMS THROUGH TCC
TCC is a provider of Apprenticeship Related Instruction (ARI) for students participating in employer-sponsored registered apprenticeship programs. Sponsored programs can range in length from three to five years. In addition to TCC’s long-standing program with the Norfolk Naval Shipyard, TCC’s Apprenticeship Coordinator works with more than 50 sponsors to develop curriculum programs and monitor course offerings and student progress. After completing ARI course work through TCC and on-the-job training provided by the registered employer/sponsor, the apprentice is awarded the journeyman certificate by the Virginia Department of Labor and Industry. For additional information about specific application periods and the programs and types of courses offered through TCC, call (757) 822-1122 or contact the apprenticeship office at (757) 822-1172.
ADMISSION TO THE COLLEGE

GENERAL ADMISSION
Individuals are eligible for admission to Tidewater Community College if they are high school graduates or the equivalent, or if they are 18 years of age or older and are able to benefit academically from study at the college, as demonstrated by assessment in reading, writing, and mathematics. Applicants 18 years of age or older who have not earned a high school diploma or GED, or who received a “Special Diploma” or “Certificate of Program Completion” from a Virginia public high school, may be admitted if they meet minimum assessment scores in reading, writing, and mathematics. Minimum scores are accessible from the college’s website at http://www.tcc.edu/students/admissions/ATB.htm.

Individuals may submit applications in person, by mail, or online at www.tcc.edu. TCC advises all prospective students to consult with counselors or academic advisors to discuss their educational interests and the requirements for admission to specific curricula. Applicants may be admitted as curricular or non-curricular students.

By submitting an application to the college, an applicant makes a voluntary decision to participate in a collegiate experience and abide by the policies, rules, and regulations of TCC and the State Board for Community Colleges. In granting admission to an applicant, the college extends the privilege of joining the college community. Students may remain a part of that community as long as the required academic and behavior standards of the college and the VCCS are met.

Tidewater Community College does not discriminate on the basis of race, sex, color, national origin, religion, sexual orientation, gender identity, age, veteran status, political affiliation, genetics, or disability in its programs or activities. Inquiries related to the college’s nondiscrimination policies may be directed to the Director of Human Resources, Post Office Box 9000, Norfolk, VA 23509-9000, 757-822-1708.

CURRICULAR ADMISSION
Students accepted for general admission who have been admitted to one of the college's academic programs are considered curricular students. Curricular students may be either full-time or part-time students.

Upon admission, all curricular students:

must take placement tests and meet with counselors or academic advisors for interpretation of the test results. Curricular students who score below college level must enroll in appropriate developmental courses and may enroll only in those college credit courses for which they meet developmental prerequisites. Note: Students may submit SAT or ACT results in lieu of taking the college's placement tests if their scores meet or exceed the minimum determined as acceptable. Minimum scores that may qualify a student for exemption are at www.tcc.edu, search keywords: placement testing.

AND

must submit official transcripts from all colleges and universities attended. Graduates who complete secondary school in a home school setting must provide a graduation date and may be required to provide documentation of coursework. (Note: The VCCS Student Information System academic records are sufficient for students transferring coursework within the VCCS.)

AND

may be required to submit additional information with the application to determine admission eligibility or admission to specific curricula.

ADMISSION TO SPECIFIC CURRICULA
Some curricula may specify admission requirements in addition to the college’s general admission requirements. Students who do not meet all program admission requirements may be able to make up deficiencies by successfully completing prescribed developmental courses or other course prerequisites. TCC advises all students to consult with counselors or academic advisors to discuss their educational interests and the requirements for admission to specific curricula.

Admission to the college does not guarantee admission to credit programs with restricted enrollments or competitive admissions requirements. Information on restricted admissions programs is available elsewhere in this catalog, from campus division offices, and at www.tcc.edu/policies.

ADMISSION PRIORITIES
When enrollments must be limited for any curriculum, priority shall be given to all qualified applicants who are residents of the political subdivisions supporting the college and to Virginia residents not having access to the curriculum at their local community college, provided such students meet required prerequisites and apply for admission to the program prior to registration or by a deadline established by the college. In addition, residents of localities with which the college has clinical-site or other agreements may receive equal consideration for admission.

CURRICULUM CHANGES
To change curricula, students should consult with counselors or academic advisors to discuss academic requirements and to make sure that all prerequisites for admission to the new curricula have been met (if applicable). Students must complete Curricula Change Forms, available from Advising and Counseling, on any campus or online using the e-advising service. Students
the Virginia Beach Campus at (757) 822-7342 or visit the ISS office before enrolling at the college. Applicants with disabilities are not required to identify themselves. However, students wishing to request special assistance or academic accommodations because of disabilities or chronic health problems should contact Educational Accessibility at their campus of record 30 days prior to the first day of classes. Students seeking accommodations or program modifications must provide completed documentation of the disability in the form of a report or a letter from a doctor containing detailed information about the disability.

INTERNATIONAL STUDENTS
In addition to the general admission requirements of the college, all international applicants pursuant to F-1 status must meet the admission requirements established by the International Student Services (ISS) office before enrolling at the college. Applicants who have already acquired F-1 status and who are enrolled full-time at other SEVIS approved institutions may be eligible for admission to TCC as transfer students. Contact the ISS office at the Virginia Beach Campus at (757) 822-7342 or visit the ISS office at www.tcc.edu/students/ISS for specific application deadlines and admission procedures to the college pursuant to F-1 status. Applicants in non-immigrant classes other than F-1 are required to meet with the international student advisor to determine admission eligibility and/or limitations.

TRANSFER APPLICANTS
Transfer students who are eligible for re-entrance at the last college of attendance are also eligible for admission to the community college. Transfer students who are ineligible to return to a particular curriculum in a previous college generally may not be allowed to enroll in the same curriculum in TCC until one semester elapses or until an approved preparatory program at the college is completed. The college shall decide on each case and can impose special conditions for the admittance of such students.

SENIOR CITIZENS HIGHER EDUCATION ACT
Any person 60 years or older who has been domiciled in Virginia for a minimum of one year and whose Virginia taxable income is not more than $15,000 qualifies for free tuition benefits for credit classes on a space available basis. Anyone 60 years or older, regardless of income level, who has been domiciled in Virginia for a minimum of one year qualifies for free tuition to audit credit classes or non-credit classes on a space available basis. For further information, contact Enrollment Services on any campus about credit classes, and contact Workforce Development for non-credit classes. Registration dates for credit classes are restricted to those listed in the class schedule. For non-credit classes, registration is available on the first day the class meets.

ADMISSION FOR HIGH SCHOOL AND HOME SCHOOL STUDENTS
High school juniors and seniors and home school students studying at the high school junior or senior levels who meet requirements for participation in the college's dual enrollment programs may be admitted according to the Virginia Plan for Dual Enrollment and Virginia Community College System policy. Although high school and home school students are not normally qualified for general admission, the college may offer admission to those students who meet additional criteria and demonstrate readiness for college. Home school students must provide a copy of a home school agreement approved by the school district or a letter from the local school board or a copy of the letter filed by the parent/legal guardian declaring home school for religious exemption. Documentation of parental permission is required for all dual enrollment students.

Because admitting high school freshmen and sophomores is considered exceptional, the college-ready status of each prospective freshman and sophomore student will be treated on a case-by-case basis and formal approval by the college president is required for admission.
All students admitted under this section must demonstrate readiness for college, as determined by placement testing or acceptable scores on standardized examinations recognized by the college. Eligibility for continued enrollment will be reviewed each term.

Family Educational Rights and Privacy Act (FERPA) regulations may be discussed with applicants and parents to clarify disclosure regulations concerning personally identifiable information.

For additional information regarding admission of high school or home school students, visit http://www.tcc.edu/students/admissions/adm_special.htm.

ADMISSION REFUSAL OR REVOCATION
The college reserves the right to evaluate and document special cases and to refuse or revoke admission if the college determines that applicants or students pose threats, are potential dangers, are significantly disruptive to the college community, or if such refusals or revocations are considered to be in the best interest of the college. The college also reserves the right to refuse admission to applicants who have been expelled or suspended from, or determined to be threats, potential dangers, or significantly disruptive by other colleges.

REAPPLICATION
Students who have interrupted their enrollment at the college for more than three years must reapply by submitting updated Applications for Admission online or to campus Enrollment Services.

CLASSIFICATION OF STUDENTS

CURRICULAR
Curricular students are either full-time or part-time students working toward completion of certificates or associate degrees at the college.

NON-CURRICULAR
Non-curricular students have not requested admission to certificate or associate degree programs or do not meet requirements for curricular status.

FULL-TIME
Full-time students enroll in 12 or more credit hours of coursework in a semester or summer session.

PART-TIME
Part-time students enroll in fewer than 12 credit hours during a semester or summer session.

ACADEMIC LOAD
The minimum full-time academic load is 12 credit hours. The maximum load, without special permission, is 18 credit hours.

STUDENT LEVEL
Students are classified as freshmen until they have completed 30 credits of coursework. Students are classified as sophomores after completing 30 credits of coursework.

CAMPUS OF RECORD
Applicants must select a campus of record—Chesapeake, Norfolk, Portsmouth, or Virginia Beach—when applying for admission. Students may take classes and perform many administrative functions at any of TCC’s four campuses, but students’ records will be maintained at the designated campus of record. Except for students accepted into special admission programs (i.e., Federal Work Study, Health Professions, Trucking, Veterans Affairs) or in situations deemed necessary by the campus Dean of Student Services, students shall not change their campus of record.

PLACEMENT TESTING
Placement Tests are given to evaluate students’ reading, writing, and mathematics skills. Test results are used to assist students in identifying academic strengths and recognizing specific skills that need further development.

The following students are required to take the Placement Test:

- New students entering associate degree or certificate programs
- New students planning to take English, math, or courses with English or math requisites
- Students who do not meet the General Admission requirements
- Non-curricular students who have completed nine or more credit hours and have a grade point average below 2.0

Select students are not required to take the Placement Test. Visit the college website at www.tcc.edu, search keywords: Placement Test.

ENGLISH AS A SECOND LANGUAGE

Placement Testing

Most non-native English speaking students are required to take the English as a Second Language (ESL) Placement Test which includes assessment in reading, listening, and writing. Enrollment in ESL courses indicated by Placement Test scores is required prior to enrolling in college courses. Students must successfully complete all of the required ESL courses before enrolling in other English courses and most other courses. Students who
do not meet minimum scores may not enroll at TCC. These students shall be referred to ESL programs within the community. Upon successful completion, these students can retest for TCC enrollment.

Select non-native English speakers are not required to take the ESL Placement Test and, instead, may take the placement test for native speakers. For more information on ESL Placement Test exemption requirements, visit the college website at www.tcc.edu, search keywords: ESL Placement Test.

REQUIRED ENROLLMENT IN DEVELOPMENTAL COURSES
Admitted students who score below college level on the English Placement Test must enroll in developmental courses and complete them successfully before enrolling in other English or history courses, or courses that require competency in college-level English.

Admitted students who score below college level on the mathematics Placement Test must enroll in developmental courses and complete them successfully before enrolling in other mathematics courses.

Admitted students whose COMPASS/ESL test results indicate the need for ESL instruction must successfully complete the prescribed ESL courses before enrolling in non-ESL courses.

The college reserves the right to withdraw students from classes for which students did not complete the appropriate prerequisites.

ABILITY TO BENEFIT
New students who first enrolled in a curriculum on or after July 1, 2012, and who do not have a high school diploma, GED, or who have not completed a secondary school education in a home-school setting, no longer have the option to demonstrate ability to benefit through placement testing to be eligible for Federal Student Aid. These students are not eligible to receive financial aid from Federal Student Aid programs including the Federal Pell Grant, Federal Supplemental Educational Opportunity Grant, Federal Work Study, Federal Direct Loans, and other programs classified as Title IV.

ORIENTATION
Orientation supports student success by facilitating the transition of new students into the college. All new students should attend an orientation session after taking the Placement Test. For more information and to make orientation reservations, visit TCC’s website at www.tcc.edu, search keyword: orientation.

GENERAL EDUCATION GOALS AND STUDENT LEARNING OUTCOMES

General education is that portion of the collegiate experience that addresses the knowledge, skills, attitudes, and values characteristic of educated persons. It is unbound by disciplines and honors the connections among bodies of knowledge. TCC degree graduates will demonstrate competency in the following general education areas:

1. Communication
A competent communicator can interact with others using all forms of communication, resulting in understanding and being understood. Degree graduates will demonstrate the ability to:
   - understand and interpret complex materials;
   - assimilate, organize, develop, and present an idea formally and informally;
   - use Standard English;
   - use appropriate verbal and non-verbal responses in interpersonal relations and group discussions;
   - use listening skills; and
   - recognize the role of culture in communication.

2. Critical Thinking
A competent critical thinker evaluates evidence carefully and applies reasoning to decide what to believe and how to act. Degree graduates will demonstrate the ability to:
   - discriminate among degrees of credibility, accuracy, and reliability of inferences drawn from given data;
   - recognize parallels, assumptions, or presuppositions in any given source of information;
   - evaluate the strengths and relevance of arguments on a particular question or issue;
   - weigh evidence and decide if generalizations or conclusions based on the given data are warranted;
   - determine whether certain conclusions or consequences are supported by the information provided; and
   - use problem solving skills.

3. Cultural and Social Understanding
A culturally and socially competent person possesses an awareness, understanding, and appreciation of the interconnectedness of the social and cultural dimensions within and across local, regional, state, national, and global communities. Degree graduates will demonstrate the ability to:
   - assess the impact that social institutions have on individuals and culture—past, present, and future;
   - describe their own as well as others’ personal ethical systems and values within social institutions;
   - recognize the impact that arts and humanities have upon individuals and cultures;
• recognize the role of language in social and cultural contexts; and
• recognize the interdependence of distinctive world-wide social, economic, geopolitical, and cultural systems.

4. Information Literacy
A person who is competent in information literacy recognizes when information is needed and has the ability to locate, evaluate, and use it effectively. Degree graduates will demonstrate the ability to:
• determine the nature and extent of the information needed;
• access needed information effectively and efficiently;
• evaluate information and its sources critically and incorporate selected information into his or her knowledge base;
• use information effectively, individually, or as a member of a group to accomplish a specific purpose; and
• understand many of the economic, legal, and social issues surrounding the use of information and access and use information ethically and legally.

5. Personal Development
An individual engaged in personal development strives for physical well-being and emotional maturity. Degree graduates will demonstrate the ability to:
• develop and/or refine personal wellness goals; and
• develop and/or enhance the knowledge, skills, and understanding to make informed academic, social, personal, career, and interpersonal decisions.

6. Quantitative Reasoning
A person who is competent in quantitative reasoning possesses the skills and knowledge necessary to apply the use of logic, numbers, and mathematics to deal effectively with common problems and issues. A person who is quantitatively literate can use numerical, geometric, and measurement data and concepts, mathematical skills, and principles of mathematical reasoning to draw logical conclusions and to make well-reasoned decisions. Degree graduates will demonstrate the ability to:
• use logical and mathematical reasoning within the context of various disciplines;
• interpret and use mathematical formulas;
• interpret mathematical models such as graphs, tables and schematics, and draw inferences from them;
• use graphical, symbolic, and numerical methods to analyze, organize, and interpret data;
• estimate and consider answers to mathematical problems in order to determine reasonableness; and
• represent mathematical information numerically, symbolically, and visually, using graphs and charts.

7. Scientific Reasoning
A person who is competent in scientific reasoning adheres to a self-correcting system of inquiry (the scientific method) and relies on empirical evidence to describe, understand, predict, and control natural phenomena. Degree graduates will demonstrate the ability to:
• generate an empirically evidenced and logical argument;
• distinguish a scientific argument from a non-scientific argument;
• reason by deduction, induction, and analogy;
• distinguish between causal and correlational relationships; and
• recognize methods of inquiry that lead to scientific knowledge.

CREDIT FOR OTHER EDUCATION AND EXPERIENCE
TRANSFERRING FROM OTHER COLLEGES
Normally, transfer students who are eligible for re-entrance at the last college they attended are also eligible for admission to Tidewater Community College. Students who are not eligible to return to a previous college may not be permitted to enroll at TCC.

Currently enrolled curricular students may request a transcript evaluation for the purpose of receiving transfer credit for course work completed elsewhere. Credit is awarded based on students’ curricula and enrollment status. Grades and grade point averages do not transfer to TCC, and students must earn a C or higher in courses for possible transfer. Students requesting an evaluation of previous coursework for credit must have official transcripts, with appropriate college seals and authentication, sent directly from each institution attended to:
TCC Office of the College Registrar
P. O. Box 9000
Norfolk, VA 23509-9000

Students must also submit an online Request for Evaluation of Educational Experience form at www.tcc.edu, search keywords: evaluation request. For more information, contact the Office of the College Registrar or visit TCC’s website at www.tcc.edu, search keywords: transfer credit.

Credit awarded for one curriculum may not apply to a new curriculum, and a re-evaluation of transfer credits may be necessary. Students seeking a re-evaluation of credits after officially changing their curricula may do so by completing a new online Request for Evaluation form.
TRANSCRIPTS FROM INSTITUTIONS OUTSIDE THE U.S.
Transfer credit may be awarded for course work completed at international colleges and universities that are accredited or approved by the appropriate Ministry of Education or other governmental agency. Course work must be evaluated by one of the professional organizations or agencies approved by the Virginia Department of Education and listed as a member of the National Association of Credential Evaluators.

For additional information, visit TCC’s website at www.tcc.edu, search keywords: foreign transcript.

TRANSFER CREDIT APPEALS PROCEDURE
The Office of the College Registrar notifies students via their VCCS student email accounts when the evaluation of transfer credits is completed. Students may appeal decisions regarding the transferability of specific courses or the applicability of specific courses to requirements in the curriculum. To initiate appeals, students should direct a letter along with supporting documentation to the dean or director whose division offers the course within 15 business days of official notification of transcript evaluation results. Specific information on the transferability of credit and procedures for appealing transfer credit decisions is available from Advising and Counseling on the TCC website at www.tcc.edu, search keywords: transfer appeal.

ADVANCED STANDING CREDIT
TCC awards credit for many standardized examinations, training provided by non-collegiate institutions, such as armed forces and service schools, professional certifications, and experiential learning. Advanced Standing credit is awarded as determined by qualified faculty members at the college and according to procedures and standards approved by those qualified faculty ensuring that assessment procedures are appropriate for the credit awarded. Credit is awarded only as required by a student's curriculum.

Advanced Standing credit may only be awarded to matriculated students who are in “active attendance” at the college. A student in “active attendance” is defined as one who has completed or is enrolled in one or more credit hours at the college after the current semester's regular deadline for dropping a course with a tuition refund. Advanced standing credit shall not be awarded for a previously enrolled course.

TCC awards Advanced Standing credit applicable to a student’s program of study. Regardless of the credit hours earned through Advanced Standing, the student must meet the residency requirements for the selected program of study, which means that a minimum of 25% of the total number of credits for any degree or certificate must be earned at TCC.

When credit is awarded for Advanced Standing, student records shall reflect Advanced Standing credit and the applicable source. When credit is awarded for Advanced Standing, no letter grade is assigned on the student's transcript; and hours earned from credit are not used in computing the grade point average.

Credits earned through Advanced Standing are not counted as part of the student’s academic load when full-time or part-time status is reported to the Financial Aid office or to an external party such as the Social Security Administration, an employer, health insurance carrier, the Immigration and Naturalization Service, or the Department of Veterans Affairs. Tidewater Community College assumes no responsibility regarding the acceptance of Advanced Standing credit by other institutions to which the student may transfer.

For additional information, visit TCC’s website at www.tcc.edu, search keyword: registrar.

CREDIT BY STANDARDIZED EXAMINATION
The college awards credit for acceptable scores, in accordance with Virginia Community College System policy, for the College Level Examination Program (CLEP), Advanced Placement (AP), the International Baccalaureate (IB) program, the Cambridge Advanced Program, Excelsior College/UEXCEL, DANTES DSST, the Defense Language Proficiency Test (DLPT), the College Entrance Examination Board (CEEB), and other approved third-party examinations.

All test scores must be sent directly from the testing agency to:
TCC Office of the College Registrar
P. O. Box 9000
Norfolk, VA 23509-9000

In addition to official score reports, students must submit online Request for Evaluation forms at www.tcc.edu, search keywords: evaluation request. For more information, contact Advising and Counseling on any campus. For score requirements and additional information, visit TCC’s website at www.tcc.edu, search keyword: registrar.

CREDIT BY LOCAL EXAMINATION
Credit by local examinations is a means of achieving academic credit for coursework through satisfactorily demonstrating subject-matter competency through an examination developed, administered, and evaluated by college faculty. Credit shall not be awarded for a course previously enrolled in, and examinations can only be attempted once. Local examinations are not appropriate for all courses and are developed by faculty with approval from an academic dean. Students must earn a “C” (70%) or better on the examination and obtain approval from the evaluating faculty member and academic dean to earn academic credit for the course.
CREDIT THROUGH TRAINING BY NON-COLLEGIATE INSTITUTIONS
The college awards credit for applicable armed service school experiences, non-collegiate institutions, and earned professional certifications and licenses. Where applicable, credit shall be awarded in accordance with The American Council on Education’s College Credit Recommendation Service (CREDIT), the ACE Guide to the Evaluation of Educational Experiences in the Armed Services, the National College Credit Recommendation Service (NCCRS), or other approved organizations.

Requests by students can be made to the discipline dean/director after consulting with a faculty member or program head. For more information, see TCC’s website at www.tcc.edu, search keyword: registrar.

CREDIT THROUGH EXPERIENTIAL LEARNING
Experiential Learning Credit is a means of achieving Advanced Standing credit through occupational experience determined by the college to be equivalent to the course(s) to be exempted. Students may obtain learning through work, volunteer activities, and participation in civic assignments; travel; independent study; and similar life experiences that are demonstrated through the submission of a portfolio that documents achievement of course learning outcomes.

A student seeking Experiential Learning Credit should consult a TCC academic dean to determine if portfolio credit is an appropriate option given curriculum and academic and professional goals.

Contact the appropriate campus dean or an academic advisor or counselor for more information or visit the college website at www.tcc.edu, search keywords: registrar.

SUBSTITUTION OR WAIVER OF CURRICULUM REQUIREMENTS
Students who want to substitute previously completed credit courses or to use documented knowledge and skills to waive courses required in their curricula must:

• Gather documented evidence or justification (e.g., course syllabus, catalog course description) in support of the requests, and consult counselors or academic advisors.

• Complete Student Request for Requisite Approval forms.

• If advised, submit the completed forms to the appropriate academic deans for approval.

Substituted courses must cover the same content or otherwise meet the spirit of the courses being replaced. Course substitutions granted are curriculum specific and may not apply to other curricula. Waivers do not result in the awarding of credit, and students may be required to take additional credits to make up the credits by completing additional courses. For additional information, visit TCC’s website at www.tcc.edu, search keywords: course substitution.

SERVICEMEMBERS OPPORTUNITY COLLEGES
Tidewater Community College is an institutional member of Servicemembers Opportunity College (SOC), a group of approximately 1,800 colleges and universities providing voluntary post-secondary education to members of the military throughout the world. Additionally, TCC is one of approximately 150 colleges and universities selected to participate in the SOC Degree Network System (DNS). Both of these programs help assure the ease of transfer of course credits and earned degrees among member institutions, providing those on active duty, the National Guard, Reservists, their families, and veterans greater course and degree mobility should they find it necessary to transfer to another duty or work station.

Within the framework of SOC, TCC actively participates in the following programs: SOCAD (available for Air Force, Army, Army Reserve, and National Guard personnel); SOCPNAV (available for Naval and Marine personnel); and SOCGMAST (available for U.S. Coast Guard personnel). The college also participates in the Concurrent Admissions Program (CONAP) offered by SOC in cooperation with the U.S. Army or the U.S. Army Reserve. Students participating in these programs should apply for the applicable SOC contract.

For more information or to request an official SOC evaluation, contact the Center for Military and Veterans Education (CMVE). eLearning students may contact CMVE advisors through dedicated toll free lines at 888-227-6289; or for international calls at 855-399-7480. Local students may contact the CMVE at the Virginia Beach Campus at 757-822-7777 or 757-627-6289. The CMVE SOC Coordinator may also be contacted directly via email at vbsoc@tcc.edu or, if Navy, at Navy@tcc.edu.

REGISTRATION INFORMATION
ACADEMIC CALENDAR
The college produces an academic calendar that includes registration dates, class start dates, add/drop deadlines, tuition deadlines, and more. The academic calendar is maintained on the college’s website at www.tcc.edu, search keywords: academic calendar.

ENROLLMENT
To take courses at TCC, students may register in a variety of ways:

• online, using the Student Information System (www.tcc.edu/sis),

• in person at any campus or off-campus enrollment site, or

• by mail or fax, sending materials according to the instructions and deadlines listed on TCC’s website.
Currently enrolled students in good academic and financial standing at the college should consult counselors or academic advisors prior to the enrollment period to determine which classes to take.

Students with academic blocks on their records due to academic suspension or dismissal may not register until granted readmission. Students with administrative blocks on their records—holds resulting from unpaid library charges, financial aid overpayments, or other student debts to the college—may not register until their balances are paid and their records are cleared.

Students are encouraged to enroll prior to the first day of classes. Students who add classes or register after the first day of classes are counted absent from class meetings missed as a result of late registration.

Complete enrollment procedures are outlined on the TCC website, and assistance is available on each campus in the Enrollment Services Office. For additional information, visit TCC’s website at www.tcc.edu, search keyword: enrollment.

**COURSE REQUISITES**
Prerequisites are courses or other requirements that must be successfully completed prior to enrollment in other courses. Co-requisites are courses or other requirements that must be taken simultaneously with other courses, unless the co-requisites were completed previously. Requisites are listed in the course description section of this catalog and the college’s curriculum portal (www.tcc.edu/iincurr), and may include developmental courses identified through placement testing. The college’s Student Information System (SIS) may block students from registering for courses if the requisites have not been met. Students who believe they have satisfied requisites, but are blocked from registering should consult counselors or academic advisors for assistance. The college reserves the right to withdraw students from courses in which they have enrolled without successfully completing the appropriate requisites.

**ACADEMIC LOAD**
The full-time course load is 12 to 18 credit hours. Students should consult counselors or academic advisors to plan academic loads that will be compatible with their work schedules, family responsibilities, health, and other obligations. As a rule, one credit hour of coursework requires at least two hours of study outside of class each week.

Students who wish to take more than 18 credit hours of course work in a session must obtain the approval of the campus dean of student services or designee.

Students who are on academic warning or academic probation should meet with counselors or academic advisors and may be required to take reduced course loads for the next semester.

**MINIMUM ENROLLMENT REQUIREMENT**
Each course is offered on the condition of adequate enrollment. The college reserves the right to cancel or discontinue any course offered, either because of inadequate enrollment or for any other reason deemed appropriate by the college.

**AUDITING COURSES**
To audit courses (attend classes without taking examinations or receiving credits), students must obtain permission from the appropriate academic deans or designees on the campuses where the courses are taught. Students must then register and pay full tuition.

To change the status of courses from audit to credit, or from credit to audit, students must complete the changes by the deadline to add courses during the term’s regular session (i.e., 16-week sessions in the fall and spring semesters and 10-week session during the summer term).

Audited courses do not carry credits and are not counted as part of the academic load when full-time or part-time status is reported to the Financial Aid Office or to external parties such as the Social Security Administration, an employer, health insurance carrier, the Immigration and Naturalization Service, or the Department of Veterans Affairs. Advanced standing credit will not be awarded for audited courses.

**CHANGE OF REGISTRATION**
Students must follow established procedures for making any changes to their course schedules or curricula. Changes are not official until students complete all required procedures online, in person, or by providing written permission to a representative authorized to act on their behalves. To prevent problems with permanent college records, financial aid status, or veterans’ benefits, students are encouraged to consult counselors or academic advisors before making changes to their enrollment.

**TYPES OF CHANGES**
The deadlines for adding and dropping courses and withdrawing without academic penalty from regular session courses are published every semester in the college’s academic calendar. Adding means enrolling in new courses during the published add/ drop period. Students may need special permission from provosts or designees to add courses after the first class meetings.

Dropping means officially cancelling registration for courses on or before the last drop date and allows for tuition refunds. Enrollment in dropped courses will not appear on academic records, and students will not receive grades for the dropped courses.

Contact Enrollment Services for the last date to withdraw from dynamic courses (courses which are shorter than the 16-week session during fall and spring or the 10-week session in the summer).
COURSE WITHDRAWAL

Withdrawing from courses means students officially leave courses after the refund period. Students may withdraw from courses without academic penalty after the last day to drop for tuition refunds and during the first 60 percent of a session and receive grades of W (withdrawal). This grade will be reflected on students’ permanent records. The last day to withdraw without academic penalty is published in TCC’s academic calendar. Dynamic session classes have unique withdrawal dates. Contact Enrollment Services for the last day to withdraw. After the last day to withdraw without academic penalty, students will receive failing grades of F or U if they withdraw or are administratively withdrawn from courses. The college reserves the right to withdraw students for just cause.

Exceptions to this policy may be made if all of the following conditions are met:

• Instructors initiate withdrawals approved by academic deans.
• Students are able to document mitigating circumstances.
• Students were making satisfactory progress in the courses.

Students should not stop attending college without officially withdrawing from all classes. Failure to properly withdraw from the college may result in the assignment of F or U grades to the permanent records. Students should meet with counselors or academic advisors to consider options before withdrawing from courses.

EFFECTIVE DATE OF OFFICIAL COLLEGE AND COURSE WITHDRAWAL

When students withdraw from classes or from the college, the official withdrawal date is the date on which the request is processed by the college, not the last day of the last class attended or last date of participation for online courses, unless the two dates are the same. If students are administratively withdrawn from courses, the official withdrawal date is the last day the students attended or participated in class, as reported by the instructors.

TUITION AND FEES

Tuition and fee rates may be viewed on the college website at www.tcc.edu, search keyword: tuition.

ACADEMIC REGULATIONS

COURSE CREDITS

The semester hour credit for each course is listed in the course description of this catalog.

Each semester hour of credit given for a course is based on one academic hour (50 minutes) of formalized, structured instructional time per week for 15 weeks. This totals 750 minutes of instruction. In addition, each course requires an examination/evaluation period. Courses may consist of lectures, out-of-class study, online study, laboratory and/or shop study, or combinations thereof, with credit awarded as follows:

• Lecture: One academic hour of lecture (including lecture, seminar, discussion or other similar activities) per week for 15 weeks, plus the examination/evaluation period equals one collegiate semester-hour credit.
• Laboratory: Two to five academic hours (depending on the discipline) of laboratory, clinical training, supervised work experience, coordinated internship, or other similar activities per week for 15 weeks, plus the examination/evaluation period equals one collegiate semester-hour credit.
• Asynchronous eLearning Courses: Traditional contact hours combined with learning activities in which students and faculty are separated by time and place; content is equivalent to that of traditional lecture/laboratory classes.

COURSE NUMBERING

Courses numbered less than 100 are not applicable toward associate degree programs. Some developmental courses, with the approval of the Vice President for Academic Affairs and Chief Academic Officer (or designee), may provide credit applicable to certificate programs. These courses may not qualify for federal financial aid.

Courses numbered 100 through 299 are freshman and sophomore courses typically applicable toward associate degree and certificate programs.

GRADING SYSTEM

The quality of performance in any academic course is reported by a letter grade, which the instructor is responsible for assigning.

The grades of A, B, C, D, P and S are passing grades. Grades of F and U are failing grades. R and I are interim grades. Grades of W and X are final grades carrying no credit.

P - PASS

No grade point credit. This grade applies only to non-developmental specialized courses and seminars approved by the appropriate academic dean. A maximum of seven semester credit hours with a P grade may be applied toward a degree or certificate.

S - SATISFACTORY

No grade point credit. The grade of S indicates satisfactory completion of course objectives in developmental studies and ESL courses.
U - UNSATISFACTORY
No grade point credit. The grade of U is assigned when the student has not made satisfactory progress in developmental studies, ESL courses, or courses taken on a Pass/Unsatisfactory basis.

R - RE-ENROLL
No grade point credit. The R grade may be used as a grade option, in developmental and ESL courses only, when the student has made satisfactory progress but has not completed all of the instructional objectives for developmental studies or ESL courses. Students must re-enroll in the course and pay the specified tuition to complete the course objectives.

W - WITHDRAWAL
No grade point credit. A grade of W is awarded to students who withdraw or are withdrawn from a course after the add/drop period but prior to the completion of 60 percent of the session. After that time, the student will receive a grade of F except under mitigating circumstances, which must be approved by the course instructor and the appropriate academic dean. A copy of the withdrawal form and supporting documentation will be placed in the student’s academic file.

X - AUDIT
No credit. Permission from the appropriate academic dean or designee is required to audit a course. Students must register through the usual registration process and pay the normal tuition. Audited courses do not count as part of a student’s course load. Students desiring to change status in a course from audit to credit or from credit to audit must do so within the add/drop period for the course. Students who desire to earn credit for a previously audited course must re-enroll in the course for credit and pay normal tuition to earn a grade other than X. Advanced standing credit shall not be awarded for a previously audited course.

I - INCOMPLETE
No credit. The grade of I is used only for verifiable unavoidable reasons that a student is unable to complete a course within the normal course time. To be eligible to receive an I grade, the student must (1) have satisfactorily completed more than 60% of the course requirements and attendance and (2) request the faculty member to assign the I grade and indicate why it is warranted. The faculty member has the discretion to decide whether the I grade will be awarded. Since the “incomplete” extends the enrollment in the course, requirements for satisfactory completion shall be established through student/faculty consultation. In assigning the I grade, the faculty member must complete documentation that (1) states the reason for assigning the grade; (2) specifies the work to be completed and indicates its percentage in relation to the total work of the course; (3) specifies the date by which the work must be completed; and (4) identifies the default grade (B, C, D, F, P, R, or U) based upon course work already completed. Completion dates may not be set beyond the last day of the subsequent semester (to include summer session) without written approval of the campus provost. The student will be provided a copy of the documentation.

The instructor must submit a Grade Change form to change the I grade to the grade earned after course work is completed. If the work is not completed on time, another grade (B, C, D, F, P, R, or U) must be assigned based on the course work already completed. An I grade will be changed to a W only under documented mitigating circumstances, which must be approved by the campus provost. A copy of the withdrawal form and supporting documentation will be placed in the student’s academic file.

COMPUTING THE GRADE POINT AVERAGE (GPA)
To determine a cumulative grade point average, divide the total number of grade points earned in all courses attempted by the total number of credits attempted. Grades that do not generate grade points, such as credits for developmental courses, are not included in the calculation of credits attempted. Grades of P (pass), R (re-enroll), S (satisfactory), U (unsatisfactory), and W (withdrawal), I (incomplete), or X (audit) do not receive grade points.

SEMMESTER GPA
To determine a semester GPA, divide the total number of grade points earned in all courses taken in a given semester by the total number of credits attempted for the semester.

CURRICULUM GPA
To determine a curriculum GPA, divide the total number of grade points earned in all courses applicable to the student’s curriculum by the total number of credits attempted in courses applicable to that curriculum.

CUMULATIVE GPA
To determine a cumulative grade point average, divide the total number of grade points earned in all courses by the total number of credits attempted.

See Repeated Course Policy below for information on calculating GPA for non-developmental courses taken more than once.

REPEATED COURSE POLICY
Beginning with the fall semester 1996, only the most recent attempt of a repeated course is used to calculate the cumulative GPA, and only credits earned in the most recent attempt are counted toward meeting curriculum requirements. Grades earned during previous attempts remain on the permanent records of students. Note: This policy applies only to courses first attempted in the summer 1988 or later, and does not affect GPA adjustments made for courses completed and repeated under the previous repeat policy (summer 1994 - summer 1996).
Some courses are exempt from consideration as repeats and an adjustment to GPA is not made. Exempted courses are those numbered in the 90s, 93s, 95s, 96s, 97s, 98s, and 99s; courses identified by the phrase “may be repeated for credit”; and selected other courses. Periodically, the VCCS will rename or renumber courses, but they remain equivalent to the courses as previously named or numbered. In such cases, completion of a renumbered/renamed course may be determined to be a repeat of a course completed previously under a different department and/or course number. These determinations are made on a college-wide basis, and exceptions cannot be made for individual students.

Implementation of this policy does not affect GPA calculations for prior terms or academic, financial, or administrative events that have occurred in the past. Direct any questions to the coordinator of Enrollment Services.

LIMIT ON REPEATING A COURSE
Students are limited to two attempts in the same credit or developmental course for the purpose of improving their grades. (Grades of A, B, C, D, F, I, P, R, S, U, X and W count as attempts.) The appropriate academic dean must approve exceptions to this policy. This limitation does not apply to certain courses identified as repeatable for credit.

The process for appealing final course grades is outlined in the Student Handbook.

EXAMINATIONS
Students are expected to take examinations as scheduled by their instructors. No exceptions will be made without permission of instructors and academic deans.

COURSE ATTENDANCE
Students should be present and on time for all scheduled class and laboratory meetings. Instructors do not have to admit students who arrive late. If students add classes or register after the first day of classes, the students are counted absent from all class meetings missed.

If students are absent more than 15 percent of scheduled instructional time, attendance may be defined as unsatisfactory. This calculation includes absences occurring during the add/drop period.

Instructors may establish more stringent attendance policies, and students are responsible for understanding the attendance requirements for each course in which they are enrolled.

When instructors determine student absences constitute unsatisfactory attendance, students may be withdrawn from courses. Students will receive W grades during the first 60 percent of courses. If students are withdrawn after 60 percent of courses, grades of F (or U in the case of developmental courses) will be assigned unless students can document mitigating circumstances. Students who are withdrawn from courses because of unsatisfactory attendance are not eligible for refunds of tuition and fees.

ACADEMIC STANDING
Students are considered to be “in good academic standing” if they maintain semester minimum GPAs of 2.00, are eligible to re-enroll at the college and are not on academic suspension or dismissal status.

ACADEMIC WARNING
Students who fail to attain minimum GPAs of 2.00 for any semester shall be placed on academic warning. Students on academic warning should consult with counselors or academic advisors and take advantage of academic support services provided by the college.

ACADEMIC PROBATION
Students who fail to maintain cumulative GPAs of 1.50 after attempting 12 or more semester credits shall be on academic probation until their cumulative averages are 1.75 or better.

The statement “Academic Probation” will appear on the students’ permanent records. Students on academic probation are ineligible for appointive or elective offices in student organizations unless special permission is granted by the campus Dean of Student Services. Students must consult counselors or academic advisors before registering and usually are required to carry reduced course loads the next semester.

Note: Although cumulative GPAs between 1.5 and 1.99 may not result in formal academic probation, students must earn a minimum of 2.0 in their curricula to receive associate degrees or certificates.

ACADEMIC SUSPENSION
Students on academic probation who fail to earn minimum semester GPAs of 1.50 shall be placed on suspension only after they have attempted 24 or more semester credits.

The statement “Academic Suspension” will appear on the students’ permanent records. Academic suspension shall be for one semester. Suspended students may appeal and be reinstated at the conclusion of the suspension period by submitting Applications for Readmission available online or from campus Enrollment Services. Readmission applications should be submitted to Advising and Counseling for review.

Following reinstatement after academic suspension, students must earn minimum 2.0 GPAs for the semester in which they return, and minimum GPAs of 1.75 in all subsequent semesters.
for which they are enrolled. The statement “Subject to Dismissal” shall be placed on students’ permanent records. Students who have been reinstated from academic suspension will remain subject to dismissal until their cumulative GPAs are raised to a minimum of 1.75. Reinstated students may be required to carry reduced course loads the following semester and are required to consult with counselors or academic advisors.

ACADEMIC DISMISSAL

Students who do not attain at least 2.00 GPAs for the semester of reinstatement following academic suspension shall be academically dismissed. Students who achieve at least 2.00 GPAs for the semester of their reinstatement following academic suspension must earn at least 1.75 GPAs in all subsequent semesters of enrollment. Failure to attain 1.75 GPAs in each subsequent semester until the cumulative GPAs reach 1.75 shall result in academic dismissal.

The statement “Academic Dismissal” will appear on the permanent records of students. Academic dismissal is normally permanent. In exceptional circumstances, students may appeal and be reinstated by submitting Applications for Readmission available online or from campus Enrollment Services. Readmission applications should be submitted to Advising and Counseling for review. Students who have been reinstated after academic dismissal will remain subject to dismissal until their cumulative GPAs are raised to a minimum of 1.75. Reinstated students may be required to carry reduced course loads the following semester and are required to consult with counselors or academic advisors.

ACADEMIC RENEWAL POLICY

Students who return to the college after a separation of five years or more (i.e., 60 months or greater) may petition for academic renewal by submitting Academic Renewal Petition Forms to Enrollment Services.

If students meet eligibility requirements for academic renewal, D and F grades earned prior to re-enrollment are not calculated into the cumulative and curricula GPAs, subject to the following conditions:

- Prior to petitioning for academic renewal, students must demonstrate renewed academic interest and effort by earning at least 2.5 GPAs in the first 12 semester hours completed after re-enrollment.
- All grades received at the college will remain a part of the students’ permanent records.
- Students will receive degree credits only for courses in which grades of C or better were earned prior to academic renewal, providing that such courses meet current curricula requirements.
- Total hours for graduation will be based on all course work taken at the college after readmission, as well as former course work for which grades of C or better were earned and credits transferred from other colleges or universities.
- Students may use the academic renewal policy only once, and it cannot be revoked once approved. The notice “Academic Renewal has been granted” and the effective dates will appear on official transcripts.

HONORS

PRESIDENT’S HONOR ROLL

Students who have earned a minimum of 20 hours of credit at the college will be included on the president’s honor roll for each semester that their cumulative grade point averages are 3.5 or higher.

DEAN’S LIST

Students who carry a minimum of 12 credit hours per semester will be included on the dean’s list for each semester in which they earn grade point averages of 3.2 or higher.

GRADUATION HONORS

Students who have fulfilled the requirements for AA, AS, AAA, AAS, and one-year certificate programs are eligible for graduation honors, based on the minimum cumulative grade point averages listed below. Honors are not awarded for career studies certificates.

- 3.2 Cum laude (with honor)
- 3.5 Magna cum laude (with high honor)
- 3.8 Summa cum laude (with highest honor)

GRADUATION REQUIREMENTS

Students are responsible for fulfilling all graduation requirements and meeting all conditions listed below:

- Fulfill all of the course and credit hour curricula requirements with a minimum of 25 percent of the credit hours earned in coursework taken at TCC;
- Earn GPAs of at least 2.0 in all studies completed that are applicable toward graduation in the curricula;
• Submit Applications for Graduation by the college’s published deadline. Applications are available online at www.tcc.edu, search keyword: graduation;

• For curricula consisting of more than 45 credit hours, satisfy computer competency requirements. Students with disabilities that may affect achieving and documenting computer competencies should contact the Educational Accessibility representative at their campus of record. Successful completion of computer competency tests does not carry any academic credit. For information on how to satisfy the computer competency requirement, see www.tcc.edu, search keywords: computer competencies;

• Resolve all financial obligations to the college and return all learning resources and other college materials; and

• Be certified by appropriate college officials for graduation.

CATALOG DETERMINATION AND DEGREE DESIGNATION
The catalog year used to determine graduation requirements is the one in effect at the time students are admitted to the curricula from which they plan to graduate, provided the catalog is not more than six years old (including the year in which students plan to graduate). Students may choose to graduate under the requirements listed in any subsequent catalog as long as it is not more than six years old (including the year in which they plan to graduate).

Only degree titles appear on diplomas when awards are conferred. Degree majors and specializations, if any, appear on the students’ permanent records (transcripts). Multiple specializations within a degree appear on transcripts, provided students meet the additional requirements and apply to receive multiple specializations.

In awarding students additional degrees, certificates or career studies certificates, the college may grant credit for all completed, applicable courses which are requirements of the additional degrees, certificates, or career studies certificates. However, the awards must differ from one another by at least 25% of the credits.

STUDENT OUTCOMES ASSESSMENT REQUIREMENT
As a part of the college’s efforts to improve institutional effectiveness, students may be required to take tests or complete surveys designed to measure student learning in general education or selected majors prior to graduation. Work products submitted by students to fulfill course requirements may also be collected and evaluated. These assessment activities evaluate the college’s academic programs and general education requirements. Test results are confidential and aggregated across curricula. No minimum score or level of achievement is required for graduation.

COMMENCEMENT
The college holds commencement ceremonies for students who meet graduation requirements for degree and certificate programs. Attendance at a commencement ceremony is strongly encouraged.

COLLEGE RECORDS POLICIES

STUDENT ADDRESS OF RECORD
The college sends official communications to the addresses students provide to campus Enrollment Services, or to student VCCS/TCC e-mail accounts. To make address changes, students must complete and submit Student Data Change forms to a campus Enrollment Services Office or may make the change through the college’s Student Information System (SIS).

FINAL GRADE REPORTS
Final grades for each semester or term become a part of students’ permanent records and are recorded on official transcripts. Grade reports are available to students via the college’s website (www.tcc.edu) through the Student Information System (SIS).

TRANSCRIPTS AND CERTIFICATIONS
Transcripts are copies of students’ permanent academic records. To receive personal copies of their transcripts or to send official copies of their transcripts elsewhere, students must submit requests online. Transcripts sent to educational institutions or agencies must be official and bear the college seal. Generally, transcripts given or mailed directly to students are not considered official. Students must settle all financial obligations with the college before transcripts will be released. Visit www.tcc.edu, search keyword: transcripts, for options for requesting official transcripts or for instructions on printing an unofficial transcript from the Student Information System (SIS).

Certifications are letters or forms verifying student enrollment status for health and auto insurance companies, military IDs, scholarships, job applications, promotion packages, etc. These requests normally take seven to fourteen working days or longer to process during heavy registration periods or grade processing times. Students must settle all financial obligations with the college before certifications will be released. Contact the campus Enrollment Services Office to request certifications.

Students must present picture IDs to pick up transcripts or certifications. Third parties may pick up transcripts or certifications, but only if students have provided the college written permission, dated and signed by the students, to release documents to specific individuals. The specified individuals must present their picture IDs.
Contact campus Enrollment Services for information and assistance with transcripts and certifications.

**HOLD ON RECORDS**

Students whose records are put on hold will not be permitted to register, nor will the college issue transcripts, certificates, or degrees to students until all their financial obligations to the college have been settled.

**FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT (FERPA)**

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. TCC’s policy governing student rights to access, challenge the accuracy of, or request release of the education record and grades is provided within the Student Handbook and on TCC’s website at www.tcc.edu, search keyword: FERPA.

**STUDENT RECORDS RETENTION POLICY**

Transcripts are official documents of student academic history and are used for record reconciliation. All other student documents are subject to disposal by the college in accordance with state policy.

**WEAPONS AND FIREARMS**

Possession or carrying of any weapon by any person, except a law-enforcement officer, is prohibited on college property in academic buildings, administrative office buildings, student centers, child care centers, dining facilities, and places of like kind where people congregate, or while attending any sporting, entertainment or educational events.

Any individual in violation of this prohibition shall be directed to remove the weapon immediately. Failure to comply may result in a student conduct referral, an employee disciplinary action, or arrest.

These prohibitions shall not apply to current sworn and certified local, state and federal law-enforcement officers with proper identification. Additionally, the college has authorized the armed guards of the armored transport company that services the college’s business offices to carry their weapons while performing their contracted responsibilities.

The college’s Policy 1101 (Weapons) is available online at www.tcc.edu/policies/1000/1101Weapons.pdf.

**CURRICULAR REQUIREMENTS**

**A.A./A.S. DEGREES**

In selecting courses, students are expected to follow curricula guides for their intended majors and specializations. Students who plan to transfer to four-year colleges or universities are urged to acquaint themselves with the requirements of the institutions and major departments to which they intend to transfer. With careful planning, students may be able to meet both general education requirements and prerequisites for majors with the same courses, allowing greater flexibility in selecting electives. Students should consult counselors or academic advisors to select courses most appropriate for their curricula. Many TCC courses are transferable as general electives even if they do not fulfill core requirements.

**A.A.A./A.A.S. DEGREES AND CERTIFICATES**

In selecting courses, students are expected to follow the curricula guides for their intended majors and specializations. Where appropriate, students may select courses from lists of approved courses provided by their division office to meet requirements in the degrees or certificates. While general education courses other than those designed specifically for transfer may be used to meet portions of the general education requirements, principles published by the Southern Association of Colleges and Schools...
Commission on Colleges require that general education courses be general in nature and not “…narrowly focused on those skills, techniques, and procedures peculiar to a particular occupation or profession.” A.A.S./A.A. degrees generally are not designed for transfer, but students can increase the transferability of selected applied degrees by substituting transfer courses where appropriate to meet program requirements.

GENERAL EDUCATION CORE REQUIREMENTS
All Tidewater Community College students earning a degree or certificate must complete general education core requirements. Curriculum guides designate specific courses that must be taken to satisfy these requirements. When general education elective courses are required as specified in curriculum guides, students may select from the courses in the following lists. Students may not use the same course to satisfy more than one curriculum requirement.

Students who plan to transfer are advised to consult a TCC transfer counselor, appropriate transfer guides, and prospective transfer colleges/universities to ensure electives meet transfer requirements.

Communication Elective:
ENG 111¹, 112
CST 100, 110

Mathematics Elective²:
MTH 152, 157, 158, 163, 164, 166, 173, 174, 270, 277, 279, 285

Science with Lab Elective (Natural Sciences)³:
BIO 101, 102, 141, 142
CHM 111, 112⁴
ENV 121,122
GOL 105, 106, 110, 111, 112
NAS 125, 130, 131, 132
PHY 100, 201, 202, 241, 242

Humanities Elective⁵:
ART 101, 102, 201, 202
CST 130, 141, 151, 152, 229
ENG 125, 211, 212, 241, 242, 243, 244, 251, 252, 253, 254
HUM 201, 202, 241, 246, 256, 259, 260
MUS 121, 122, 221, 222
PHI 101, 102, 111, 115, 220, 226
REL 200, 210, 230

Social Science Elective:
ECO 120, 201, 202
GEO 210, 220, 221
HIS 101, 102, 111, 112, 121, 122
PLS 130, 211, 212, 241, 242

PSY 116, 200, 201, 202, 215, 216, 230, 231, 232, 235
SOC 200, 201, 202, 211, 268
SSC 210

¹ENG 111 is a required course in all degree and certificate programs.
²Some career and technical programs specify additional course options that generally do not transfer (i.e., MTH 103, 115, 121, and 126). To view these options, students should review their advising transcripts in the Student Information System or refer to their curriculum guides in the College Catalog.
³Associate of Science Degree: Science requires sequenced science courses with labs, and ENV 121-122 is not an acceptable sequence.
⁴CHM 110 is acceptable for some programs, as reflected in the Student Information System and the curriculum guides in the College Catalog.
⁵Students in curricula that require more than one Humanities elective may select from these additional courses for one of the electives: CHI 101, 102; FRE 101, 102, 203, 204; GER 101, 102, 201, 202; RUS 101, 102, 201, 202; SPA 101, 102, 203, 204

APPROVED ELECTIVES
In addition to required courses and general education electives, curricula may require approved electives. To view the list of courses which satisfy approved elective requirements, students should review their advising transcripts in the Student Information System and consult counselors or academic advisors. Transfer students are advised to consult transfer guides to determine transferability of elective courses.
## College/University Transfer Programs

<table>
<thead>
<tr>
<th>College/University Transfer Programs</th>
<th>Associate Degree</th>
<th>Specialization</th>
<th>Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal Arts</td>
<td>page 37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Administration</td>
<td>page 38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering*</td>
<td>page 39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Studies</td>
<td>page 39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science*</td>
<td>page 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science: Computer Science Specialization*</td>
<td>page 41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Sciences</td>
<td>page 42</td>
<td></td>
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</tr>
<tr>
<td>General Education</td>
<td>page 42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


## Associate of Arts Degree

- Liberal Arts

## Associate of Science Degree

- Business Administration
- Engineering
- General Studies
- Science
- Science (Specialization: Computer Science)
- Social Sciences

## Certificate

- General Education

The Associate of Arts (A.A.) and the Associate of Science (A.S.) degree programs are designed for students who plan to transfer to four-year colleges or universities. Courses in these programs typically parallel those required during the freshman and sophomore years of four-year Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) curricula. Students planning to transfer should meet with a transfer counselor to plan their program of study and investigate the requirements of transfer institutions before choosing courses.

## Liberal Arts

The Associate of Arts (A.A.) degree program is designed for students who plan to transfer to a four-year college or university to pursue a Bachelor of Arts (B.A.) degree program in the liberal arts. Four-year liberal arts programs prepare graduates for a wide variety of jobs in business, the arts, education, medical and legal professions, and in social and public service occupations. Liberal Arts studies emphasize fine arts, language, literature, philosophy, mathematics, science, social science and analytical and critical thinking skills, all of which prepare students for lifelong learning and social, cultural, and technological change.

## Courses required for the Liberal Arts degree are available on all four campuses.

### ASSOCIATE OF ARTS DEGREE: LIBERAL ARTS (Plan Code 648)

#### Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
</tr>
<tr>
<td>MTH 152</td>
<td>Math for the Liberal Arts II (or MTH 163)</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Beginning Foreign Language Sequence</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Humanities Elective</td>
<td>3</td>
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<td><strong>Semester Total</strong></td>
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</tbody>
</table>

#### Semester 2

<table>
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<tbody>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
</tr>
<tr>
<td>MTH 157</td>
<td>Elementary Statistics (or MTH 164)</td>
<td>3</td>
</tr>
<tr>
<td>CST 100</td>
<td>Principles of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Beginning Foreign Language Sequence</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Health/Physical Education Elective</td>
<td>2</td>
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<td><strong>Semester Total</strong></td>
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#### Semester 3

<table>
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<tr>
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<td>Humanities/Social Science Elective</td>
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<tr>
<td></td>
<td>Intermediate Foreign Language Sequence</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Science with Lab Elective</td>
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</tr>
<tr>
<td></td>
<td>Social Science Elective</td>
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#### Semester 4

<table>
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<th>Course Title</th>
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<tbody>
<tr>
<td></td>
<td>Humanities/Social Science Elective</td>
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<tr>
<td></td>
<td>Intermediate Foreign Language Sequence</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Science with Lab Elective</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
<td><strong>61</strong></td>
</tr>
</tbody>
</table>
Students may select any of the following courses to meet this requirement: HIS 101, 102, 111, 112, 121, or 122.

Students are required to choose full-year sequences.

Beginning Foreign Language sequences include: CHI 101-102; FRE 101-102; GER 101-102; RUS 101-102; SPA 101-102.

Intermediate Foreign Language sequences include: CHI 201-202; FRE 203-204; GER 201-202; RUS 201-202; SPA 203-204.

Note: Students who already have foreign language proficiency or have successfully completed two years of a foreign language in high school may petition for advanced placement. Students placed into an intermediate foreign language may substitute courses from the approved list of humanities and/or social sciences on page 35 for the language credits needed to complete the degree.

Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

**BUSINESS ADMINISTRATION**

The Associate of Science (A.S.) degree program in Business Administration is designed for students who plan to transfer to a four-year college or university to pursue a Bachelor of Science (B.S.) degree in business administration. Typical majors include accounting, economics, information systems, international business, finance, management, marketing, and public administration.

This degree program requires a strong foundation in microcomputer applications, including word processing, spreadsheets, databases, operating systems, Internet maneuverability, and email. Students can obtain proficiency in these areas by completing ITE 115 or equivalent.

Courses required for the Business Administration degree are available on all four campuses.

**ASSOCIATE OF SCIENCE DEGREE: BUSINESS ADMINISTRATION** (Plan Code: 213)

**Semester 1 (Based on a Fall Semester start)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HIS</td>
<td>History Elective3</td>
<td>3</td>
</tr>
<tr>
<td>MTH 163</td>
<td>Pre-calculus I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
<tr>
<td>Approved Business Administration Elective²</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Health/Physical Education Elective⁵</td>
<td>1</td>
<td></td>
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<tr>
<td>Semester Total</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. Students should consult an academic advisor or counselor to choose the appropriate course(s).

2. Students may substitute CST 110 for CST 100. Consult transfer institution to ensure that the substitution is appropriate for intended transfer program.

3. Students may select any of the following courses to meet this requirement: HIS 101, 102, 111, 112, 121, or 122.

4. Students are required to choose full-year sequences.

Beginning Foreign Language sequences include: CHI 101-102; FRE 101-102; GER 101-102; RUS 101-102; SPA 101-102.

Intermediate Foreign Language sequences include: CHI 201-202; FRE 203-204; GER 201-202; RUS 201-202; SPA 203-204.

Note: Students who already have foreign language proficiency or have successfully completed two years of a foreign language in high school may petition for advanced placement. Students placed into an intermediate foreign language may substitute courses from the approved list of humanities and/or social sciences on page 35 for the language credits needed to complete the degree.

Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).
ENGINEERING

The Associate of Science (A.S.) degree program in Engineering is designed for students who plan to transfer to a four-year college or university to pursue a Bachelor of Science (B.S.) degree in engineering in one of several fields. The Engineering degree program includes general education and engineering courses, which cover theoretical concepts and practical applications. Graduates with the baccalaureate degree find careers in aerospace, computer, environmental, civil, electrical/electronics, mechanical, mining/metallurgical, and nuclear engineering.

Admission to the Engineering program requires satisfactory completion of the following high school units or their equivalents: four units of English; four units of mathematics (two units of algebra, one unit of plane geometry, one unit of advanced mathematics or trigonometry and solid geometry); one unit of laboratory science; and one unit of social studies.

Engineering courses required for the Engineering degree are available at the Chesapeake and Virginia Beach campuses and at the Tri-Cities Center.

ASSOCIATE OF SCIENCE DEGREE: ENGINEERING
(Plan Code: 831)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 111</td>
<td>College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>EGR 110</td>
<td>Engineering Graphics</td>
<td>3</td>
</tr>
<tr>
<td>EGR 120</td>
<td>Introduction to Engineering</td>
<td>2</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 173</td>
<td>Calculus with Analytic Geometry I</td>
<td>5</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
<td>1</td>
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<tr>
<td>Semester Total</td>
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</tbody>
</table>

Semester 2

<table>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 112</td>
<td>College Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>ENG 112</td>
<td>College Composition II (or ENG 131)</td>
<td>3</td>
</tr>
<tr>
<td>MTH 174</td>
<td>Calculus with Analytic Geometry II</td>
<td>4</td>
</tr>
<tr>
<td>EGR 125</td>
<td>Introduction to Engineering Methods (C++)</td>
<td>4</td>
</tr>
<tr>
<td>EGR Elective</td>
<td>History Elective³</td>
<td>3</td>
</tr>
<tr>
<td>Semester Total</td>
<td></td>
<td>18</td>
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</tbody>
</table>

Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 279</td>
<td>Ordinary Differential Equations</td>
<td>4</td>
</tr>
<tr>
<td>PHY 241</td>
<td>University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>EGR Elective</td>
<td>Approved Engineering Elective²</td>
<td>3</td>
</tr>
<tr>
<td>EGR Elective</td>
<td>Humanities Elective¹</td>
<td>3</td>
</tr>
<tr>
<td>EGR Elective</td>
<td>Social Science Elective¹</td>
<td>3</td>
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<tr>
<td>Semester Total</td>
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<td>17</td>
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Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 277</td>
<td>Vector Calculus</td>
<td>4</td>
</tr>
<tr>
<td>PHY 242</td>
<td>University Physics II</td>
<td>4</td>
</tr>
<tr>
<td>EGR Elective</td>
<td>Approved Engineering Elective²</td>
<td>3</td>
</tr>
<tr>
<td>EGR Elective</td>
<td>Approved Engineering Elective²</td>
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</tr>
<tr>
<td>EGR Elective</td>
<td>Health/Physical Education Elective⁵</td>
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</tr>
<tr>
<td>EGR Elective</td>
<td>Humanities Elective¹</td>
<td>3</td>
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<tr>
<td>Semester Total</td>
<td></td>
<td>18</td>
</tr>
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</table>

Total Minimum Credits 71

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. Students should consult an academic advisor or counselor to choose the appropriate course(s).

2 Recommended courses for approved engineering electives:
   - Old Dominion University: Civil
     EGR 140 (3), EGR 245 (3), EGR 246 (3); BIO 101 (4) or GOL 105 (4) Total (13)
   - Old Dominion University: Computer
     EGR 262 (2), EGR 270 (4), EGR 271 (3); EGR 272 (3) Total (12)
   - Old Dominion University: Electrical
     EGR 262 (2), EGR 270 (4), EGR 271 (3); EGR 272 (3) Total (12)
   - Old Dominion University: Mechanical
     EGR 140 (3), EGR 245 (3), EGR 246 (3); EGR 247 (1) Total (10)
   - Old Dominion University: Modeling, Simulation & Visualization
     EGR 218 (3), EGR 230 (4), CSC 210 (4) Total (11) & substitute MTH 243 for MTH 277
   - Virginia Tech: Civil
     EGR 140 (3), EGR 245 (3), EGR 246 (3) Total (9)
   - Virginia Tech: Computer
     EGR 270 (4), EGR 271 (3), EGR 272 (3) Total (10)
   - Virginia Tech: Electrical
     EGR 270 (4), EGR 271 (3), EGR 272 (3) Total (10)
   - Virginia Tech: Mechanical
     EGR 140 (3), EGR 245 (3), EGR 246 (3) Total (9)

   For engineering program requirements at other universities see EGR program head.

3 Students may select any of the following courses to meet this requirement: HIS 101, 102, 111, 112, 121, or 122.

4 Students who plan to transfer to Old Dominion University are advised to take ENG 131 in place of ENG 112.

5 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

GENERAL STUDIES

The Associate of Science (A.S.) degree in General Studies is a flexible degree that allows students to design a curriculum that meets particular transfer objectives that are not fulfilled by existing TCC transfer programs. The program consists of a minimum of 38 credits of general education with 21 additional hours that may be selected in consultation with an advisor or counselor to ensure they will be accepted for the preferred program at the four-year institution they plan to attend.

Courses required for the General Studies degree are available on all four campuses.
ASSOCIATE OF SCIENCE DEGREE: GENERAL STUDIES
(Plan Code: 699)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
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<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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</tr>
<tr>
<td>MTH</td>
<td>Mathematics Elective</td>
<td>3</td>
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<td></td>
<td>Science with Lab Elective</td>
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<td>Health/Physical Education</td>
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Semester 2

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<tbody>
<tr>
<td>ENG 112</td>
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<td>MTH</td>
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<td></td>
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<td></td>
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Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CST 100</td>
<td>Principles of Public Speaking</td>
<td>3</td>
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<tr>
<td></td>
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</tr>
<tr>
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<td>Approved Elective</td>
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<tr>
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<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities Elective</td>
<td>3</td>
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<tr>
<td></td>
<td>Social Science Elective</td>
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<tr>
<td>Semester</td>
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Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
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</tr>
<tr>
<td></td>
<td>Approved Elective</td>
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<tr>
<td></td>
<td>Humanities Elective</td>
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<td>Semester</td>
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</tbody>
</table>

Total Minimum Credits 61

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s). Mathematics courses numbered less than MTH 152 cannot be used to fulfill the mathematics requirement.

2 Students may substitute CST 110 for CST 100. Consult transfer institution to ensure that the substitution is appropriate for intended transfer program.

3 The "Approved Electives" may be satisfied with any mathematics, natural science, social science, humanities, or foreign language electives listed on page 35 in the 2015-2016 catalog. Additional course options are provided on the advising transcript in the Student Information System and/or through consultation with a counselor or academic advisor.

4 Students may select any of the following courses to meet this requirement: HIS 101, 102, 111, 112, 121, or 122.

5 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

SCIENCE

The Associate of Science (A.S.) degree program in Science prepares students to transfer to a four-year college or university to pursue a Bachelor of Science (B.S.) degree in science leading to careers in fields such as biology, chemistry, dental hygiene, forestry, general science, geophysical science, mathematics, medical technology, nuclear medicine, nursing, pharmacy, and physics. The program also prepares students for transfer into baccalaureate degrees leading to advanced studies in medicine, dentistry, and veterinary medicine.

Courses required for the Science degree are available on all four campuses.

ASSOCIATE OF SCIENCE DEGREE: SCIENCE (Plan Code: 880)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
<tr>
<td>MTH 13</td>
<td>Precalculus I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Science with Lab Elective</td>
<td>4</td>
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<tr>
<td>Semester</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>3</td>
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<tr>
<td>HIS</td>
<td>History Elective</td>
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<tr>
<td>MTH 14</td>
<td>Precalculus II</td>
<td>3</td>
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<tr>
<td></td>
<td>Health/Physical Education</td>
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<tr>
<td>Semester</td>
<td>Total</td>
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Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CST 100</td>
<td>Principles of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Elective</td>
<td>3</td>
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<tr>
<td></td>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective</td>
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<tr>
<td>Semester</td>
<td>Total</td>
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</tbody>
</table>

Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td>Approved Elective</td>
<td>4</td>
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<tr>
<td></td>
<td>Humanities Elective</td>
<td>3</td>
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<tr>
<td></td>
<td>Science with Lab Elective</td>
<td>4</td>
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<tr>
<td>Semester</td>
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<td></td>
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</tbody>
</table>

Total Minimum Credits 60
1  Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s). **Sequence**d lab courses are required in natural and physical sciences, and ENV 121-122 is not an acceptable sequence.

2  Students may substitute CST 110 for CST 100. Consult transfer institution to ensure that the substitution is appropriate for intended transfer program.

3  Students may select any of the following courses to meet this requirement: HIS 101, 102, 111, 112, 121, or 122.

4  The “Approved Electives” may be satisfied with any mathematics, natural science, social science, or humanities electives listed on page 35 in the 2015-2016 catalog. Additional course options are provided on the advising transcript in the Student Information System and/or through consultation with a counselor or academic advisor.

Curriculum Options/Recommendations: Course requirements differ from college to college and major to major. Students should consult a transfer counselor or academic advisor to plan a course of study and investigate the requirements of transfer institutions before choosing mathematics courses, laboratory sciences, and electives.

Biological/Pharmaceutical/Biological Sciences: Students should take MTH 163-164 and take a third laboratory science that is appropriate to their curriculum for the approved elective credits. Some colleges and universities require calculus for their biology and pharmacy majors. Students should check college catalogs and transfer guides to determine mathematics and laboratory science requirements.

Chemistry/Physics/Mathematics/Geophysical Sciences: Students should take MTH 173, 174, 277, and 279 to ensure junior-level status at the transfer institution. Mathematics requirements are quite varied at transfer institutions. Students should examine the catalog requirements of the senior institutions to which they intend to transfer.

Preparation for Medical, Dental, and Veterinary Studies: Students should take MTH 163-164 and at least one semester of calculus (MTH 173). Biology (BIO 101-102), Chemistry (CHM 111-112), Organic Chemistry (CHM 241-242), and Physics (PHY 201-202) are the introductory level laboratory sciences generally completed at the freshman/sophomore level.

Health Science Majors (Dental Hygiene, Nursing, Nuclear Medicine, and Medical Technology): Students should complete MTH 163 and 157 for most baccalaureate health science majors. Students should check college catalogs and transfer guides to determine appropriate mathematics and laboratory science requirements. A waiver/substitution must be approved by the appropriate academic dean in order to substitute MTH 157 for MTH 163.

5  Students may select any of the following courses to meet this requirement: DIT 121, 125, HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

**COMPUTER SCIENCE**

The Associate of Science (A.S.) degree in Science with a Specialization in Computer Science is designed for students who plan to transfer to a four-year college or university to pursue a baccalaureate degree in computer science. This degree program also meets the needs of students seeking teacher certification in secondary mathematics or computer science.

Computer Science courses required for the Computer Science specialization are offered at the Virginia Beach and Chesapeake campuses.

---

**ASSOCIATE OF SCIENCE DEGREE: SCIENCE SPECIALIZATION: COMPUTER SCIENCE** (Plan Code: 880.01)

### Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 110</td>
<td>Introduction to Computing</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
</tr>
<tr>
<td>MTH 173</td>
<td>Calculus with Analytic Geometry I</td>
<td>5</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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<tr>
<td><strong>Semester Total</strong></td>
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</tr>
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</table>

### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 201</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
</tr>
<tr>
<td>MTH 174</td>
<td>Calculus with Analytic Geometry II</td>
<td>4</td>
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<tr>
<td><strong>Semester Total</strong></td>
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### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSC 205</td>
<td>Computer Organization</td>
<td>3</td>
</tr>
<tr>
<td>CSC 210</td>
<td>Programming with C++</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Science with Lab Elective</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Health/Physical Education Elective</td>
<td>2</td>
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<tr>
<td><strong>Semester Total</strong></td>
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### Semester 4

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSC 215</td>
<td>Advanced Computer Organization</td>
<td>3</td>
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<tr>
<td></td>
<td>Approved Elective</td>
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<td></td>
<td>Humanities Elective</td>
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<td></td>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Science with Lab Elective</td>
<td>4</td>
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<tr>
<td><strong>Semester Total</strong></td>
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<td><strong>16</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
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</tr>
</tbody>
</table>

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1  Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s). **Sequence**d lab courses are required in natural and physical sciences, and ENV 121-122 is not an acceptable sequence.

2  Students may select any of the following courses to meet this requirement: HIS 101, 102, 111, 112, 121, or 122.

3  The “Approved Electives” may be satisfied with any mathematics, natural science, social science, or humanities electives listed on page 35 in the 2015-2016 catalog. Additional course options are provided on the advising transcript in the Student Information System and/or through consultation with a counselor or academic advisor.

4  Students may select any of the following courses to meet this requirement: DIT 121, 125, HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).
SOCIAL SCIENCES

The Associate of Science (A.S.) degree in Social Sciences is designed for students who plan to transfer to a four-year college or university to pursue a baccalaureate degree in one of the social or behavioral sciences. Social Sciences include academic disciplines such as anthropology, economics, geography, history, political science, sociology, and psychology. The A.S. in Social Sciences also prepares students for some teacher certification programs.

Courses required for the Social Sciences degree are available on all four campuses.

ASSOCIATE OF SCIENCE DEGREE: SOCIAL SCIENCES
(Plan Code: 882)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
</tr>
<tr>
<td>MTH 152</td>
<td>Math for the Liberal Arts II (or MTH 163)</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Health/Physical Education Elective</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Science with Lab Elective</td>
<td>4</td>
</tr>
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<td></td>
<td><strong>Semester Total</strong></td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
<tr>
<td>HIS</td>
<td>History Elective</td>
<td>3</td>
</tr>
<tr>
<td>MTH 157</td>
<td>Elementary Statistics (or MTH 164)</td>
<td>3</td>
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<tr>
<td></td>
<td>Science with Lab Elective</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective</td>
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<tr>
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<td><strong>Semester Total</strong></td>
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Semester 3

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CST 100</td>
<td>Principles of Public Speaking</td>
<td>3</td>
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<tr>
<td></td>
<td>Approved Elective</td>
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<td>Humanities Elective</td>
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<td>Social Science Elective</td>
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<tr>
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<td>Social Science Elective</td>
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Semester 4

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<th>Course Title</th>
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<tr>
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<td>Approved Elective</td>
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<tr>
<td></td>
<td>Approved Elective</td>
<td>3</td>
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<tr>
<td></td>
<td>Approved Elective</td>
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<tr>
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<td>Humanities Elective</td>
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<tr>
<td></td>
<td><strong>Semester Total</strong></td>
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</tr>
<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
<td><strong>61</strong></td>
</tr>
</tbody>
</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. Students should consult an academic advisor or counselor to choose the appropriate course(s).

2. Students may substitute CST 110 for CST 100. Consult transfer institution to ensure that the substitution is appropriate for intended transfer program.

3. Students may select any of the following courses to meet this requirement: HIS 101, 102, 111, 112, 121, or 122.

4. The “Approved Electives” may be satisfied with any mathematics, natural science, social science, or humanities electives listed on page 35 in the 2015-2016 catalog. Additional course options are provided on the advising transcript in the Student Information System and/or through consultation with a counselor or academic advisor.

5. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

GENERAL EDUCATION

The Certificate in General Education program consists of 33 credits that may be selected in consultation with an academic advisor or counselor to ensure they are appropriate to meet the student’s transfer and educational goals. It is a flexible program that offers the student an opportunity to combine courses to meet a subset of lower level general education requirements at a four-year college or university. The Certificate is not intended to represent a comprehensive general education core or to insure the same ease of transferability as the transfer degrees.

Under current guidelines, Federal financial aid cannot be used to enroll in the General Education Certificate program. Students intending to use financial aid should enroll in one of the college’s A.A. or A.S. transfer degree programs.

CERTIFICATE: GENERAL EDUCATION
(Plan Code 655)

Communication - 6 credits; (select TWO courses)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
<tr>
<td>CST 100</td>
<td>Principles of Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Elective</td>
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<tr>
<td></td>
<td>Humanities Elective</td>
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<td>Social Science Elective</td>
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<td>Social Science Elective</td>
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</table>

Mathematics - 3 credits; (select ONE course)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 152</td>
<td>Mathematics for the Liberal Arts II</td>
<td>3</td>
</tr>
<tr>
<td>MTH 157</td>
<td>Elementary Statistics</td>
<td>3</td>
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<tr>
<td>MTH 158</td>
<td>College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 173</td>
<td>Calculus with Analytic Geometry I</td>
<td>5</td>
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</tbody>
</table>
## Sciences - 8 credits; (select TWO courses)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIO 101</td>
<td>General Biology I</td>
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<tr>
<td>BIO 102</td>
<td>General Biology II</td>
<td>4</td>
</tr>
<tr>
<td>BIO 141</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>BIO 142</td>
<td>Human Anatomy and Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>CHM 111</td>
<td>College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHM 112</td>
<td>College Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>GOL 105</td>
<td>Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>GOL 106</td>
<td>Historical Geology</td>
<td>4</td>
</tr>
<tr>
<td>GOL 111</td>
<td>Oceanography I</td>
<td>4</td>
</tr>
<tr>
<td>GOL 112</td>
<td>Oceanography II</td>
<td>4</td>
</tr>
<tr>
<td>NAS 125</td>
<td>Meteorology</td>
<td>4</td>
</tr>
<tr>
<td>NAS 131</td>
<td>Astronomy I</td>
<td>4</td>
</tr>
<tr>
<td>NAS 132</td>
<td>Astronomy II</td>
<td>4</td>
</tr>
<tr>
<td>PHY 201</td>
<td>General College Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHY 202</td>
<td>General College Physics II</td>
<td>4</td>
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## Social/Behavioral Sciences - 9 credits; (select THREE courses)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECO 201</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECO 202</td>
<td>Principles of Microeconomics</td>
<td>3</td>
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<td>Personal Training and Fitness</td>
<td></td>
<td></td>
<td>page 110</td>
<td></td>
</tr>
<tr>
<td>Pharmacy Technician*</td>
<td></td>
<td></td>
<td>page 111</td>
<td></td>
</tr>
<tr>
<td>Phlebotomy*</td>
<td></td>
<td></td>
<td>page 110</td>
<td></td>
</tr>
<tr>
<td>Photographic Media Arts (Studio Arts)</td>
<td></td>
<td></td>
<td>page 116</td>
<td></td>
</tr>
<tr>
<td>Physical Therapist Assistant*</td>
<td></td>
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<td>page 111</td>
<td></td>
</tr>
<tr>
<td>Plant Production* (Horticulture)</td>
<td></td>
<td></td>
<td>page 81</td>
<td></td>
</tr>
<tr>
<td>Pre-Art Therapy (Studio Arts)</td>
<td></td>
<td></td>
<td>page 117</td>
<td></td>
</tr>
<tr>
<td>Programmer Trainee* (Information Systems Technology)</td>
<td></td>
<td></td>
<td>page 95</td>
<td></td>
</tr>
<tr>
<td>Quality Assurance* (Industrial Technology)</td>
<td></td>
<td></td>
<td>page 89</td>
<td></td>
</tr>
<tr>
<td>Radiography*</td>
<td></td>
<td></td>
<td>page 112</td>
<td></td>
</tr>
<tr>
<td>Renewable Energy Technologies (Electrical Technology)</td>
<td></td>
<td></td>
<td>page 69</td>
<td></td>
</tr>
<tr>
<td>Respiratory Therapy*</td>
<td></td>
<td></td>
<td>page 113</td>
<td></td>
</tr>
<tr>
<td>Retail Management **</td>
<td></td>
<td></td>
<td>page 114</td>
<td></td>
</tr>
<tr>
<td>Server Infrastructure Administrator - Windows 2012* (Information Systems Technology)</td>
<td></td>
<td></td>
<td>page 95</td>
<td></td>
</tr>
<tr>
<td>Small Business Management (Management)</td>
<td></td>
<td></td>
<td>page 100</td>
<td></td>
</tr>
</tbody>
</table>
CAREER AND TECHNICAL EDUCATION

ACCOUNTING

Associate of Applied Science Degree
- Accounting

Certificate
- Accounting Specialist

Career Studies Certificate
- Accounting Technician

The Accounting programs prepare students for careers in the accounting field or assist students in updating their skills if they are working in the accounting field. Graduates may seek employment as a bookkeeper or as an accounting or auditing clerk.

Students with a baccalaureate degree who wish to pursue the Certified Public Accountant (CPA) examination may use specific course work toward fulfillment of accounting educational requirements. Some course work also meets federal government guidelines for those interested in qualifying for positions or promotions in the federal government. Students should consult an accounting instructor to determine the courses that meet the educational requirements.

The Associate of Applied Science (A.A.S.) degree provides students with a strong foundation in accounting and business, along with general education requirements, enabling students to seek entry-level employment in accounting. In addition, the course work prepares students for certification exams.

The certificate programs provide course work that gives students the skills to sit for one or more certification exams administered by the Accreditation Council for Accountancy and Taxation (ACAT).

ASSOCIATE OF APPLIED SCIENCE DEGREE: ACCOUNTING
(Plan Code: 203)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>BUS 100</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Applications and Concepts</td>
<td></td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(or higher)</td>
<td></td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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<td>Semester Total</td>
<td>17</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
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<tr>
<td>ACC 212</td>
<td>Principles of Accounting II</td>
<td>3</td>
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<tr>
<td>ACC 215</td>
<td>Computerized Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Applied Business Mathematics</td>
<td>3</td>
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<tr>
<td>BUS 200</td>
<td>Principles of Management</td>
<td>3</td>
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<tr>
<td>ECO 120</td>
<td>Survey of Economics (or ECO 201 or ECO 202)</td>
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<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
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<tr>
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<td>Semester Total</td>
<td>18</td>
</tr>
</tbody>
</table>

*STEM-H Programs: Science, Technology, Engineering, Mathematics, and Healthcare according to the Integrated Post-Secondary Education Data System (IPEDS) Classification of Instructional Program (CIP)

**Discontinuance pending College Board approval.
Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>BUS 241</td>
<td>Business Law I</td>
<td>3</td>
</tr>
<tr>
<td>ACC 221</td>
<td>Intermediate Accounting I</td>
<td>4</td>
</tr>
<tr>
<td>ACC 231</td>
<td>Cost Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACC 261</td>
<td>Principles of Federal Taxation I</td>
<td>3</td>
</tr>
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<td></td>
<td>Business Elective(^3)</td>
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<td><strong>Semester Total</strong></td>
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</table>

Semester 4

<table>
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<th>Course No.</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>ACC 222</td>
<td>Intermediate Accounting II</td>
<td>4</td>
</tr>
<tr>
<td>ACC 241</td>
<td>Auditing I</td>
<td>3</td>
</tr>
<tr>
<td>ACC 297</td>
<td>Cooperative Education in Accounting</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(or Business Elective(^3))</td>
<td></td>
</tr>
<tr>
<td>BUS 220</td>
<td>Introduction to Business Statistics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities Elective(^2)</td>
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</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
<td><strong>67</strong></td>
</tr>
</tbody>
</table>

**CERTIFICATE: ACCOUNTING SPECIALIST** (Plan Code: 202)

The Certificate in Accounting Specialist prepares students for entry-level employment in accounting and enables students to combine accounting course work with some general education course work. In addition, the course work prepares students for certification exams.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts(^1)</td>
<td>4</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I (or higher)</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>11</strong></td>
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</tbody>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 212</td>
<td>Principles of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>ACC 261</td>
<td>Principles of Federal Taxation I</td>
<td>3</td>
</tr>
<tr>
<td>BUS 241</td>
<td>Business Law I (or ACC 215(^4))</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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Semester 3

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<th>Course Title</th>
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<tbody>
<tr>
<td>ACC 221</td>
<td>Intermediate Accounting I</td>
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</tr>
<tr>
<td>ACC 222</td>
<td>Intermediate Accounting II</td>
<td>4</td>
</tr>
<tr>
<td>ACC 231</td>
<td>Cost Accounting I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>11</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
<td><strong>34</strong></td>
</tr>
</tbody>
</table>

**CAREER STUDIES: ACCOUNTING TECHNICIAN** (Plan Code: 221.203.03)

The Career Studies Certificate in Accounting Technician prepares students who already hold a degree for entry-level employment in the accounting field, for career advancement, or for certification exams.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>ACC 261</td>
<td>Principles of Federal Taxation I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>6</strong></td>
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</table>

Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ACC 212</td>
<td>Principles of Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>BUS 241</td>
<td>Business Law I (or ACC 215(^4))</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
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Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 221</td>
<td>Intermediate Accounting I</td>
<td>4</td>
</tr>
<tr>
<td>ACC 222</td>
<td>Intermediate Accounting II</td>
<td>4</td>
</tr>
<tr>
<td>ACC 231</td>
<td>Cost Accounting I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>11</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

1. ITE 115 satisfies the college's computer competency requirement for graduation.

2. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

3. Business electives include courses that have the following prefix: ACC, ACQ, AST, BUS, ECO, FIN, GIS, HRI, ITD, ITE, ITN, ITP, LGL, MKT, and REA.

4. Students with a baccalaureate degree who wish to complete requirements to sit for the Certified Public Accountant (CPA) examination must take BUS 241. Those who are employed in government positions who require college credit in accounting for promotion or those seeking government employment and other students should take ACC 215.
ADMINISTRATION OF JUSTICE

Associate of Applied Science Degree:
- Administration of Justice

The Associate of Applied Science (A.A.S.) degree in Administration of Justice offers a broad educational foundation, as well as specialized focus areas in law enforcement, criminology, and corrections. Students who complete this degree are prepared for careers in various areas of law enforcement, with opportunities for leadership in their chosen fields.

For those who wish to continue their education pursuits beyond the associate degree, Tidewater Community College has entered into formal articulation agreements with colleges and universities to ease transfer. Individuals interested in this option are encouraged to consult with a TCC advisor early in their academic program.

ASSOCIATE OF APPLIED SCIENCE DEGREE: ADMINISTRATION OF JUSTICE (Plan Code: 400)

Semester 1 (Based on a Fall Semester start)

Course No. | Course Title                                | Credits |
-----------|---------------------------------------------|---------|
ADJ 110    | Introduction to Law Enforcement             | 3       |
ADJ 111    | Law Enforcement Organization and Administration I | 3       |
ADJ 247    | Criminal Behavior (or PSY 255)             | 3       |
ENG 111    | College Composition I                      | 3       |
SDV 100    | College Success Skills                      | 1       |
Social Science Elective | 3       |
Semester Total |                                       | 16      |

Semester 2

Course No. | Course Title                                | Credits |
-----------|---------------------------------------------|---------|
ADJ 140    | Introduction to Corrections                 | 3       |
ADJ 201    | Criminology                                 | 3       |
ENG 112    | College Composition II                     | 3       |
Social Science Elective | 3       |
Humanities Elective | 3       |
Semester Total |                                       | 15      |

Semester 3

Course No. | Course Title                                | Credits |
-----------|---------------------------------------------|---------|
ADJ 105    | The Juvenile Justice System                 | 3       |
ADJ 211    | Criminal Law, Evidence and Procedures I     | 3       |
Mathematics Elective | 3       |
Science with Lab Elective | 4       |
Health/Physical Education Elective | 2       |
Approved ADJ Elective | 3       |
Semester Total |                                       | 18      |

Semester 4

Course No. | Course Title                                | Credits |
-----------|---------------------------------------------|---------|
ADJ 212    | Criminal Law, Evidence and Procedures II    | 3       |
ADJ 236    | Principles of Criminal Investigation        | 3       |
ADJ 299    | Supervised Study in ADJ                     | 4       |
CST 100    | Principles of Public Speaking²              | 3       |
Science with Lab Elective | 4       |
Semester Total |                                       | 17      |
Total Minimum Credits |                               | 66      |

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Students may substitute CST 110 for CST 100.

3 Any ADJ course not already applied to the degree satisfies this requirement.

4 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

ADMINISTRATIVE SUPPORT TECHNOLOGY

Associate of Applied Science Degree
- Administrative Support Technology

Career Studies Certificate:
- Administrative Assistant
  Specialization: Medical Administrative Assistant

Career Studies Certificate:
- Medical Administrative Assistant

The Administrative Support Technology programs provide students with an array of skills in preparation for work as administrative assistants, executive assistants or office managers in fields such as business, government, and education. Students may choose a cooperative education option in which they earn academic credit while gaining work experience at local sites.

Upon completion of these programs, graduates may enhance their knowledge base further with additional credentials such as Microsoft Office certifications and Certified Administrative Professional (CAP) completion.

ASSOCIATE OF APPLIED SCIENCE DEGREE: ADMINISTRATIVE SUPPORT TECHNOLOGY (Plan Code: 298)

Semester 1 (Based on a Fall Semester start)

Course No. | Course Title                                | Credits |
-----------|---------------------------------------------|---------|
AST 101    | Keyboarding I                               | 3       |
BUS 100    | Introduction to Business                    | 3       |
<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 125</td>
<td>Applied Business Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I (or higher)</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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Semester Total 16

**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST 102</td>
<td>Keyboarding II</td>
<td>3</td>
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<tr>
<td>AST 141</td>
<td>Word Processing (Microsoft Office Word)</td>
<td>4</td>
</tr>
<tr>
<td>AST 205</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>AST 236</td>
<td>Specialized Software Applications</td>
<td>4</td>
</tr>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
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Semester Total 17

**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AST 150</td>
<td>Desktop Publishing I (Microsoft Office Word)</td>
<td>1</td>
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<tr>
<td>AST 201</td>
<td>Keyboarding III</td>
<td>3</td>
</tr>
<tr>
<td>AST 234</td>
<td>Records and Database Management</td>
<td>3</td>
</tr>
<tr>
<td>AST 243</td>
<td>Office Administration I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 215</td>
<td>Advanced Computer Applications and Integration</td>
<td>4</td>
</tr>
<tr>
<td>Social Science Elective</td>
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Semester Total 17

**Semester 4**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ACC 220</td>
<td>Accounting for Small Business (or ACC 211)</td>
<td>3</td>
</tr>
<tr>
<td>AST 244</td>
<td>Office Administration II</td>
<td>3</td>
</tr>
<tr>
<td>AST 297</td>
<td>Cooperative Education (or Approved Elective)</td>
<td>3</td>
</tr>
<tr>
<td>ITE 130</td>
<td>Introduction to Internet Services</td>
<td>4</td>
</tr>
<tr>
<td>Humanities Elective</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Semester Total 16

Total Minimum Credits 29

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. AST 236 satisfies the college’s computer competency requirement for graduation.


CAREER STUDIES: ADMINISTRATIVE ASSISTANT
(Plan Code: 221.298.07)

The Career Studies Certificate in Administrative Assistant prepares students for entry-level positions such as file clerk and office assistant at an array of businesses.

**Medicine Administrative Assistant**

The Medical Administrative Assistant program is aimed specifically at those interested in positions working as administrative assistants, executive assistants, or office managers in the medical field. Students may choose a cooperative education option in which they earn academic credit while gaining work experiences at local health care sites.

**ASSOCIATE OF APPLIED SCIENCE DEGREE: ADMINISTRATIVE SUPPORT TECHNOLOGY**

Specialization: Medical Administrative Assistant (Plan Code: 298.11)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST 101</td>
<td>Keyboarding I</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Applied Business Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HLT 143</td>
<td>Medical Terminology I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I (or higher)</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
</tbody>
</table>

Semester Total 16
### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST 102</td>
<td>Keyboarding II</td>
<td>3</td>
</tr>
<tr>
<td>AST 236</td>
<td>Specialized Software Applications&lt;sup&gt;2&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td>AST 245</td>
<td>Medical Machine Transcription</td>
<td>3</td>
</tr>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
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<td>HLT 144</td>
<td>Medical Terminology II</td>
<td>3</td>
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### Semester 3

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
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<td>Medical Machine Transcription</td>
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<td>AST 271</td>
<td>Medical Office Procedures I</td>
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</tr>
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</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. AST 236 satisfies the college’s computer competency requirement for graduation.

3. Approved Electives:
   - ASL 101 – American Sign Language I
   - BUS 117 – Leadership Development
   - BUS 200 – Principles of Management
   - BUS 201 – Organizational Behavior
   - BUS 205 – Human Resource Management
   - BUS 241 – Business Law I
   - BUS 265 – Ethical Issues in Management
   - BUS 280 – Introduction to International Business
   - MKT 260 – Customer Service Management

### AMERICAN SIGN LANGUAGE

**Associate of Applied Science Degree:**
- ASL-English Interpretation

**Career Studies Certificate:**
- American Sign Language

The Associate of Applied Science (A.A.S.) degree in American Sign Language-English Interpretation is a two-and-a-half year full-time program that prepares students for entry-level interpreting employment in the K-12 educational environment, within the community, or with governmental and private entities. Students are trained to provide effective communication access between Deaf and hearing people.

Entrance requirements for this program include placement into ASL 261 and ENG 111. Following acceptance into the program, students must maintain a C or better in each applicable prerequisite course in order to register for its subsequent course.

Individuals in the ASL-English Interpretation program may elect to pursue additional credentials following completion of the A.A.S. The ASL-English Interpretation program prepares students to take the Virginia Quality Assurance Screening (VQAS) and the Educational Interpreter’s Proficiency Assessment (EIPA).

For further information go to: www.tcc.edu (search keyword “ASL”). For academic counseling, career advisement, and admission to the ASL Studies or the Interpreter Education program, please call (757) 214-6157.
## ASSOCIATE OF APPLIED SCIENCE DEGREE: ASL-ENGLISH INTERPRETATION (Plan Code: 640)

**Semester 1 (Based on a Fall Semester start)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ASL 220</td>
<td>Comparative Linguistics: ASL and English</td>
<td>3</td>
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<tr>
<td>ASL 261</td>
<td>American Sign Language V</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>INT 105</td>
<td>Interpreting Foundations I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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<td></td>
<td><strong>Semester Total</strong></td>
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**Semester 2**

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>ASL 262</td>
<td>American Sign Language VI</td>
<td>3</td>
</tr>
<tr>
<td>INT 106</td>
<td>Interpreting Foundations II</td>
<td>3</td>
</tr>
<tr>
<td>INT 107</td>
<td>Translation Skills</td>
<td>3</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I</td>
<td>3</td>
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**Semester 3**

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<tbody>
<tr>
<td>INT 130</td>
<td>Interpreting: An Introduction to the Profession</td>
<td>3</td>
</tr>
<tr>
<td>INT 133</td>
<td>ASL-to-English Interpretation I</td>
<td>3</td>
</tr>
<tr>
<td>INT 134</td>
<td>English-to-ASL Interpretation I</td>
<td>3</td>
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<td></td>
<td>Social Science Elective</td>
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<td><strong>Semester Total</strong></td>
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**Semester 4**

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<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>INT 233</td>
<td>ASL-to-English Interpretation II</td>
<td>3</td>
</tr>
<tr>
<td>INT 234</td>
<td>English-to-ASL Interpretation II</td>
<td>3</td>
</tr>
<tr>
<td>INT 235</td>
<td>Interpreting in the Educational Setting</td>
<td>3</td>
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<td></td>
<td>Psychology Elective</td>
<td>3</td>
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**Semester 5**

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<th>Course Title</th>
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<tbody>
<tr>
<td>INT 236</td>
<td>Interpreting in Special Situations</td>
<td>3</td>
</tr>
<tr>
<td>INT 250</td>
<td>Dialog Interpretation I</td>
<td>3</td>
</tr>
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<td></td>
<td>Health/Physical Education Elective</td>
<td>2</td>
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**Semester 6**

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<tr>
<td>INT 290</td>
<td>Coordinated Internship</td>
<td>5</td>
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<td>Humanities Elective</td>
<td>3</td>
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<td></td>
<td><strong>Semester Total</strong></td>
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<td><strong>Total Minimum Credits</strong></td>
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## CAREER STUDIES: AMERICAN SIGN LANGUAGE (Plan Code: 221.640.01)

The Career Studies Certificate in American Sign Language prepares students to communicate directly with Deaf and hard of hearing individuals using American Sign Language and teaches students about the history and culture of the American Deaf Community. This CSC provides a foundation for those who are interested in pursuing further education and careers working with Deaf or hard of hearing adults in fields such as social work, vocational rehabilitation, Deaf education, and similar settings. The Career Studies Certificate will also help family members or friends and colleagues of Deaf or hard of hearing people strengthen their communication skills with individuals using ASL.

**Semester 1 (Fall, First Eight-Week)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ASL 101</td>
<td>American Sign Language I</td>
<td>3</td>
</tr>
<tr>
<td>ASL 125</td>
<td>History and Culture of the Deaf Community I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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<td><strong>Semester Total</strong></td>
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**Semester 1 (Fall, Second Eight-Week)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ASL 102</td>
<td>American Sign Language II</td>
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<td><strong>Semester Total</strong></td>
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**Semester 2 (Spring, First Eight-Week)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ASL 201</td>
<td>American Sign Language III</td>
<td>3</td>
</tr>
<tr>
<td>ASL 150</td>
<td>Working with Deaf and Hard of Hearing People</td>
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<td><strong>Semester Total</strong></td>
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**Semester 2 (Spring, Second Eight-Week)**

<table>
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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASL 202</td>
<td>American Sign Language IV</td>
<td>3</td>
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<td></td>
<td><strong>Semester Total</strong></td>
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<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
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</tbody>
</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).
AUTOMOTIVE TECHNOLOGY

Associate of Applied Science Degree:
- Automotive Technology

Career Studies Certificates:
- Automotive Chassis Systems
- Automotive Electronics
- Automotive Engine Performance
- Automotive Powertrains

The Automotive Technology programs are designed to prepare students for employment as automotive technicians, based on standards set by the National Institute for Automotive Service Excellence (ASE) and the National Automotive Technicians Education Foundation (NATEF).

The Associate of Applied Science degree in Automotive Technology is designed for those who wish to work as a service technician, diagnostician, or manufacturing representative in the automotive repair industry. The Career Studies Certificates provide the background required for those interested in entry-level positions related to automotive maintenance and repair.

Students seeking additional credentials may pursue the National Institute for Automotive Excellence (ASE) Automotive Technician Certification examinations, A/C Refrigerant Recovery License, and Virginia state inspection license.

Tidewater Community College, in partnership with industry leaders, also offers programs designed for those who plan to work with specific automobile dealerships. The Toyota Technical Education Network (T-TEN), the Mopar (Chrysler) College Automotive Program (MCAP), and the Honda Professional Automotive Career Program (PACT) are available within the Associate of Applied Science degree and the Career Studies Certificates, providing advanced knowledge of specific technologies related to these vehicles. Students in these programs will earn training credentials with their associated vehicle manufacturer.

Students are advised to consult with the program director prior to entering an Automotive Technology Program.

ASSOCIATE OF APPLIED SCIENCE DEGREE: AUTOMOTIVE TECHNOLOGY (Plan Code: 909)

<table>
<thead>
<tr>
<th>Semester 1 (Based on a Fall Semester start)</th>
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<tbody>
<tr>
<td>Course No.</td>
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<tr>
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</tr>
<tr>
<td>AUT 101</td>
</tr>
<tr>
<td>AUT 149</td>
</tr>
<tr>
<td>AUT 155</td>
</tr>
<tr>
<td>MTH 103</td>
</tr>
<tr>
<td>SDV 101</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUT 151</td>
<td>Automotive Braking Systems Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>AUT 153</td>
<td>Automotive Steering and Suspension Systems Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>Humanities Elective</td>
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<td>3</td>
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<tr>
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Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AUT 178</td>
<td>Automotive Final Drive and Manual Transmission Systems</td>
<td>4</td>
</tr>
<tr>
<td>AUT 236</td>
<td>Automotive Climate Control</td>
<td>4</td>
</tr>
<tr>
<td>Semester Total</td>
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Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUT 249</td>
<td>Advanced Automotive Electrical Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>AUT 255</td>
<td>Advanced Automotive Engine Performance Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>AUT 297</td>
<td>Cooperative Education in Automotive</td>
<td>1</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>3</td>
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Semester 5

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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUT 152</td>
<td>Automotive Engine Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>AUT 251</td>
<td>Automatic Transmissions</td>
<td>4</td>
</tr>
<tr>
<td>AUT 297</td>
<td>Cooperative Education in Automotive</td>
<td>1</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
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<td>Total Minimum Credits</td>
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<td>68</td>
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</tbody>
</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

CAREER STUDIES: AUTOMOTIVE CHASSIS SYSTEMS (Plan Code: 221.909.02)

The Career Studies Certificate in Automotive Chassis Systems prepares students to specialize in brakes, steering, and suspension diagnosis, service, and repair. The training includes preparation for the ASE certification exams in Steering and Suspension (A4) and Brakes (A5). Additionally, the training includes preparation for the VA Safety Inspection exam.

<table>
<thead>
<tr>
<th>Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course No.</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>AUT 101</td>
</tr>
<tr>
<td>AUT 149</td>
</tr>
<tr>
<td>AUT 297</td>
</tr>
<tr>
<td>Semester Total</td>
</tr>
<tr>
<td>Course No.</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>AUT 151</td>
</tr>
<tr>
<td>AUT 153</td>
</tr>
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<td>AUT 297</td>
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Semester 1

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AUT 101</td>
<td>Introduction to Automotive Systems</td>
<td>3</td>
</tr>
<tr>
<td>AUT 149</td>
<td>Basic Automotive Electrical Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>AUT 155</td>
<td>Basic Automotive Engine Performance Diagnostics</td>
<td>5</td>
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<td>AUT 297</td>
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Semester 2

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<th>Course Title</th>
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<tbody>
<tr>
<td>AUT 249</td>
<td>Advanced Automotive Electrical Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>AUT 255</td>
<td>Advanced Automotive Engine Performance Diagnostics</td>
<td>5</td>
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<td>AUT 297</td>
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Semester 1

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<tbody>
<tr>
<td>AUT 101</td>
<td>Introduction to Automotive Systems</td>
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</tr>
<tr>
<td>AUT 149</td>
<td>Basic Automotive Electrical Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>AUT 155</td>
<td>Basic Automotive Engine Performance Diagnostics</td>
<td>5</td>
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<tr>
<td>AUT 297</td>
<td>Cooperative Education in Automotive</td>
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Semester 2

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<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>AUT 249</td>
<td>Advanced Automotive Electrical Diagnostics</td>
<td>5</td>
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<tr>
<td>AUT 251</td>
<td>Automatic Transmissions</td>
<td>4</td>
</tr>
<tr>
<td>AUT 152</td>
<td>Automotive Engine Diagnostics</td>
<td>5</td>
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<tr>
<td>AUT 178</td>
<td>Automotive Final Drive and Manual Transmission</td>
<td>4</td>
</tr>
<tr>
<td>Systems</td>
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<td></td>
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<tr>
<td>AUT 297</td>
<td>Cooperative Education in Automotive</td>
<td>1</td>
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<td></td>
<td>Total Minimum Credits</td>
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</table>
CIVIL ENGINEERING TECHNOLOGY

Associate of Applied Science Degree:
- Civil Engineering Technology

Career Studies Certificates:
- Construction Project Management
- Inspections/Lab Technology**
- Land Surveying
- Geographic Information Systems (GIS) (see GIS program listing under the Information Systems Technology Career Studies Certificate options)

The Civil Engineering Technology (CET) programs prepare students for careers related to large construction projects, such as roadways, bridges, and buildings. Students analyze construction sites, use and maintain equipment, draft plans, and write reports. The Associate of Applied Science (A.A.S.) degree provides fundamentals of engineering technology, surveying, construction materials, soil testing, and computer-aided drafting (CAD), as well as environmental technology and fluid mechanics. Graduates are prepared for positions such as engineering technicians in varying civil engineering fields, such as land development, construction, transportation, geotechnical engineering, hydraulic systems, environmental engineering, structural design, surveying, geographic information systems, and similar roles.

The Career Studies Certificate in Geographic Information Systems (GIS) is designed to provide students with skills to visualize, analyze, and model systems to help in the planning and decision-making processes of a business organization. Graduates are prepared for positions in fields such as city and regional planning, surveying and mapping, transportation, and local government. Additional information is available in the Information Systems Technology section of the catalog.

ASSOCIATE OF APPLIED SCIENCE DEGREE: CIVIL ENGINEERING TECHNOLOGY (Plan Code: 915)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CIV 110</td>
<td>Introduction to Civil Engineering Technology</td>
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<tr>
<td>CIV 115</td>
<td>Civil Engineering Drafting</td>
<td>3</td>
</tr>
<tr>
<td>CIV 171</td>
<td>Surveying I</td>
<td>3</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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<td>Social Science Elective³</td>
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Semester 2

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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>CIV 172</td>
<td>Surveying II</td>
<td>3</td>
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<tr>
<td>MTH 164</td>
<td>Precalculus II</td>
<td>3</td>
</tr>
<tr>
<td>Approved Technical Elective²</td>
<td></td>
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<td>Health/Physical Education Elective³</td>
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<td>3</td>
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Semester 3

<table>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CIV 200</td>
<td>Fundamentals of Building Construction</td>
<td>3</td>
</tr>
<tr>
<td>CIV 230</td>
<td>Civil Construction Materials</td>
<td>3</td>
</tr>
<tr>
<td>MEC 131</td>
<td>Mechanics I – Statics for Engineering Technology</td>
<td>3</td>
</tr>
<tr>
<td>Approved Technical Elective²</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Approved Technical Elective²</td>
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Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIV 225</td>
<td>Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CIV 226</td>
<td>Soil Mechanics Laboratory</td>
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</tr>
<tr>
<td>CIV 240</td>
<td>Fluid Mechanics and Hydraulics</td>
<td>3</td>
</tr>
<tr>
<td>MEC 132</td>
<td>Mechanics II – Strength of Materials</td>
<td>3</td>
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<tr>
<td>Approved Technical Elective²</td>
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<td>3</td>
</tr>
<tr>
<td>Approved Technical Elective²</td>
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<tr>
<td>Semester Total</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Total Minimum Credits</td>
<td></td>
<td>66</td>
</tr>
</tbody>
</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Eligible courses for Approved Technical Elective include CAD 151, CAD 201, CHM 111, GIS 200, GIS 201, MTH 173, PHY 201, PHY 202 and any course with a CIV prefix or BLD prefix not required for the degree.

3 Students may select any of the following courses to meet this requirement: DIT 121, 125, HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

CAREER STUDIES: CONSTRUCTION PROJECT MANAGEMENT (Plan Code: 221.917.01)

The Career Studies Certificate in Construction Project Management is designed to address all aspects of managing construction sites, including areas such as job-site administration, estimating and bidding, construction bidding, construction systems, construction safety, and construction surveying applications.
<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course No.</strong></td>
<td><strong>Course Title</strong></td>
</tr>
<tr>
<td>BLD 111</td>
<td>Blue Print Reading and the Building Code</td>
</tr>
<tr>
<td>CIV 171</td>
<td>Surveying I</td>
</tr>
<tr>
<td>CIV 200</td>
<td>Fundamentals of Building Construction</td>
</tr>
<tr>
<td>CIV 230</td>
<td>Civil Construction Materials</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

**CAREER STUDIES: INSPECTIONS/LAB TECHNOLOGY**

(Plan Code 221.915.03)

The Career Studies Certificate in Inspections/Lab Technology prepares students for careers as construction inspectors or lab technicians. Students learn the fundamental theories of civil engineering material and standard laboratory and field testing practices that relate to the ordering of materials required for technical projects, and to the ensuring of safety and durability in those materials.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course No.</strong></td>
<td><strong>Course Title</strong></td>
</tr>
<tr>
<td>CIV 110</td>
<td>Introduction to Civil Engineering Technology</td>
</tr>
<tr>
<td>CIV 120</td>
<td>Masonry Technology</td>
</tr>
<tr>
<td>CIV 230</td>
<td>Civil Construction Materials</td>
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<tr>
<td><strong>Semester Total</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

**CAREER STUDIES: LAND SURVEYING**

(Plan Code 221.915.03)

The Career Studies Certificate in Land Surveying emphasizes land and field surveying practices and office techniques, utilizing a variety of up-to-date instruments, including levels, total stations, and GPS units. Graduates of this program may wish to continue their careers toward their Land Surveyor-In-Training (LIST) certification.
Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUB 297</td>
<td>Cooperative Education</td>
<td>2</td>
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<td></td>
<td>2</td>
</tr>
<tr>
<td>Total Minimum Credits</td>
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<td>9</td>
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</tbody>
</table>

CAREER STUDIES: COLLISION REPAIR TECHNOLOGY: REFINISHING (Plan Code: 221.909.12)

The Career Studies Certificate in Collision Repair Technology: Refinishing prepares students for an entry-level position at a collision repair facility performing refinishing techniques and paint defect diagnosis. Topics in this program include vehicle preparation, paints and thinners, painting techniques, and paint defect diagnosis. Students completing this program will obtain their Inter-Industry Conference on Auto Collision Repair (I-CAR) certifications for ProLevel 1 Refinishing.

Students enrolled in this curriculum are not eligible for federal financial assistance.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUB 127</td>
<td>Introduction to Collision Repair Technology</td>
<td>3</td>
</tr>
<tr>
<td>AUB 119</td>
<td>Automotive Painting</td>
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Semester 2

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>AUB 297</td>
<td>Cooperative Education</td>
<td>2</td>
</tr>
<tr>
<td>Semester Total</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total Minimum Credits</td>
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<td>9</td>
</tr>
</tbody>
</table>

COMPUTER-AIDED DRAFTING AND DESIGN TECHNOLOGY

The Computer-Aided Drafting and Design Technology program has three different options for students seeking to obtain a degree or choosing to develop or update their technical skills. Those working toward the degree program have a choice between two degree options. The Architectural Drafting and Design Technology specialization prepares students for work in architectural, engineering, and design firms. The Associate of Applied Science (A.A.S.) degree concentrates on mechanical drafting and design and prepares students for employment in the fields of mechanical and machine design, structural, manufacturing, civil engineering, marine design, and construction. The third option, for those seeking only to acquire or hone their technical skills, is the 33-credit Certificate in Computer-Aided Drafting and Design Technology which primarily consists of technical courses. Students who already have a degree frequently see this Certificate as an excellent choice.

The Associate of Applied Science degree is offered at the Portsmouth and Virginia Beach campuses and focuses on preparing students to work successfully in computer-aided design and related computer-aided manufacturing operations (CAD/CAM). Graduates typically find employment in the fields of mechanical and machine design, structural design, manufacturing, civil engineering, marine design, construction, and related areas. Using Autodesk software, students learn to prepare working drawings reflecting national and international standards, practices, and procedures. Additionally, students learn to prepare engineering drawings supporting mechanical engineering and design utilizing welding details, industrial piping, geometric dimensioning and tolerancing, electrical schematics, sheet metal developments, and solid modeling.

Under formal articulation agreements, students may transfer course work to a baccalaureate degree program in an engineering technology area. Students planning on pursuing a baccalaureate degree should meet with the program head in his/her academic plan and consult the receiving institution's catalog and transfer guide.

In addition to preparing students to move directly into business and industry and providing for college transfer opportunities upon graduation, the CADD program is designed to work in partnership with local business and industry to meet their educational and training needs.

ASSOCIATE OF APPLIED SCIENCE DEGREE: COMPUTER-AIDED DRAFTING AND DESIGN TECHNOLOGY (Plan Code: 729)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD 161</td>
<td>Engineering Drawing Fundamentals I</td>
<td>3</td>
</tr>
<tr>
<td>CAD 201</td>
<td>Computer-Aided Drafting and Design I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MEC 111</td>
<td>Materials for Industry</td>
<td>3</td>
</tr>
<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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### Semester 2

<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>CAD 152</td>
<td>Engineering Drawing Fundamentals II</td>
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</tr>
<tr>
<td>CAD 202</td>
<td>Computer-Aided Drafting and Design II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 164</td>
<td>Pre Calculus II</td>
<td>3</td>
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<tr>
<td>Humanities Elective</td>
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<td>3</td>
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<tr>
<td>Social Science Elective</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Semester Total</strong></td>
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### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CAD 211</td>
<td>Advanced Technical Drafting I</td>
<td>3</td>
</tr>
<tr>
<td>CAD 241</td>
<td>Parametric Solid Modeling I</td>
<td>3</td>
</tr>
<tr>
<td>MEC 131</td>
<td>Mechanics I – Statics for Engineering Technology</td>
<td>3</td>
</tr>
<tr>
<td>PHY 201</td>
<td>General College Physics II</td>
<td>4</td>
</tr>
<tr>
<td>(or Approved Technical Elective)</td>
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<td></td>
</tr>
<tr>
<td>Approved Technical Elective</td>
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### Semester 4

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CAD 212</td>
<td>Advanced Technical Drafting II</td>
<td>3</td>
</tr>
<tr>
<td>CAD 280</td>
<td>Design Capstone Project</td>
<td>3</td>
</tr>
<tr>
<td>MEC 132</td>
<td>Mechanics II – Strength of Materials for Engineering Technology</td>
<td>3</td>
</tr>
<tr>
<td>PHY 202</td>
<td>General College Physics II</td>
<td>4</td>
</tr>
<tr>
<td>(or Approved Technical Elective)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health/Physical Education Elective</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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<td><strong>18</strong></td>
</tr>
<tr>
<td><strong>Total Minimum Credits</strong></td>
<td></td>
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</tbody>
</table>

### Architectural Drafting and Design Technology

The Architectural Drafting and Design Technology specialization is offered at the Virginia Beach Campus and prepares students for employment as advanced CADD drafters or designers in an architectural firm. Graduates have the knowledge and skills to pursue a wide variety of employment opportunities in the design and construction industry. Under formal articulation agreements, students may transfer course work toward a baccalaureate degree in an engineering technology field or to some schools of architecture. Students planning on pursuing a baccalaureate degree should meet with the program head early in their academic plan and consult the receiving institution’s catalog and transfer guide.

The faculty are experienced educators and professionals such as practicing architects and engineers. They bring in current practices and knowledge of the latest building materials, construction methods and computer technology. The program is highly regarded in the Virginia architectural community for its ability to challenge its students and teach essential technical skills for which employers are looking. Students in the program have the opportunity to sample a variety of interest areas within the discipline, including building and site planning, architectural graphic techniques, computer-aided drafting, rendering and animation, materials and construction technology, architectural history, international study, building codes, office practices, structures and more. Students may begin fall, spring, or summer semester.

The Specialization in Architectural Drafting and Design Technology prepares students for employment in these businesses and industries:

- Architect offices
- Engineering consulting firms (civil, mechanical, and electrical)
- Landscape architect offices
- Construction management firms
- Building contracting firms
- Building developers
- Computer drafting and mapping service companies
- Construction material suppliers and producers (sales, shop drawings)
- Facilities planning offices

### Associate of Applied Science Degree: Computer-Aided Drafting and Design Technology

**Specialization:** Architectural Drafting and Design Technology

(Plan Code: 729.01)

### Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC 100</td>
<td>Introduction to Architecture</td>
<td>3</td>
</tr>
<tr>
<td>CAD 151</td>
<td>Engineering Drawing Fundamentals I</td>
<td>3</td>
</tr>
<tr>
<td>CAD 201</td>
<td>Computer-Aided Drafting and Design I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 163</td>
<td>Pre Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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<td><strong>17</strong></td>
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### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ARC 121</td>
<td>Architectural Drafting I</td>
<td>3</td>
</tr>
<tr>
<td>ARC 133</td>
<td>Construction Methodology and Procedures I</td>
<td>3</td>
</tr>
<tr>
<td>CAD 202</td>
<td>Computer-Aided Drafting and Design II</td>
<td>4</td>
</tr>
<tr>
<td>MTH 164</td>
<td>Pre Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>(or Approved Technical Elective)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approved Technical Elective</td>
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<td><strong>Semester Total</strong></td>
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<td><strong>16</strong></td>
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### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC 122</td>
<td>Architectural Drafting II</td>
<td>3</td>
</tr>
<tr>
<td>ARC 221</td>
<td>Architectural CAD Applications Software I</td>
<td>3</td>
</tr>
<tr>
<td>MEC 131</td>
<td>Mechanics I – Statics for Engineering Technology</td>
<td>3</td>
</tr>
<tr>
<td>PHY 201</td>
<td>General College Physics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>(or Approved Technical Elective2)</td>
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</tr>
<tr>
<td></td>
<td>Health/Physical Education Elective</td>
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</tr>
<tr>
<td></td>
<td>Social Science Elective1</td>
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<tr>
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<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CAD 280</td>
<td>Design Capstone Project</td>
<td>3</td>
</tr>
<tr>
<td>MEC 132</td>
<td>Mechanics II – Strength of Materials for Engineering Technology</td>
<td>3</td>
</tr>
<tr>
<td>PHY 202</td>
<td>General College Physics II</td>
<td>4</td>
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<td></td>
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<td>16</td>
</tr>
<tr>
<td>Total Minimum Credits</td>
<td></td>
<td>67</td>
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</tbody>
</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. Consult with the program head or counselor. Eligible courses for Approved Technical Elective include any ARC, MEC, or CAD courses not required in the program.

3. Students planning on transferring to a four-year program should consult articulation agreements regarding physics requirement.

4. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

### Certificate: Computer-Aided Drafting and Design Technology (Plan Code: 727)

The CADD Certificate program provides the student with basic skills and knowledge necessary for an entry-level position as a CAD operator or draftsman. Business and industry professionals can update their skills and knowledge relating to: AutoCAD and Autodesk Software, current ANSI and ISO Standards and procedures, and improve their knowledge of material selection and processing for efficient design.

### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD 151</td>
<td>Engineering Drawing Fundamentals I</td>
<td>3</td>
</tr>
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<td>CAD 201</td>
<td>Computer-Aided Drafting and Design I</td>
<td>4</td>
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<tr>
<td>ENG 111</td>
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<tr>
<td>MEC 111</td>
<td>Materials for Industry</td>
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<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
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<tr>
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<td>College Success Skills</td>
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<tr>
<td>Semester Total</td>
<td></td>
<td>17</td>
</tr>
</tbody>
</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

### CULINARY ARTS

Associate of Applied Science Degree:

- Culinary Arts

Career Studies Certificates:

- Catering
- Classical Cooking
- Kitchen Management

The Culinary Arts program is designed to provide the education and training necessary to prepare students for entry into or continued employment in food service operations. Graduates are prepared for positions such as assistant kitchen manager, chef de partie, caterer, banquet chef, chef tournant, sous chef, and eventually, executive chef.

The Culinary Arts program is accredited by the American Culinary Federation Education Foundation (ACFEF) Accrediting Commission. Graduates of the ACFEF accredited postsecondary degree program are eligible to receive a Certified Culinarian® (CC®) designation.
### ASSOCIATE OF APPLIED SCIENCE DEGREE: CULINARY ARTS  
**(Plan Code: 242)**

#### Semester 1 (Based on Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRI 106</td>
<td>Principles of Culinary Arts I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(1st 8-week session)</td>
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<tr>
<td>HRI 107</td>
<td>Principles of Culinary Arts II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(2nd 8-week session)</td>
<td></td>
</tr>
<tr>
<td>HRI 119</td>
<td>Applied Nutrition for Food Service</td>
<td>3</td>
</tr>
<tr>
<td>HRI 158</td>
<td>Sanitation and Safety</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(online 1st 8-week session)</td>
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</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I</td>
<td>3</td>
</tr>
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<td>(or higher)</td>
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<td>SDV 100</td>
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<td></td>
<td>Approved Health/Physical Education Elective</td>
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**Semester Total** 18

#### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 111</td>
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<td></td>
<td>Humanities Elective</td>
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</tr>
<tr>
<td>HRI 206</td>
<td>International Cuisine</td>
<td>3</td>
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<td>HRI 207</td>
<td>American Regional Cuisine</td>
<td>3</td>
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<tr>
<td>HRI 215</td>
<td>Food Purchasing</td>
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<tr>
<td>HRI 251</td>
<td>Food and Beverage Cost Control I</td>
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**Semester Total** 18

#### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HRI 128</td>
<td>Principles of Baking</td>
<td>3</td>
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<tr>
<td>HRI 199</td>
<td>Supervised Study in Culinary Arts</td>
<td>2</td>
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<tr>
<td>HRI 224</td>
<td>Recipe and Menu Management</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
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**Semester Total** 15

#### Semester 4

<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HRI 145</td>
<td>Garde Manger (8 weeks)</td>
<td>3</td>
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<tr>
<td>HRI 159</td>
<td>Introduction to Hospitality</td>
<td>4</td>
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<td>HRI 297</td>
<td>Cooperative Education</td>
<td>3</td>
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<td></td>
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**Semester Total** 16

**Total Minimum Credits** 67

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1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. Approved HRI Electives:
   - HRI 150 - Introduction to Hospitality Ownership
   - HRI 205 - Fundamentals of Wine
   - HRI 235 - Marketing of Hospitality Services
   - HRI 256 - Principles and Applications of Catering
   - HRI 275 - Hospitality Law
   - HRI 280 - Principles of Advanced Baking and Pastry

3. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

---

### CAREER STUDIES: CATERING  
**(Plan Code: 221.242.01)**

The Career Studies Certificate in Catering prepares individuals to work as banquet caterers, personal caterers, or business owners who wish to provide catering services to residential or commercial customers.

#### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRI 106</td>
<td>Principles of Culinary Arts I (1st 8-week session)</td>
<td>3</td>
</tr>
<tr>
<td>HRI 158</td>
<td>Sanitation and Safety (online 1st 8-week session)</td>
<td>3</td>
</tr>
<tr>
<td>HRI 107</td>
<td>Principles of Culinary Arts II (2nd 8-week session)</td>
<td>3</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I (or higher)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Semester Total** 12

**Total Minimum Credits** 24

### CAREER STUDIES: CLASSICAL COOKING  
**(Plan Code: 221.242.02)**

The Career Studies Certificate in Classical Cooking prepares students to work as food service (kitchen) workers, line cooks, and chefs in various restaurant venues.

#### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRI 106</td>
<td>Principles of Culinary Arts I (1st 8-week session)</td>
<td>3</td>
</tr>
<tr>
<td>HRI 158</td>
<td>Sanitation and Safety (online 1st 8-week session)</td>
<td>3</td>
</tr>
<tr>
<td>HRI 107</td>
<td>Principles of Culinary Arts II (2nd 8-week session)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Semester Total** 9

**Total Minimum Credits** 18
CAREER STUDIES: KITCHEN MANAGEMENT (Plan Code: 221.775.04)

The Career Studies Certificate in Kitchen Management offers preparation in the management of kitchens such as restaurants, school cafeterias, private enterprises, and franchises.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRI 106</td>
<td>Principles of Culinary Arts I</td>
<td>3</td>
</tr>
<tr>
<td>HRI 119</td>
<td>Applied Nutrition for Food Service</td>
<td>3</td>
</tr>
<tr>
<td>HRI 158</td>
<td>Sanitation and Safety (online 1st 8-week session)</td>
<td>3</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I (or higher)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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Semester 2

<table>
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<th>Course Title</th>
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<tbody>
<tr>
<td>HRI 107</td>
<td>Principles of Culinary Arts II</td>
<td>3</td>
</tr>
<tr>
<td>HRI 224</td>
<td>Recipe and Menu Management</td>
<td>3</td>
</tr>
<tr>
<td>HRI 251</td>
<td>Food and Beverage Cost Control I</td>
<td>3</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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<td><strong>9</strong></td>
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<tr>
<td><strong>Total Minimum Credits</strong></td>
<td></td>
<td><strong>21</strong></td>
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</tbody>
</table>

**Discontinuance pending College Board approval.

DEVELOPMENTAL DISABILITIES**

Career Studies Certificate:
- Special Education/Developmental Disabilities Specialist**

The Career Studies Certificate in Special Education/Developmental Disabilities Specialist is designed for those interested in working as paraprofessionals in schools and agencies. Graduates are prepared to work with children and adults with disabilities in a variety of settings. Hands-on experience is provided through opportunities for internships.

CAREER STUDIES: SPECIAL EDUCATION/DEVELOPMENTAL DISABILITIES SPECIALIST (Plan Code: 221.480.12)

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EDU 245</td>
<td>Teaching and Training of Language Skills for the Disabled</td>
<td>3</td>
</tr>
<tr>
<td>EDU 250</td>
<td>Introduction to Developmental Disabilities</td>
<td>4</td>
</tr>
<tr>
<td>EDU 254</td>
<td>Teaching Basic Academic Skills to Exceptional Children</td>
<td>3</td>
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<td><strong>Semester Total</strong></td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EDU 247</td>
<td>Adult Independent Living and Vocational Skills for the Disabled</td>
<td>4</td>
</tr>
<tr>
<td>EDU 255</td>
<td>Behavior Modification in School and Community Settings</td>
<td>4</td>
</tr>
<tr>
<td>EDU 290</td>
<td>Coordinated Internship in Education</td>
<td>4</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
<td></td>
<td><strong>12</strong></td>
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<tr>
<td><strong>Total Minimum Credits</strong></td>
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<td><strong>22</strong></td>
</tr>
</tbody>
</table>

**Discontinuance pending College Board approval.

DIAGNOSTIC MEDICAL SONOGRAPHY (ULTRASOUND)

Associate of Applied Science Degree:
- Diagnostic Medical Sonography (Ultrasound)

The Diagnostic Medical Sonography (DMS) program prepares individuals for careers as staff sonographers in radiology departments, hospital settings, private offices, outpatient clinics, military units, and the ultrasound industry. Program applications and the general admission application to the college must be submitted to the Virginia Beach Admissions Office no later than May 15.

Applicants must complete placement tests in English and math and place into ENG 111 and be eligible to take MTH 126 or higher prior to being considered for admission into the DMS program. Students must submit an unofficial transcript along with their health professions application. They must also submit an official copy of their Allied Health Program transcripts and transcripts from other colleges attended to the Central Records office at Tidewater Community College prior to the application deadline. Applicants are required to have a personal interview with the program representative.

Admission to the college does not guarantee admission to the DNS program. If admitted, students must meet certain conditions for continuance. Students are financially responsible for their uniforms and travel. For further information, go to www.tcc.edu (search keywords “diagnostic medical sonography”).

This program is accredited by the Committee on Accreditation of Allied Health Education Programs through the Joint Review Committee on Education in Diagnostic Medical Sonography.
ASSOCIATE OF APPLIED SCIENCE DEGREE: DIAGNOSTIC MEDICAL SONOGRAPHY (Plan Code: 109)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 141</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>HLT 105</td>
<td>Cardiopulmonary Resuscitation</td>
<td>1</td>
</tr>
<tr>
<td>HLT 141</td>
<td>Introduction to Medical Terminology</td>
<td>2</td>
</tr>
<tr>
<td>MTH 126</td>
<td>Mathematics for Allied Health</td>
<td>3</td>
</tr>
<tr>
<td>PHY 100</td>
<td>Elements of Physics</td>
<td>4</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Health Care</td>
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</table>

Semester Total 15

Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DMS 206</td>
<td>Introduction to Sonography</td>
<td>2</td>
</tr>
<tr>
<td>DMS 207</td>
<td>Sectional Anatomy</td>
<td>2</td>
</tr>
<tr>
<td>DMS 208</td>
<td>Ultrasound Physics and Instrumentation I</td>
<td>3</td>
</tr>
<tr>
<td>DMS 211</td>
<td>Abdominal Sonography</td>
<td>4</td>
</tr>
<tr>
<td>DMS 231</td>
<td>Clinical Education I</td>
<td>2</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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</tbody>
</table>

Semester Total 16

Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DMS 209</td>
<td>Ultrasound Physics and Instrumentation II</td>
<td>3</td>
</tr>
<tr>
<td>DMS 221</td>
<td>Ultrasound Seminar I</td>
<td>3</td>
</tr>
<tr>
<td>DMS 232</td>
<td>Clinical Education II</td>
<td>4</td>
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</tbody>
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Semester Total 10

Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DMS 212</td>
<td>Obstetrical and Gynecological Sonography</td>
<td>4</td>
</tr>
<tr>
<td>DMS 223</td>
<td>Introduction to Vascular Ultrasound</td>
<td>2</td>
</tr>
<tr>
<td>DMS 233</td>
<td>Clinical Education III</td>
<td>5</td>
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<tr>
<td>Humanities Elective</td>
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Semester Total 14

Semester 5

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DMS 222</td>
<td>Sonography Registry Review</td>
<td>3</td>
</tr>
<tr>
<td>DMS 234</td>
<td>Clinical Education IV</td>
<td>6</td>
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<tr>
<td>Social Science Elective</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Semester Total 12

Total Minimum Credits 67

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

DIESEL TECHNOLOGY

ASSOCIATE OF APPLIED SCIENCE DEGREE: DIESEL TECHNOLOGY

(Plan Code: 790)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUT 149</td>
<td>Basic Automotive Electrical Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>DSL 135</td>
<td>Introduction to Diesel Technology</td>
<td>3</td>
</tr>
<tr>
<td>DSL 137</td>
<td>Basic Diesel Engine Systems</td>
<td>5</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Automotive Technology</td>
<td>1</td>
</tr>
</tbody>
</table>

Semester Total 17

Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL 143</td>
<td>Diesel Truck Electrical Systems</td>
<td>4</td>
</tr>
<tr>
<td>DSL 145</td>
<td>Medium/Heavy Duty Truck Preventative</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Maintenance &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>DSL 237</td>
<td>Advanced Diesel Engine Systems</td>
<td>5</td>
</tr>
</tbody>
</table>

Semester Total 12

The Diesel Technology programs are designed to prepare students for employment in the diesel industry as technicians in the areas of service, maintenance, and repair. The Associate of Applied Science degree in Diesel Technology offers students an in-depth background in diesel fundamentals through theory and hands-on instruction. Students are provided with a comprehensive set of diesel skills that area employers seek when selecting technicians for their industry. Training options in career specialty areas include medium/heavy trucks and marine diesel. These programs are designed to prepare a student to work in the various industries that utilize diesel powered vehicles and equipment.

Students seeking additional credentials may pursue the National Institute for Automotive Service Excellence (ASE) Medium/Heavy Truck Certification exams.

Students are advised to consult with the program director prior to entering a Diesel Technology Program.

Careers in Diesel Technology:

- Diesel Technology
- Diesel Engine Technician
- Diesel Marine Technician
- Diesel Medium/Heavy Truck Service Technician
### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAR 140</td>
<td>Introduction to Hydraulics &amp; Hydraulic Systems</td>
<td>4</td>
</tr>
<tr>
<td>MTH 103</td>
<td>Applied Technical Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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### Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DSL 214</td>
<td>Heavy Duty Drive Train Systems</td>
<td>5</td>
</tr>
<tr>
<td>Approved Program Elective³</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Approved Program Elective³</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Humanities Elective¹</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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<td><strong>15</strong></td>
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### Semester 5

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL 297</td>
<td>Cooperative Education in Diesel</td>
<td>2</td>
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<tr>
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</tr>
<tr>
<td>Approved Program Elective³</td>
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<tr>
<td>Humanities or Social Science Elective¹</td>
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<tr>
<td>Social Science Elective¹</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Semester Total</strong></td>
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<td><strong>15</strong></td>
</tr>
<tr>
<td><strong>Total Minimum Credits</strong></td>
<td></td>
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</tr>
</tbody>
</table>

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1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. A higher level of mathematics may be taken and is recommended for students planning to transfer to a four-year college or university.

3. Approved Program Electives: Choose a course mixture of 14 credits from one of the following career specialty areas of interest. All 14 elective credits must be chosen from the same career area.

---

CAREER STUDIES: DIESEL ENGINE TECHNICIAN
(Plan Code: 221.920.02)

The Career Studies Certificate in Diesel Engine Technician is designed to prepare individuals to perform diesel engine diagnosis and service diesel fuel injection systems and components. Individuals will also be able to perform basic diesel truck electrical troubleshooting and repair. Occupational opportunities include employment in the truck service and repair industries. This certificate prepares an individual to take the Automotive Service Excellence (ASE) Medium/Heavy Truck certification exams Diesel Engines (T2) and Electrical/Electronic Systems (T6).

### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUT 149</td>
<td>Basic Automotive Electrical Diagnostics</td>
<td>5</td>
</tr>
<tr>
<td>DSL 135</td>
<td>Introduction to Diesel Technology</td>
<td>3</td>
</tr>
<tr>
<td>DSL 137</td>
<td>Basic Diesel Engines</td>
<td>5</td>
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### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MAR 130</td>
<td>Marine Maintenance Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MAR 137</td>
<td>Basic Marine Electrical Circuits</td>
<td>4</td>
</tr>
<tr>
<td>DSL 297</td>
<td>Cooperative Education in Diesel</td>
<td>2</td>
</tr>
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<td><strong>Semester Total</strong></td>
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<tr>
<td><strong>Total Minimum Credits</strong></td>
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</tbody>
</table>
CAREER STUDIES: DIESEL MEDIUM/HEAVY TRUCK SERVICE TECHNICIAN (Plan Code: 221.920.52)

The Career Studies Certificate in Diesel Medium/Heavy Truck Service Technician is designed to prepare individuals to perform preventive maintenance inspections (PMI), service air brakes, and service steering and suspension systems. Individuals will also be able to perform basic electrical troubleshooting and repair. Occupational opportunities include employment in the truck service and repair industries. This certificate prepares an individual to take the Automotive Service Excellence (ASE) Medium/Heavy Truck certification exams Diesel Engines (T2), Suspension and Steering (T5), and Electrical/Electronic Systems (T6).

| Semester 1 | | | |
|---|---|---|
| Course No. | Course Title | Credits |
| AUT 149 | Basic Automotive Electrical Diagnostics | 5 |
| DSL 135 | Introduction to Diesel Technology | 3 |
| DSL 145 | Medium/Heavy Truck Preventative Maintenance | 3 |
| Semester Total | | 11 |

| Semester 2 | | | |
|---|---|---|
| Course No. | Course Title | Credits |
| DSL 143 | Diesel Truck Electrical Systems | 4 |
| DSL 210 | Medium/Heavy Truck Brake Systems | 5 |
| DSL 212 | Medium/Heavy Duty Truck Steering and Suspension | 5 |
| DSL 297 | Cooperative Education in Diesel Technology | 2 |
| Semester Total | | 16 |
| Total Minimum Credits | | 27 |

EARLY CHILDHOOD DEVELOPMENT

Associate of Applied Science Degree:
- Early Childhood Development

Certificate:
- Early Childhood Instruction

Career Studies Certificates:
- Child Development
- Early Childhood Development: Infant and Toddler
- Early Childhood Development: Preschool
- Educational Support Specialist

The Early Childhood Development programs prepare students in the care, supervision, and education of young children from birth to age eight. The Associate of Applied Science (A.A.S.) degree provides fundamentals of child development and educational training for those entering the field. Graduates are equipped with knowledge and skills for work in settings such as preschools, child care centers and homes, Head Start programs, private schools, public schools and before-and-after school programs.

The Career Studies Certificate programs focus on specific aspects of early childhood and prepare students for work with young children in a variety of school, childcare, and agency settings.

ASSOCIATE OF APPLIED SCIENCE DEGREE: EARLY CHILDHOOD DEVELOPMENT (Plan Code: 636)

<table>
<thead>
<tr>
<th>Semester 1 (Based on a Fall Semester start)</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Course No.</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>CHD 119</td>
<td>Introduction to Reading Methods</td>
<td>3</td>
</tr>
<tr>
<td>CHD 120</td>
<td>Introduction to Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>CHD 145</td>
<td>Teaching Art, Music, and Movement to Children</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>PSY 235</td>
<td>Child Psychology (or PSY 231)</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
<tr>
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<thead>
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<tbody>
<tr>
<td>Course No.</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>CHD 118</td>
<td>Language Arts for Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CHD 146</td>
<td>Math, Science, and Social Studies for Children</td>
<td>3</td>
</tr>
<tr>
<td>CHD 205</td>
<td>Guiding the Behavior of Children</td>
<td>3</td>
</tr>
<tr>
<td>CHD 210</td>
<td>Introduction to Exceptional Children</td>
<td>3</td>
</tr>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
<tr>
<td>CST 100</td>
<td>Principles of Public Speaking (or CST 110)</td>
<td>3</td>
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<tr>
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<table>
<thead>
<tr>
<th>Semester 3</th>
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</thead>
<tbody>
<tr>
<td>Course No.</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>CHD 165</td>
<td>Observation and Participation in Early Childhood/Primary Settings</td>
<td>3</td>
</tr>
<tr>
<td>CHD 166</td>
<td>Infant and Toddler Programs</td>
<td>3</td>
</tr>
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<td>CHD 215</td>
<td>Models of Early Childhood Education Programs</td>
<td>3</td>
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<td>CHD 216</td>
<td>Early Childhood Programs, School and Social Change</td>
<td>3</td>
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<tr>
<td></td>
<td>Mathematics or Science with Lab Elective1</td>
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</tr>
<tr>
<td>Semester Total</td>
<td></td>
<td>15-16</td>
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<table>
<thead>
<tr>
<th>Semester 4</th>
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<tbody>
<tr>
<td>Course No.</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>CHD 265</td>
<td>Advanced Observation and Participation in Early Childhood/Primary Settings</td>
<td>3</td>
</tr>
<tr>
<td>CHD 270</td>
<td>Administration of Childcare Programs</td>
<td>3</td>
</tr>
<tr>
<td>CHD 298</td>
<td>Portfolio Development</td>
<td>1</td>
</tr>
<tr>
<td>HLT 135</td>
<td>Child Health and Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>SOC 215</td>
<td>Sociology of the Family</td>
<td>3</td>
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<tr>
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<td>Humanities Elective1</td>
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<tr>
<td>Total Minimum Credits</td>
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<td>65-66</td>
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</tbody>
</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).
CERTIFICATE: EARLY CHILDHOOD INSTRUCTION (Plan Code 632)

The Early Childhood Instruction Certificate trains students in the care, supervision, and education of children from birth through 12 years of age. Graduates earning this certification begin work in public and private child care centers, preschool programs, family child care homes, before-and-after school programs, and religious-sponsored programs, or as private family nannies.

Semester 1
Course No. Course Title Credits
CHD 119 Introduction to Reading Methods 3
CHD 120 Introduction to Early Childhood Education 3
ENG 111 College Composition I 3
CHD 145 Teaching Art, Music and Movement to Children 3
PSY 235 Child Psychology (or PSY 231) 3
SDV 100 College Success Skills 1
Semester Total 16

Semester 2
Course No. Course Title Credits
CHD 118 Language Arts for Young Children 3
CHD 146 Math, Science, and Social Studies for Children 3
CHD 165 Observation and Participation in Early Childhood/Primary Settings 3
CHD 205 Guiding the Behavior of Children 3
CHD 210 Introduction to Exceptional Children 3
HLT 135 Child Health and Nutrition 3
Semester Total 18
Total Minimum Credits 34

CAREER STUDIES: EARLY CHILDHOOD DEVELOPMENT: INFANT AND TODDLER CARE (Plan Code 221.636.06)

The Career Studies Certificate in Infant and Toddler Care is designed to prepare individuals to create developmentally appropriate learning environments for infants and toddlers. Occupational opportunities include employment in child development programs and child care agencies/centers that include infants and toddlers.

Semester 1
Course No. Course Title Credits
CHD 120 Introduction to Early Childhood Education 3
CHD 165 Infant and Toddler Programs 3
HLT 135 Child Health and Nutrition 3
SDV 100 College Success Skills 1
Semester Total 10

Semester 2
Course No. Course Title Credits
CHD 164 Working with Infants and Toddlers in Inclusive Settings 3
CHD 165 Observation and Participation in Early Childhood/Primary Settings 3
CHD 167 CDA Theories and Applications: Resource File1 (or approved CHD Elective) 3
Semester Total 9
Total Minimum Credits 19

1 Students who use this credential to satisfy national Head Start requirements will enroll in CHD 167 to prepare a portfolio to submit to VA DSS for evaluation. Students not using this program in that way may choose any other three-credit program-specific course which will help meet requirements for the Early Childhood Instruction certificate and ultimately the A.A.S. degree.

CAREER STUDIES: EARLY CHILDHOOD DEVELOPMENT: PRESCHOOL (Plan Code 221.636.05)

The Career Studies Certificate in Preschool education is designed to prepare individuals to create developmentally appropriate learning environments for preschool children. Occupational opportunities include employment in child development programs and child care agencies/centers that include preschool-aged children.

Semester 1
Course No. Course Title Credits
CHD 120 Introduction to Early Childhood Education 3
CHD 145 Teaching Art, Music and Movement to Children 3
HLT 135 Child Health and Nutrition 3
SDV 100 College Success Skills 1
Semester Total 10
### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHD 165</td>
<td>Observation and Participation in Early Childhood/Primary Settings</td>
<td>3</td>
</tr>
<tr>
<td>CHD 167</td>
<td>CDA Theories and Applications: Resource File(^1) (or approved CHD Elective)</td>
<td>3</td>
</tr>
<tr>
<td>CHD 205</td>
<td>Guiding the Behavior of Children</td>
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</table>

**Total Minimum Credits**: 19

---

1. Students who use this credential to satisfy national Head Start requirements will enroll in CHD 167 to prepare a portfolio to submit to VA DSS for evaluation. Students not using this program in that way may choose any other three-credit program-specific course which will help meet requirements for the Early Childhood Instruction certificate and ultimately the A.A.S. degree.

### CAREER STUDIES: EDUCATIONAL SUPPORT SPECIALIST

(Plan Code: 221.629.03)

The Career Studies Certificate in Educational Support Specialist prepares individuals for work as teaching assistants in public and private school settings. Course work includes language arts, social studies, math, and science, along with child psychology behavior guidance.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD 118</td>
<td>Language Arts for Young Children</td>
<td>3</td>
</tr>
<tr>
<td>CHD 120</td>
<td>Introduction to Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>CHD 146</td>
<td>Math, Science, and Social Studies for Children</td>
<td>3</td>
</tr>
<tr>
<td>CHD 205</td>
<td>Guiding the Behavior of Children</td>
<td>3</td>
</tr>
<tr>
<td>PSY 235</td>
<td>Child Psychology (or PSY 231)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Program Elective(^1)</td>
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</table>

**Total Minimum Credits**: 18

1. Approved program electives may be chosen from CHD 145, CHD 210, or HLT 135.

### ELECTRICAL TECHNOLOGY

**Associate of Applied Science Degree:**
- Electrical Technology

**Certificate:**
- Electrical Wiring

**Career Studies Certificates:**
- Electrical Wiring
- Electrical Wiring for Technicians
- Fiber and Data Cabling Installation
- Marine Electrical (see this program listing under the A.A.S. in Maritime Technologies Career Studies Certificate options)
- Renewable Energy Technologies

The Electrical Technology curriculum is designed to prepare students for employment in various industries as electrical/electronic technicians. Students develop the practical skills needed to calculate, install, and work with electrical machinery, machine control, and other electrically controlled devices in residential, commercial and industrial environments. In addition, this program also provides students with a comprehensive set of skills that are needed in the electrical industry.

Training options in career specialty areas include program and logic control, industrial and business management, renewable energy technologies, fiber and data cabling, and occupational safety. The degree offers students an in-depth background in electrical fundamentals through theory and hands-on instruction.

### ASSOCIATE OF APPLIED SCIENCE DEGREE: ELECTRICAL TECHNOLOGY

(Plan Code: 811)

#### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CAD 135</td>
<td>Electrical/Electronic Blueprint Reading</td>
<td>2</td>
</tr>
<tr>
<td>ELE 127</td>
<td>Residential Wiring Methods</td>
<td>3</td>
</tr>
<tr>
<td>ELE 131</td>
<td>National Electrical Code I</td>
<td>4</td>
</tr>
<tr>
<td>ELE 150</td>
<td>A.C. and D.C. Circuit Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>ETR 112</td>
<td>Math Applications for ELE/ETR Analysis</td>
<td>2</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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**Semester Total**: 15

#### Semester 2

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ELE 132</td>
<td>National Electrical Code II</td>
<td>4</td>
</tr>
<tr>
<td>ELE 146</td>
<td>Electric Motor Control</td>
<td>4</td>
</tr>
<tr>
<td>ELE 149</td>
<td>Wiring Methods in Industry</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>SAF 130</td>
<td>Industrial Safety - OSHA 10</td>
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<tr>
<td></td>
<td>Humanities or Social Science Elective(^1)</td>
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**Semester Total**: 18

#### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 148</td>
<td>Power Distribution Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELE 176</td>
<td>Introduction to Alternative Energy Including</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hybrid Systems</td>
<td></td>
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<tr>
<td>MTH 103</td>
<td>Applied Technical Mathematics (^2)</td>
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<td></td>
<td>Approved Program Elective(^1)</td>
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<tr>
<td></td>
<td>Approved Program Elective(^3)</td>
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</tr>
<tr>
<td></td>
<td>Humanities Elective(^1)</td>
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</tbody>
</table>

**Semester Total**: 18
Semester 4
Course No. Course Title Credits
ELE 217 Electric Power Utilities 3
ELE 229 Troubleshooting and Maintenance of Electrical Systems 3
Approved Program Elective3 3
Social Science Elective1 3
Total Semester Total 15
Total Minimum Credits 66
1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).
2 A higher level of mathematics may be taken and is recommended for students planning to transfer to a four-year college or university.
3 Approved Program Electives: Choose a course mixture of 12 credits from one of the following career areas of interest. All 12 elective credits must be chosen from the same career concentration. Students choosing the concentration in Renewable Energy Technologies need to successfully complete three classes to fulfill the required program electives. Programming and Logic Control: ELE 239, ELE 246, ELE 248, ETR 203, ETR 281 Industrial and Business Management: BUS 100, BUS 111, BUS 117, BUS 200, BUS 201, CST 110, IND 121, IND 122, IND 137, IND 236 Renewable Energy Technologies: ELE 178, ELE 188, ENE 105, ENE 110, ENE 120 Fiber and Data Cabling: ELE 174, ELE 179, ELE 189, ELE 250 Occupational Safety: IND 165, IND 166, IND 216, SAF 120, SAF 135, SAF 205, SAF 246

CERTIFICATE: ELECTRICAL WIRING (Plan Code: 942)
The Certificate in Electrical Wiring prepares students for employment as electricians and assists those already employed to upgrade their skills and knowledge for advancement in the field.

Semester 1
Course No. Course Title Credits
ELE 127 Residential Wiring Methods 3
ELE 131 National Electrical Code I 4
ELE 150 A.C. and D.C. Circuit Fundamentals 3
Approved ELE/ENE Elective2 3-4
ENG 111 College Composition I 3
Total Semester Total 16-17
Semester 2
Course No. Course Title Credits
ELE 132 National Electrical Code II 4
ELE 146 Electric Motor Control 4
ELE 148 Power Distribution Systems 3
ELE 149 Wiring Methods in Industry 3
Mathematics Elective1 3
Total Semester Total 14
Total Minimum Credits 24
1 Approved MTH Electives may be chosen from MTH 103, MTH 115, MTH 163, or another MTH course approved by the appropriate academic dean.
2 The ELE/ENE electives may be ELE 127, ELE 149, ELE 174, ELE 179, ELE 189, ELE 250, ENE 105, ENE 110, ENE 120, or another course approved by the appropriate academic dean.

CAREER STUDIES: ELECTRICAL WIRING FOR TECHNICIANS (Plan Code: 221.706.03)
The Career Studies Certificate in Electrical Wiring for Technicians provides classroom instruction—required by the Commonwealth of Virginia—to take the electrician licensing examination.

Semester 1
Course No. Course Title Credits
ELE 131 National Electrical Code I 4
ELE 127 Residential Wiring Methods 3
Total Semester Total 7
Semester 2
Course No. Course Title Credits
ELE 132 National Electrical Code II 4
ELE 149 Wiring Methods in Industry 3
Total Semester Total 7
Total Minimum Credits 14

CAREER STUDIES: ELECTRICAL WIRING (Plan Code: 221.706.01)
The Career Studies Certificate in Electrical Wiring includes additional instruction in electrical theory and wiring methods.

Semester 1
Course No. Course Title Credits
ELE 127 Residential Wiring Methods 3
ELE 131 National Electrical Code I 4
ELE 150 A.C. and D.C. Circuit Fundamentals 3
Total Semester Total 10
Semester 2
Course No. Course Title Credits
ELE 132 National Electrical Code II 4
ELE 146 Electric Motor Control 4
ELE 148 Power Distribution Systems 3
ELE 149 Wiring Methods in Industry 3
Total Semester Total 14
Total Minimum Credits 24
CAREER STUDIES: FIBER AND DATA CABLING INSTALLATION
(Plan Code: 221.706.30)

The Career Studies Certificate in Fiber and Data Cabling Installation prepares students for careers in the maintenance, testing, troubleshooting and repair of fiber, data, and video network systems. Students who complete this program will be prepared to take the industry- and manufacturer-specific certification exams for Fiber and Data Cabling.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELE 131</td>
<td>National Electrical Code I</td>
<td>4</td>
</tr>
<tr>
<td>ELE 174</td>
<td>Fiber Optic Connections</td>
<td>3</td>
</tr>
<tr>
<td>ELE 189</td>
<td>Data Cabling Communication</td>
<td>3</td>
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<tr>
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Semester 2

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 150</td>
<td>A.C. and D.C. Circuit Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>Approved ELE Elective¹</td>
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<tr>
<td>Semester Total</td>
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<td>16</td>
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</tbody>
</table>

¹ Approved ELE Electives:
- ELE 179 - Satellite Dish Installation
- ELE 250 - Fiber Optics Technology

CAREER STUDIES: RENEWABLE ENERGY TECHNOLOGIES
(Plan Code: 221.706.40)

The Career Studies Certificate in Renewable Energy Technologies prepares students for careers in the design, installation, and maintenance of alternative energy systems. Students who complete this program will be prepared to take industry- and manufacturer-specific certification exams for Renewable Energies Integrator Installer.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELE 131</td>
<td>National Electrical Code I</td>
<td>4</td>
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<tr>
<td>ELE 150</td>
<td>A.C. and D.C. Circuit Fundamentals</td>
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Semester 2

<table>
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<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>ENE 110</td>
<td>Solar Power Installations</td>
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<tr>
<td>ENE 120</td>
<td>Solar Power - Photovoltaic and Thermal</td>
<td>4</td>
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<td>SAF 127</td>
<td>Industrial Safety</td>
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<tr>
<td>Semester Total</td>
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</table>

ELECTRONICS TECHNOLOGY

Associate of Applied Science Degree:
- Electronics Technology

Certificate:
- Electronics Engineering Technology

The Electronics Technology programs are designed to prepare students for entry into or continued employment in electronics. Graduates are prepared for positions such as communication, computer, electrical, or electronics technicians; electrical or electronics engineers; and similar roles.

Under a formal articulation agreement with Old Dominion University (ODU), and with appropriate course substitutions, students may transfer course work into a related baccalaureate degree program. Students interested in transferring should see the program head early in their academic plan and consult ODU’s catalog, transfer guide, and website for additional information.

ASSOCIATE OF APPLIED SCIENCE DEGREE: ELECTRONICS TECHNOLOGY
(Plan Code: 981)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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</tr>
<tr>
<td>ETR 104</td>
<td>Electronic Fundamentals with Computer Applications</td>
<td>4</td>
</tr>
<tr>
<td>MTH 166</td>
<td>Precalculus with Trigonometry</td>
<td>5</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
<td>1</td>
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<tr>
<td>Approved Humanities Elective¹</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Semester Total</td>
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<td>16</td>
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</table>

¹ Approved Electrical and Energy Electives:
- ELE 188 - Geothermal Technology for Electricians
- ENE 100 - Conventional and Alternate Energy Applications
- ENE 225 - Commercial/Industrial Photovoltaic Design and Installation
### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
<tr>
<td>ETR 113</td>
<td>D.C. and A.C. Fundamentals I</td>
<td>4</td>
</tr>
<tr>
<td>ETR 279</td>
<td>Digital Principles, Terminology and Applications</td>
<td>4</td>
</tr>
<tr>
<td>MTH 173</td>
<td>Calculus with Analytic Geometry I</td>
<td>5</td>
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</table>

**Semester Total** 16

### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ETR 114</td>
<td>D.C. and A.C. Fundamentals II</td>
<td>4</td>
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<tr>
<td>ETR 148</td>
<td>Amplifiers and Integrated Circuits</td>
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<tr>
<td>PHY 201</td>
<td>General College Physics I</td>
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<tr>
<td>Health/Physical Education Elective&lt;sup&gt;1&lt;/sup&gt;</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Social Science Elective&lt;sup&gt;2&lt;/sup&gt;</td>
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**Semester Total** 17

### Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ETR 250</td>
<td>Solid State Circuits</td>
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<tr>
<td>ETR 261</td>
<td>Microprocessor Application I</td>
<td>4</td>
</tr>
<tr>
<td>ETR 297</td>
<td>Cooperative Education (or Approved Elective&lt;sup&gt;3&lt;/sup&gt;)</td>
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<tr>
<td>PHY 202</td>
<td>General College Physics II</td>
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</table>

**Semester Total** 16

**Total Minimum Credits** 65

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1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. Approved elective must be one of the following: ETR 174, EGR 125, or CHM 111.

3. ETR 174 may be substituted for ETR 261.

4. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED<sup>1</sup> (any activity course).

---

**CERTIFICATE: ELECTRONICS ENGINEERING TECHNOLOGY**

(Plan Code 968)

The Certificate in Electronics Engineering Technology prepares students for entry-level electronics technician positions or assists students with advancement within the field.

### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>ETR 104</td>
<td>Electronic Fundamentals with Computer Applications</td>
<td>4</td>
</tr>
<tr>
<td>MTH 166</td>
<td>Precalculus with Trigonometry</td>
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</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
<td>1</td>
</tr>
</tbody>
</table>

**Semester Total** 13

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**EMERGENCY MEDICAL SERVICES**

**Associate of Applied Science Degree:**

- Emergency Medical Services

**Career Studies Certificates:**

- Critical Care
- Emergency Medical Technician – Intermediate
- Emergency Medical Technician – Paramedic

The programs in Emergency Medical Services (EMS) prepare students for work in areas such as hospitals, fire-rescue, military, volunteer services, nursing homes, sports organizations, cruise ship lines, and other fields that require emergency services.

The programs meet the National EMS Education Standards and are approved by the Virginia Office of Emergency Medical Services, the National Registry of Emergency Medical Technicians, and the Committee on Accreditation of Educational Programs for EMS Professions (CoAEMSP) through the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

The Associate of Applied Science (A.A.S) in Emergency Medical Services provides comprehensive education necessary to provide advanced emergency medical care for patients accessing emergency medical services. Clinical and field internships are key components of this program since they offer students opportunities to experience the role of emergency service provider in various settings.
Admission to the A.A.S. program requires a general college application. If admitted, students must meet certain conditions for continuance. For further information, go to www.tcc.edu (search keywords “emergency medical services”).

ASSOCIATE OF APPLIED SCIENCE DEGREE: EMERGENCY MEDICAL SERVICES (Plan Code: 146)

Semester 1

<table>
<thead>
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<td>EMS 111</td>
<td>Emergency Medical Technician – Basic</td>
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<td>EMS 120</td>
<td>Emergency Medical Technician – Basic Clinical</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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<td>SDV 101</td>
<td>Orientation to Health Care</td>
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Semester Total 12

Semester 2

<table>
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<tbody>
<tr>
<td>EMS 151</td>
<td>Introduction to Advanced Life Support</td>
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</tr>
<tr>
<td>EMS 153</td>
<td>Basic ECG Recognition</td>
<td>2</td>
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<tr>
<td>EMS 155</td>
<td>ALS – Medical Care</td>
<td>4</td>
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<tr>
<td>EMS 170</td>
<td>ALS Internship I</td>
<td>1</td>
</tr>
<tr>
<td>EMS 121</td>
<td>Science with Lab Elective&lt;sup&gt;1&lt;/sup&gt;</td>
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</table>

Semester Total 15

Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>EMS 157</td>
<td>ALS – Trauma Care</td>
<td>3</td>
</tr>
<tr>
<td>EMS 159</td>
<td>ALS – Special Populations</td>
<td>3</td>
</tr>
<tr>
<td>EMS 172</td>
<td>ALS Clinical Internship II</td>
<td>1</td>
</tr>
<tr>
<td>EMS 173</td>
<td>ALS Field Internship II</td>
<td>1</td>
</tr>
<tr>
<td>EMS 256</td>
<td>12 Lead ECG Interpretation&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1</td>
</tr>
<tr>
<td>EMS 112</td>
<td>Humanities/Social Science Elective&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3</td>
</tr>
<tr>
<td>(or ENG 112, CST 100, or CST 110)</td>
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</table>

Semester Total 12

Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
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</thead>
<tbody>
<tr>
<td>EMS 201</td>
<td>EMS Professional Development</td>
<td>3</td>
</tr>
<tr>
<td>EMS 205</td>
<td>Advanced Pathophysiology</td>
<td>4</td>
</tr>
<tr>
<td>EMS 207</td>
<td>Advanced Patient Assessment</td>
<td>3</td>
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<tr>
<td>EMS 242</td>
<td>ALS Clinical Internship III</td>
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<td>EMS 243</td>
<td>ALS Field Internship III</td>
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Semester Total 12

Semester 5

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<tr>
<td>EMS 209</td>
<td>Advanced Pharmacology</td>
<td>4</td>
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<tr>
<td>EMS 211</td>
<td>Operations</td>
<td>2</td>
</tr>
<tr>
<td>EMS 244</td>
<td>ALS Clinical Internship IV</td>
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<tr>
<td>EMS 245</td>
<td>ALS Field Internship IV</td>
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<tr>
<td>EMS 255</td>
<td>Concepts in Critical Care</td>
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</tbody>
</table>

Semester Total 14

Total Minimum Credits 65

<sup>1</sup> Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

<sup>2</sup> Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

CAREER STUDIES: CRITICAL CARE (Plan Code: 221.146.10)

The Career Studies Certificate in Critical Care prepares individuals to work in critical care environments, including flight and ground transport areas, as well as critical care units in hospitals. The program is available to registered nurses and paramedics who wish to enhance their training in patient critical care. Upon completion of the certificate, nurses may take the Critical Care Nurses Exam (CCRN) and paramedics may take the Flight Paramedic exam, as added credentials in their work.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS 209</td>
<td>Advanced Pharmacology</td>
<td>4</td>
</tr>
<tr>
<td>EMS 205</td>
<td>Advanced Pathophysiology</td>
<td>3</td>
</tr>
<tr>
<td>EMS 244</td>
<td>ALS Clinical Internship IV</td>
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<tr>
<td>EMS 255</td>
<td>Concepts in Critical Care</td>
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</table>

Semester Total 10

Total Minimum Credits 19
CAREER STUDIES: EMERGENCY MEDICAL TECHNICIAN-INTERMEDIATE  (Plan Code: 221.146.03)

The Career Studies Certificate in Emergency Medical Technician – Intermediate is designed for those seeking work in hospital emergency medicine, fire-rescue, military, and ambulance environments. Those who complete the certificate may take the National Registry EMT-Intermediate certification exam. They may also be eligible to take the Virginia EMT-Enhanced exam. Note: Students entering this program must possess a current EMT/B certification.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EMS 151</td>
<td>Introduction to Advanced Life Support</td>
<td>4</td>
</tr>
<tr>
<td>EMS 153</td>
<td>Basic ECG Recognition</td>
<td>2</td>
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<tr>
<td>EMS 155</td>
<td>ALS – Medical Care</td>
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</tr>
<tr>
<td>EMS 170</td>
<td>ALS Internship I</td>
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Semester 2

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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EMS 157</td>
<td>ALS – Trauma Care</td>
<td>3</td>
</tr>
<tr>
<td>EMS 159</td>
<td>ALS – Special Populations</td>
<td>3</td>
</tr>
<tr>
<td>EMS 172</td>
<td>ALS Clinical Internship II</td>
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</tr>
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<td>EMS 173</td>
<td>ALS Field Internship II</td>
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<td><strong>Total Minimum Credits</strong></td>
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</table>

CAREER STUDIES: EMERGENCY MEDICAL TECHNICIAN-PARAMEDIC  (Plan Code: 221.146.05)

The Career Studies Certificate in Emergency Medical Technician – Paramedic prepares students to function as advanced life support providers, and to progress to the highest level in their field. Upon completion of the certificate, students may take the National Registry EMT-Paramedic exam. Note: Students entering the program must have completed the Career Studies Certificate in Emergency Medical Technician–Intermediate, or have a comparable background in emergency services.

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BUS 100</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 111</td>
<td>Principles of Supervision I</td>
<td>3</td>
</tr>
<tr>
<td>FIN 115</td>
<td>Personal Investments</td>
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<tr>
<td>MKT 260</td>
<td>Customer Service Management</td>
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<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
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<tr>
<td>BUS 117</td>
<td>Leadership Development</td>
<td>3</td>
</tr>
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<td>BUS 236</td>
<td>Communication in Management</td>
<td>3</td>
</tr>
<tr>
<td>FIN 110</td>
<td>Principles of Banking</td>
<td>3</td>
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<td><strong>Semester Total</strong></td>
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</tr>
<tr>
<td><strong>Total Minimum Credits</strong></td>
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<td><strong>24</strong></td>
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</tbody>
</table>

** Discontinuance pending College Board approval.
FIRE SCIENCE TECHNOLOGY

Associate of Applied Science Degree:
- Fire Science Technology

Career Studies Certificate:
- Fire Science Supervision

The Fire Science Technology programs prepare individuals for work as fire administrators, arson investigators, fire training coordinators, safety directors, state training coordinators, municipal department administrators, fire insurance appraisers, and fire equipment salespersons. The programs are aimed at firefighters who seek advancement and wish to broaden their knowledge of the field.

Students are advised to consult with the program coordinator prior to entering the program.

ASSOCIATE OF APPLIED SCIENCE DEGREE:
FIRE SCIENCE TECHNOLOGY

(Plan Code: 427)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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<tr>
<td>FST 100</td>
<td>Principles of Emergency Services</td>
<td>3</td>
</tr>
<tr>
<td>FST 110</td>
<td>Fire Behavior and Combustion</td>
<td>3</td>
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<tr>
<td>SDV 100</td>
<td>College Success Skills (or SDV 101 or SDV 108)</td>
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<tr>
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<td>Mathematics Elective 2</td>
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Semester 2

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<th>Course Title</th>
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<tr>
<td>ENG 112</td>
<td>College Composition II</td>
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<tr>
<td>FST 112</td>
<td>Hazardous Materials Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>FST 115</td>
<td>Fire Prevention</td>
<td>3</td>
</tr>
<tr>
<td>FST 120</td>
<td>Occupational Safety and Health for the Fire Service</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
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<td>Semester Total</td>
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Semester 3

<table>
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<tbody>
<tr>
<td>FST 121</td>
<td>Principles of Fire and Emergency</td>
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<tr>
<td></td>
<td>Services Safety and Survival</td>
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<tr>
<td>FST 205</td>
<td>Fire Protection Hydraulics and Water Supply</td>
<td>3</td>
</tr>
<tr>
<td>FST 210</td>
<td>Legal Aspects of Fire Service</td>
<td>3</td>
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<tr>
<td>FST 220</td>
<td>Building Construction for Fire Protection</td>
<td>3</td>
</tr>
<tr>
<td>FST 230</td>
<td>Fire Investigation</td>
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Semester 4

<table>
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<th>Course Title</th>
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<tbody>
<tr>
<td>FST 215</td>
<td>Fire Protection Systems</td>
<td>3</td>
</tr>
<tr>
<td>FST 235</td>
<td>Strategy and Tactics</td>
<td>3</td>
</tr>
<tr>
<td>FST 240</td>
<td>Fire Administration</td>
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<td>Health/Physical Education Elective 3</td>
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<td>Social Science Elective 1</td>
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<td></td>
<td>Total Minimum Credits</td>
<td>65</td>
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</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Any 100 level math or higher.

3 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

NOTES:
- It is recommended that at the time of graduation all students have a current Emergency Medical Technicians Certificate.
- It is highly recommended that all students meet with or talk to the program coordinator before beginning the program.
- TCC has an articulation agreement with ODU. Recent changes to the curriculum have made it easier for students to transfer from TCC to this or any other four-year program.
- For additional information regarding the Fire Science Technology program, see http://faculty.tcc.edu/RDienst/.

CAREER STUDIES: FIRE SCIENCE SUPERVISION

(Plan Code: 221.427.05)

The Career Studies Certificate in Fire Science Supervision is designed for students interested in the management and administration of the fire protection career field. Students seeking promotion may also wish to pursue this program as a means of enhancing their credentials.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>FST 120</td>
<td>Occupational Safety &amp; Health for the Fire Service</td>
<td>3</td>
</tr>
<tr>
<td>FST 135</td>
<td>Fire Instructor 1</td>
<td>3</td>
</tr>
<tr>
<td>FST 210</td>
<td>Legal Aspects of Fire Service</td>
<td>3</td>
</tr>
<tr>
<td>FST 220</td>
<td>Building Construction for Fire Protection</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FST 140</td>
<td>Fire Officer 1</td>
<td>4</td>
</tr>
<tr>
<td>FST 235</td>
<td>Strategy and Tactics</td>
<td>3</td>
</tr>
<tr>
<td>FST 237</td>
<td>Emergency Service Supervision 1</td>
<td>3</td>
</tr>
<tr>
<td>FST 240</td>
<td>Fire Administration</td>
<td>3</td>
</tr>
<tr>
<td>FST 297</td>
<td>Cooperative Education in Fire Science 3</td>
<td>4</td>
</tr>
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<td>Semester Total</td>
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</tr>
<tr>
<td></td>
<td>Total Minimum Credits</td>
<td>29</td>
</tr>
</tbody>
</table>
1. Must be a state certified Firefighter I and II.

2. Must complete FST 135 prior to taking.

3. Objectives will be predetermined by the fire department.

NOTES:
- FST 135, FST 140, FST 237, and FST 297 can be used to substitute for existing requirements in the A.A.S. degree in Fire Science Technology.
- FST 135 will fulfill the academic portion of your state certification requirements for Fire Instructor I through the Virginia Department of Fire Programs (VDFP).
- FST 140 will award state certification as a Fire Officer I through VDFP.
- FST 237 will award state certification as a Crew Leader through VDFP.

FUNERAL SERVICE

Associate of Applied Science Degree:
- Funeral Service

The Associate of Applied Science (A.A.S.) degree in Funeral Service provides an extensive program designed to prepare students for careers in the field of mortuary science. A diversified curriculum addresses the changing needs and demands of contemporary funeral directing, embalming, and business management.

Entrance requirements for this program include: graduation from high school or completion of the GED and submission of high school transcript or GED certificate; placement into ENG 111; Placement into MTE 5 or higher; successful completion (grades of C or better) of ACC 211, CHM 110, and FNS 121. Students are also expected to have begun or declined in writing the Hepatitis-B series of shots upon entering FNS 111 and 112.

Transcripts from other colleges attended must be sent to Tidewater Community College, Central Records Office/Office of the College Registrar, P.O. Box 9000, Norfolk, Virginia, 23509. These transcripts must be evaluated before any transfer credit is granted prior to the application deadline. Credit will not be granted for courses taken five years or more prior to the date of enrollment. Credit will only be granted for FNS courses taken at institutions accredited by the American Board of Funeral Service Education www.abfse.org.

Following acceptance into the program, students must maintain a C or better in all FNS courses and in (SOC 201 or SOC 246) and PSY 116. Students will be required to have completed twenty-four credit hours in order to enroll in FNS 111, 112, 113, 114, 211, 212, 231, and 232. In order to take the second part of sequenced courses, a grade of C or better must be earned in the initial course.

Individuals in the Funeral Service program are required to complete the National Board Examination (NBE) prior to graduation.


In order to receive a Funeral Service license in the Commonwealth of Virginia, an individual must: (1) complete an accredited program of mortuary science; (2) pass the National Board Examination; (3) complete a 3,000 hour apprenticeship; and (4) pass the State examination. Completion of the National Board Examination (NBE) is a requirement for graduation from the TCC Funeral Service program. The cost of the exam is $500. The annual passage rate for first-time takers on the National Board Examination and all American Board of Funeral Service Education accredited schools is posted on the ABFSE website www.abfse.org.

Aims and Objectives
- To maintain a high level of post-secondary education designed to prepare students for successful careers as funeral service professionals.
- To provide an extensive curriculum designed to address all aspects of funeral service, thereby helping students develop a level of skill and proficiency necessary to compete in this ever-changing field.
- To instill in students the desire and knowledge to serve the public with the highest ethical standards.
- To encourage and provide a forum where students and industry professionals may conduct research related to funeral service.
- To promote a positive image of the profession and its practitioners.
- To serve the funeral service community by providing continuing education and life-long learning.
- To make students ever mindful of their responsibilities to the profession and the clients they serve.
- To encourage students to contribute to the community in which they serve by providing outstanding service, while cognizant of all regulatory issues pertinent to the health, public safety, and “care of the deceased”.

Upon completion of the program, graduates will be able to: (1) demonstrate proper embalming and restoration techniques with minimum supervision; (2) demonstrate an understanding of the effects of disease and the importance of sanitation in the handling of human remains; (3) apply ethical and management principles to all aspects of making funeral arrangements with minimum supervision; (4) demonstrate an understanding of how to write pre-need and at-need contracts; (5) direct a funeral with minimum supervision; (6) and set up and maintain an OSHA...
approved preparation room; adhere to federal guidelines set up by the Federal Trade Commission (FTC) and Occupational Safety and Health Administration (OSHA) with minimal supervision.

ASSOCIATE OF APPLIED SCIENCE DEGREE: FUNERAL SERVICE (Plan Code: 155)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
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<tr>
<td>CHM 110</td>
<td>Survey of Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>FNS 121</td>
<td>Anatomy for Funeral Service I</td>
<td>3</td>
</tr>
<tr>
<td>PSY 116</td>
<td>Psychology of Death and Dying</td>
<td>3</td>
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<td>SDV 100</td>
<td>College Success Skills</td>
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<tr>
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<td>16</td>
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Semester 2

<table>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>FNS 125</td>
<td>Microbiology for Funeral Service</td>
<td>3</td>
</tr>
<tr>
<td>HLT 143</td>
<td>Medical Terminology I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
</tr>
<tr>
<td>SOC 201</td>
<td>Introduction to Sociology I</td>
<td>3</td>
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<td>Health/Physical Education Elective1</td>
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Semester 3

<table>
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<th>Course Title</th>
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<tbody>
<tr>
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<td>Introduction to Funeral Service</td>
<td>2</td>
</tr>
<tr>
<td>FNS 111</td>
<td>Theory of Embalming I</td>
<td>3</td>
</tr>
<tr>
<td>FNS 113</td>
<td>Theory of Embalming Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>FNS 126</td>
<td>Pathology for Funeral Service</td>
<td>3</td>
</tr>
<tr>
<td>FNS 211</td>
<td>Restorative Art I</td>
<td>3</td>
</tr>
<tr>
<td>FNS 231</td>
<td>Principles of Funeral Management I</td>
<td>4</td>
</tr>
<tr>
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<td>16</td>
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Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
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<td>Theory of Embalming Laboratory II</td>
<td>1</td>
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<tr>
<td>FNS 212</td>
<td>Restorative Art II</td>
<td>3</td>
</tr>
<tr>
<td>FNS 232</td>
<td>Principles of Funeral Management II</td>
<td>4</td>
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<tr>
<td>FNS 236</td>
<td>Funeral Service Law</td>
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<td>FNS 270</td>
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<td></td>
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</tr>
</tbody>
</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. Additional fees associated with this course: $500 - National Board Exam; $100 - Practice National Board Exam (NBE); and $180 - Computerized Testing Program. (Fees subject to change.)

GRAPHIC DESIGN

ASSOCIATE OF APPLIED SCIENCE DEGREE: GRAPHIC DESIGN (Plan Code: 514)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
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<tbody>
<tr>
<td>ART 131</td>
<td>Fundamentals of Design I</td>
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<tr>
<td>ART 250</td>
<td>History of Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 283</td>
<td>Computer Graphics I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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<tr>
<td></td>
<td>Health/Physical Education Elective2</td>
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Semester 2

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<tr>
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<td>ART 141</td>
<td>Typography I</td>
<td>4</td>
</tr>
<tr>
<td>ART 202</td>
<td>History of Art II</td>
<td>3</td>
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<tr>
<td>ART 284</td>
<td>Computer Graphics II</td>
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Semester 3

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<tr>
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<td>3</td>
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<td>ART 209</td>
<td>Creative Concepts and Copywriting</td>
<td>3</td>
</tr>
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<td>ART 251</td>
<td>Communication Design I</td>
<td>3</td>
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<td>HIS 111</td>
<td>History of World Civilization</td>
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</tr>
<tr>
<td>PHT 101</td>
<td>Photography I</td>
<td>3</td>
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<tr>
<td></td>
<td>Natural Science Elective2</td>
<td>3</td>
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<tr>
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<td>ART 263</td>
<td>Interactive Design I</td>
<td>4</td>
</tr>
<tr>
<td>ART 286</td>
<td>Communication Arts Workshop</td>
<td>3</td>
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<td>HIS 112</td>
<td>History of World Civilization</td>
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</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. ART 286 should be taken in the final semester before graduation and is offered in the fall and spring semesters only.

3. Students may choose from any of the listed courses for which they have the prerequisite and that is not already a requirement in their specialization: ART 122, ART 201, ART 203, ART 208, ART 251, ART 252, ART 263, ART 264, ART 270, ART 271, ART 290*, ART 297*, and PHT 135. *Requires permission of Visual Arts Center Director.

4. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

### Advertising Design

The Advertising Design specialization teaches students the computer and design skills, marketing and public relations expertise needed to work in the field of advertising—as a layout artist, a copywriter, a freelance graphic designer, or in marketing and sales.

### Associate of Applied Science Degree: Graphic Design

**Specialization: Advertising Design (Plan Code: 534.01)**

### Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 131</td>
<td>Fundamentals of Design I</td>
<td>3</td>
</tr>
<tr>
<td>ART 250</td>
<td>History of Design</td>
<td>3</td>
</tr>
<tr>
<td>ART 283</td>
<td>Computer Graphics I</td>
<td>4</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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<td>MKT 100</td>
<td>Principles of Marketing</td>
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<td>SDV 100</td>
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### Semester 2

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 121</td>
<td>Drawing I</td>
<td>3</td>
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<tr>
<td>ART 141</td>
<td>Typography I</td>
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<tr>
<td>ART 202</td>
<td>History of Art II</td>
<td>3</td>
</tr>
<tr>
<td>ART 284</td>
<td>Computer Graphics II</td>
<td>4</td>
</tr>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
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<td>Semester Total</td>
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<td>17</td>
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</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. ART 286 should be taken in the final semester before graduation and is offered in the fall and spring semesters only.

3. Students may choose from any of the listed courses for which they have the prerequisite and that is not already a requirement in their specialization: ART 201, ART 203, ART 208, ART 251, ART 252, ART 263, ART 264, ART 270, ART 271, ART 290*, ART 297*, and PHT 135. *Requires permission of Visual Arts Center Director.

4. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

### Multimedia

The Multimedia specialization prepares students to produce technologically sophisticated video and multimedia work—for the web, CD, DVD, video, and whatever comes next. The future of communication is digital—industry needs designers capable of shaping information, video and graphics and delivering it to the world. Graduates may seek employment as web page designers, motion graphic artists or interactive media designers.

### Associate of Applied Science Degree: Graphic Design

**Specialization: Multimedia (Plan Code: 534.04)**

### Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ART 131</td>
<td>Fundamentals of Design I</td>
<td>3</td>
</tr>
<tr>
<td>ART 250</td>
<td>History of Design</td>
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</table>
ART 283        Computer Graphics I        4
ENG 111        College Composition I     3
PHT 101        Photography I             3
SDV 100        College Success Skills     1
Semester Total                                      17

Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 121</td>
<td>Drawing I</td>
<td>3</td>
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<td>ART 202</td>
<td>History of Art II</td>
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<td>ART 284</td>
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<td>Semester Total                                      17</td>
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<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 121</td>
<td>Drawing I</td>
<td>3</td>
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Semester 3

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<tbody>
<tr>
<td>ART 263</td>
<td>Interactive Design I</td>
<td>4</td>
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<td>ART 209</td>
<td>Creative Concepts and Copywriting</td>
<td>3</td>
</tr>
<tr>
<td>ART 270</td>
<td>Motion Graphics I</td>
<td>3</td>
</tr>
<tr>
<td>HIS 111</td>
<td>History of World Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>Natural Science Elective1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or Mathematics Elective1</td>
<td></td>
<td></td>
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<tr>
<td>Semester Total                                      16</td>
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Semester 4

<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ART 208</td>
<td>Video Techniques</td>
<td>4</td>
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<tr>
<td>ART 264</td>
<td>Interactive Design II</td>
<td>4</td>
</tr>
<tr>
<td>ART 286</td>
<td>Communication Arts Workshop2</td>
<td>3</td>
</tr>
<tr>
<td>HIS 112</td>
<td>History of World Civilization II</td>
<td>3</td>
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<tr>
<td>Health/Physical Education Elective3</td>
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<td></td>
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<td>Total Minimum Credits                               65</td>
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</table>

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HEALTH INFORMATION MANAGEMENT

Associate of Applied Science Degree:
- Health Information Management

The Health Information Management (HIM) program can lead to careers in hospitals, nursing homes, insurance companies, consulting firms, and many other health related facilities. Graduates may seek positions as medical records technicians, coders, health information specialists, and similar designations.

Entrance requirements for this program include high school graduation or a GED, BIO 141, ENG 111, and successful completion of MTE 5 or higher. The program has a selective admission process for each fall semester cohort. Additional information about the admission process and program requirements is available online at www.tcc.edu (search keywords “HIM Program Packet”).

Individuals in the Health Information Management program may elect to pursue professional certification following completion of the A.A.S. The American Health Information Management Association (AHIMA) offers an examination toward the Registered Health Information Technician (RHIT), available to graduates of the HIM program.

The Health Information Management program is accredited by the Commission on Accreditation for Health Informatics and Information Management education (CAHIIM) 233 N. Michigan Avenue, Chicago, IL 60601-5800, (312) 233-1100, www.cahiim.org.

ASSOCIATE OF APPLIED SCIENCE DEGREE: HEALTH INFORMATION MANAGEMENT (Plan Code: 152)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIO 141</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HIM 101</td>
<td>Health Information Technology I</td>
<td>4</td>
</tr>
<tr>
<td>HLT 143</td>
<td>Medical Terminology I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Health Care</td>
<td>1</td>
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<tr>
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Semester 2

<table>
<thead>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 142</td>
<td>Human Anatomy and Physiology II</td>
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<tr>
<td>HIM 110</td>
<td>Introduction to Human Pathology</td>
<td>3</td>
</tr>
<tr>
<td>HIM 151</td>
<td>Reimbursement Issues in Medical Practice Management</td>
<td>2</td>
</tr>
<tr>
<td>HIM 220</td>
<td>Health Statistics</td>
<td>2</td>
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<tr>
<td>HIM 253</td>
<td>Health Records Coding</td>
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<tr>
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### Semester 3

<table>
<thead>
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<th>Course Title</th>
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<tbody>
<tr>
<td>HIM 103</td>
<td>Health Information Technology II</td>
<td>2</td>
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<tr>
<td>HIM 249</td>
<td>Supervision and Management Practices</td>
<td>3</td>
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<td>HIM 260</td>
<td>Pharmacology for Health Information Technology</td>
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### Semester 4

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<tr>
<td>HIM 190</td>
<td>Coordinated Internship</td>
<td>2</td>
</tr>
<tr>
<td>HIM 226</td>
<td>Legal Aspects of Health Record Documentation</td>
<td>2</td>
</tr>
<tr>
<td>HIM 229</td>
<td>Performance Improvement in Health Care Settings</td>
<td>2</td>
</tr>
<tr>
<td>HIM 254</td>
<td>Advanced Coding and Reimbursement</td>
<td>4</td>
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<tr>
<td>Health/Physical Education Elective</td>
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<tr>
<td>Social Science Elective</td>
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### Semester 5

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<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>HIM 215</td>
<td>Health Data Classification Systems</td>
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<tr>
<td>HIM 230</td>
<td>Information Systems and Technology in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>HIM 290</td>
<td>Coordinated Internship</td>
<td>3</td>
</tr>
<tr>
<td>HIM 298</td>
<td>Seminar and Project</td>
<td>2</td>
</tr>
<tr>
<td>Humanities Elective</td>
<td>3</td>
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<tr>
<td>Total Minimum Credits</td>
<td>67</td>
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</tr>
</tbody>
</table>

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**HEALTH INFORMATION/MEDICAL RECORDS TECHNOLOGY**

**Career Studies Certificate:**

- Electronic Health Records System Consulting

The Career Studies Certificate in Electronic Health Records System Consulting is designed to prepare individuals to assist health care organizations with the ever changing challenges associated with the transition to electronic health records systems. Electronic Health Records (EHRs) are the central component of the Health IT infrastructure. An EHR is an individual's official, digital health record and can be securely shared among multiple facilities and agencies. Through the use of EHRs, health providers have access to vital patient data, such as medical history, lab results, medical images and patient billing information. This discipline conveys the integration of information technology into health care to support the workflow and business objectives of health organizations.

The course sequence spans approximately six months. As this certificate program is geared toward working professionals, the courses are offered in a compressed format over two semesters.

**CAREER STUDIES: ELECTRONIC HEALTH RECORDS SYSTEM CONSULTING (Plan Code: 221.285.74)**

### Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BUS 204</td>
<td>Project Management</td>
<td>3</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 102</td>
<td>Computers and Information Systems</td>
<td>2</td>
</tr>
<tr>
<td>MKT 170</td>
<td>Customer Service</td>
<td>1</td>
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<tr>
<td>Approved Mathematics Elective</td>
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<td>Semester Total</td>
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<td></td>
</tr>
</tbody>
</table>

1 Any college-level math course appropriate to the program may be selected.

Note: This project is funded by the U.S. Department of Labor's Education and Training Administration through a grant under the Trade Adjustment Assistance Community College and Career Training Grants Program.

**HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION**

**Associate of Applied Science Degree:**

- Heating, Ventilation, Air Conditioning, and Refrigeration

**Certificate:**

- Air Conditioning and Refrigeration

The Associate of Applied Science (A.A.S.) in Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) is designed to prepare students for employment in the heating, ventilation, air conditioning, and refrigeration industry as technicians in the areas of service, maintenance, and installation. The program provides students with a comprehensive set of HVAC/R skills that area employers seek when hiring technicians. Graduates of this
program will have obtained the Environmental Protection Agency (EPA) industry certification.

Training options in specialty areas include: Residential, Commercial, Weatherization, Supervision and Management, and Energy Management. The A.A.S. degree offers students an in-depth background in HVAC/R fundamentals through theory and hands-on instruction.

**ASSOCIATE OF APPLIED SCIENCE DEGREE: HEATING, VENTILATION, AIR CONDITIONING, AND REFRIGERATION (HVAC/R) (Plan Code: 904)**

**Semester 1 (Based on a Fall Semester start)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AIR 111</td>
<td>Air Conditioning and Refrigeration Controls I</td>
<td>3</td>
</tr>
<tr>
<td>AIR 121</td>
<td>Air Conditioning and Refrigeration I</td>
<td>3</td>
</tr>
<tr>
<td>AIR 154</td>
<td>Heating Systems I</td>
<td>3</td>
</tr>
<tr>
<td>AIR 161</td>
<td>Heating, Air, and Refrigeration Calculations I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
<td>1</td>
</tr>
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</table>

**Semester Total** | **17**

**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AIR 159</td>
<td>Heating and Cooling Safety</td>
<td>1</td>
</tr>
<tr>
<td>AIR 160</td>
<td>Introduction to Indoor Air Quality</td>
<td>2</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 103</td>
<td>Customer Service</td>
<td>2</td>
</tr>
<tr>
<td>MTH 103</td>
<td>Approved Technical Mathematics I²</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>Approved Program Elective³</td>
<td>3</td>
</tr>
</tbody>
</table>

**Semester Total** | **13**

**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR 206</td>
<td>Psychrometrics</td>
<td>3</td>
</tr>
<tr>
<td>AIR 278</td>
<td>HVAC System Startup and Commissioning</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>Humanities Elective¹ (or PHI 220 or PHI 226)</td>
<td>3</td>
</tr>
<tr>
<td>MTH 103</td>
<td>Approved Technical Mathematics I²</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>Approved Program Elective³</td>
<td>3</td>
</tr>
</tbody>
</table>

**Semester Total** | **10**

**Total Minimum Credits** | **35**

---

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. A higher level of mathematics may be taken and is recommended for students planning to transfer to a four-year college or university.

3. Approved Program Electives: Choose a course mixture of 15 credits from one of the following career specialty areas of interest. All 15 elective credits must be chosen from the same career area.

   Residential: AIR 112, AIR 116, AIR 122, AIR 165, AIR 235, ARC 133, ELE 127, WEL 117
   Commercial: AIR 122, AIR 158, AIR 200, AIR 240, AIR 241, AIR 273, WEL 117
   Weatherization: AIR 163, AIR 164, AIR 168, AIR 178, AIR 179
   Supervision and Management: ACC 220, BUS 100, BUS 111, BUS 165, BUS 200, BUS 201, BUS 255, BUS 265, CST 110, IND 121
   Energy Management: AIR 240, AIR 281, AIR 282, BLD 111, ENE 100, ENG 131

**CERTIFICATE: AIR CONDITIONING AND REFRIGERATION**

(Plan Code: 903)

The Certificate in Air Conditioning and Refrigeration is aimed at those who plan to seek positions in the field of heating, ventilation, air conditioning, and refrigeration. It also provides current workers the opportunity to upgrade skills and knowledge.

The Certificate program prepares students for technician jobs working on residential or commercial air conditioning systems, or for positions as a sales representative or a control services technician.

**Semester 1**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR 111</td>
<td>Air Conditioning and Refrigeration Controls I</td>
<td>3</td>
</tr>
<tr>
<td>AIR 121</td>
<td>Air Conditioning and Refrigeration I</td>
<td>3</td>
</tr>
<tr>
<td>AIR 154</td>
<td>Heating Systems I</td>
<td>3</td>
</tr>
<tr>
<td>AIR 161</td>
<td>Heating, Air, and Refrigeration Calculations I</td>
<td>3</td>
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<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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**Semester Total** | **12**

**Semester 2**

<table>
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<th>Course Title</th>
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<tbody>
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<td>Air Conditioning and Refrigeration Controls II</td>
<td>3</td>
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<tr>
<td>AIR 122</td>
<td>Air Conditioning and Refrigeration II</td>
<td>3</td>
</tr>
<tr>
<td>AIR 161</td>
<td>Heating, Air, and Refrigeration Calculations I</td>
<td>3</td>
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<tr>
<td>MTH 103</td>
<td>Applied Technical Mathematics I²</td>
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</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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</table>

**Semester Total** | **13**

**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR 116</td>
<td>Duct Construction and Maintenance</td>
<td>2</td>
</tr>
<tr>
<td>AIR 165</td>
<td>Air Conditioning Systems I</td>
<td>3</td>
</tr>
<tr>
<td>AIR 200</td>
<td>Hydronics</td>
<td>2</td>
</tr>
<tr>
<td>AIR 206</td>
<td>Psychrometrics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Semester Total** | **10**

**Total Minimum Credits** | **35**
HORTICULTURE

Associate of Applied Science Degree:
- Horticulture

Career Studies Certificate:
- Landscape Design
- Landscape Management
- Plant Production

The Associate of Applied Science in Horticulture explores the art and science of plant cultivation and the use of ornamentals in the landscape. Students are prepared for full-time employment in a variety of green industry businesses, including landscape design and management, plant production and management (nursery, greenhouse, and retail garden center), and managerial positions with corporate, commercial and governmental entities; they may also choose self-employment in the green industry. The program is designed for those seeking a career track or for those with prior college credit in another field of study.

Classes offer hands-on, practical experience in the particular area of study. The curriculum allows students to acquire knowledge and skills in other areas that complement their horticulture studies and furthers their career objectives.

ASSOCIATE OF APPLIED SCIENCE DEGREE: HORTICULTURE
(Plan Code: 335)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HRT 110</td>
<td>Principles of Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>HRT 201</td>
<td>Landscape Plants I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
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<td>SDV 100</td>
<td>College Success Skills</td>
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Semester Total: 14

Semester 2

<table>
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<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
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<tr>
<td>HRT 125</td>
<td>Chemicals in Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>HRT 155</td>
<td>Plants and Society</td>
<td>3</td>
</tr>
<tr>
<td>HRT 202</td>
<td>Landscape Plants II</td>
<td>3</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I (or higher)</td>
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Approved HRT Elective4 3

Semester Total: 18

Semester 3

<table>
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<tr>
<th>Course No.</th>
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<tbody>
<tr>
<td>Approved Business Elective3 3</td>
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<tr>
<td>Social Science Elective2 3</td>
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Semester 4

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
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<tr>
<td>Approved Elective1 3</td>
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<tr>
<td>Approved HRT Elective4 3</td>
<td></td>
<td></td>
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<tr>
<td>Humanities Elective2 3</td>
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Semester 5

<table>
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<th>Course Title</th>
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<tr>
<td>Approved Elective1 3</td>
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<td></td>
</tr>
<tr>
<td>Approved Elective1 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HRT 298</td>
<td>Seminar and Project</td>
<td>2</td>
</tr>
<tr>
<td>SPA 160</td>
<td>Spanish for the Green Industry I</td>
<td>3</td>
</tr>
<tr>
<td>Approved Business Elective3 3</td>
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<td></td>
</tr>
<tr>
<td>Semester Total 14</td>
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<td></td>
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<tr>
<td>Total Minimum Credits 67</td>
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</tbody>
</table>

1 Must be chosen from a single Career Studies Certificate: Landscape Design, Landscape Management, or Plant Production. Consult your Horticulture program advisor.

2 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

3 Approved Business Elective may be chosen from ACC, BUS, GIS, HRT, ITE, MKT, or other small business-related course and must be approved by your Horticulture program advisor.

4 Consult your Horticulture program advisor.

LANDSCAPE DESIGN

The Career Studies Certificate in Landscape Design prepares students for entry-level positions as landscape designers in public and private sectors. Those currently in the field may choose to upgrade their skills, knowledge, and certifications in landscape design.

CAREER STUDIES: LANDSCAPE DESIGN (Plan Code: 221.335.18)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 110</td>
<td>Principles of Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>HRT 201</td>
<td>Landscape Plants I</td>
<td>3</td>
</tr>
<tr>
<td>HRT 235</td>
<td>Landscape Drawing</td>
<td>3</td>
</tr>
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</table>

Semester Total: 9
<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>HRT 150</td>
<td>Theory of Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>HRT 202</td>
<td>Landscape Plants II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 231</td>
<td>Planting Design I</td>
<td>3</td>
</tr>
<tr>
<td>HRT 227</td>
<td>Professional Landscape Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

**Semester 4**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 207</td>
<td>Plant Pest Management</td>
<td>3</td>
</tr>
<tr>
<td>HRT 227</td>
<td>Professional Landscape Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

**PLANT PRODUCTION**

The Career Studies Certificate in Plant Production prepares students for entry-level positions in greenhouses, nurseries, garden centers, and other retail and wholesale allied businesses. Those currently in the field may enter the program to upgrade their skills, knowledge, and certifications.

**CAREER STUDIES: PLANT PRODUCTION** *(Plan Code: 221.335.03)*

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 110</td>
<td>Principles of Horticulture</td>
<td>3</td>
</tr>
<tr>
<td>HRT 201</td>
<td>Landscape Plants I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 202</td>
<td>Landscape Plants II</td>
<td>3</td>
</tr>
<tr>
<td>HRT 275</td>
<td>Landscape Construction and Maintenance</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 259</td>
<td>Arboriculture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>
HOSPITALITY MANAGEMENT

Associate of Applied Science Degree:
• Hospitality Management

Career Studies Certificate:
• Lodging Management Trainee

Specialization: Food Service Management

Career Studies Certificate:
• Food Service Management Trainee

The Hospitality Management program prepares students for careers in the lodging industry in either hotel, motel, and restaurant management or food service management.

Graduates may seek employment as front office managers, guest services managers, cost control managers, purchasing directors, sales managers, assistant hotel general managers, or executive housekeepers. Courses in supervisory management, accounting, communications, marketing, cost control, and purchasing provide a comprehensive management background.

ASSOCIATE OF APPLIED SCIENCE DEGREE: HOSPITALITY MANAGEMENT (Plan Code: 775)

Semester 1 (Based on a Fall Semester start)
Course No. | Course Title                                | Credits |
----------|---------------------------------------------|---------|
ENG 111   | College Composition I                       | 3       |
HRI 154   | Principles of Hospitality Management        | 3       |
ITE 115   | Introduction to Computer Applications and Concepts | 4   |
MTH 121   | Fundamentals of Mathematics I (or higher)   | 3       |
SDV 100   | College Success Skills                      | 1       |
Humanities Elective | 3                                      |
Semester Total |                                           | 17      |

Semester 2
Course No. | Course Title                                | Credits |
----------|---------------------------------------------|---------|
AST 205   | Business Communications                      | 3       |
ENG 112   | College Composition II                      | 3       |
HRI 159   | Introduction to Hospitality Industry Computer Systems | 4   |
HRI 224   | Recipe and Menu Management                  | 3       |
HRI 241   | Supervision in the Hospitality Industry     | 3       |
Semester Total |                                           | 16      |

Semester 3
Course No. | Course Title                                | Credits |
----------|---------------------------------------------|---------|
HRI 160   | Executive Housekeeping                      | 3       |
HRI 180   | Convention Management and Service           | 3       |
HRI 235   | Marketing of Hospitality Services           | 3       |
HRI 265   | Hotel Front Office Operations               | 3       |
Social Science Elective | 3                                      |
Semester Total |                                           | 15      |

Semester 4
Course No. | Course Title                                | Credits |
----------|---------------------------------------------|---------|
ACC 220   | Accounting for Small Business               | 3       |
HRI 255   | Human Resource Management and Training for Hospitality and Tourism | 3   |
HRI 270   | Strategic Lodging Management                | 3       |
HRI 275   | Hospitality Law                             | 3       |
HRI 297   | Cooperative Education (or Business Elective) | 3   |
HRI Elective |                                           | 3       |
Semester Total |                                           | 18      |
Total Minimum Credits |                             | 66      |

1 ITE 115 satisfies the college’s computer competency requirement for graduation.
2 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).
3 Business electives include courses with the following prefixes: ACC, ACQ, AST, BUS, ECO, FIN, GIS, HRI, ITD, ITE, ITN, ITP, LGL, MKT, and REA.

CAREER STUDIES: LODGING MANAGEMENT TRAINEE
(Plan Code: 221.775.02)

The Career Studies Certificate in Lodging Management Trainee prepares individuals for management trainee positions in the lodging industry, including guest services, sales, assistants in hotels and motels, and comparable roles.

Semester 1
Course No. | Course Title                                | Credits |
----------|---------------------------------------------|---------|
HRI 154   | Principles of Hospitality Management        | 3       |
HRI 160   | Executive Housekeeping                      | 3       |
HRI 180   | Convention Management and Service           | 3       |
HRI 265   | Hotel Front Office Operations               | 3       |
Semester Total |                                           | 12      |

Semester 2
Course No. | Course Title                                | Credits |
----------|---------------------------------------------|---------|
ACC 220   | Accounting for Small Business               | 3       |
HRI 235   | Marketing of Hospitality Services           | 3       |
HRI 241   | Supervision in the Hospitality Industry     | 3       |
HRI 270   | Strategic Lodging Management                | 3       |
HRI 275   | Hospitality Law                             | 3       |
Semester Total |                                           | 15      |
Total Minimum Credits |                             | 27      |
FOOD SERVICE MANAGEMENT

The Food Service Management program focuses on principles of restaurant, catering, and hotel food and beverage management. Graduates may seek positions such as banquet managers, restaurant general managers, hotel catering managers, and others.

ASSOCIATE OF APPLIED SCIENCE DEGREE: HOSPITALITY MANAGEMENT

**Specialization:** Food Service Management (Plan Code: 775.02)

<table>
<thead>
<tr>
<th>Semester 1 (Based on a Fall Semester start)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course No.</strong></td>
</tr>
<tr>
<td>HRI 119</td>
</tr>
<tr>
<td>HRI 154</td>
</tr>
<tr>
<td>HRI 158</td>
</tr>
<tr>
<td>ITE 115</td>
</tr>
<tr>
<td>MTH 121</td>
</tr>
<tr>
<td>SDV 100</td>
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**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HRI 159</td>
<td>Introduction to Hospitality Industry Computer Systems</td>
<td>4</td>
</tr>
<tr>
<td>HRI 224</td>
<td>Recipe and Menu Management</td>
<td>3</td>
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<tr>
<td>HRI 241</td>
<td>Supervision in the Hospitality Industry</td>
<td>3</td>
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<tr>
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<td>Humanities Elective²</td>
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**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AST 205</td>
<td>Business Communications</td>
<td>3</td>
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<tr>
<td>HRI 215</td>
<td>Food Purchasing</td>
<td>3</td>
</tr>
<tr>
<td>HRI 235</td>
<td>Marketing of Hospitality Services</td>
<td>3</td>
</tr>
<tr>
<td>HRI 257</td>
<td>Catering Management</td>
<td>3</td>
</tr>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
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**Semester 4**

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<th>Course Title</th>
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<tbody>
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<td>ACC 220</td>
<td>Accounting for Small Business</td>
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</tr>
<tr>
<td>HRI 251</td>
<td>Food and Beverage Cost Control I</td>
<td>3</td>
</tr>
<tr>
<td>HRI 255</td>
<td>Human Resource Management and Training for Hospitality and Tourism</td>
<td>3</td>
</tr>
<tr>
<td>HRI 275</td>
<td>Hospitality Law</td>
<td>3</td>
</tr>
<tr>
<td>HRI 297</td>
<td>Cooperative Education (or Business Elective³)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective²</td>
<td>3</td>
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</tr>
<tr>
<td><strong>Total Minimum Credits</strong></td>
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<td>66</td>
</tr>
</tbody>
</table>

1. ITE 115 satisfies the college’s computer competency requirement for graduation.
2. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).
3. Business electives include courses with the following prefixes: ACC, ACQ, AST, BUS, ECO, FIN, GIS, HRI, ITD, ITE, ITN, ITF, LGL, MKT, and REA.

CAREER STUDIES: FOOD SERVICE MANAGEMENT TRAINEE

(Plan Code: 221.241.64)

The Career Studies Certificate in Food Service Management Trainee is designed for individuals who seek management trainee positions in all the food service industries, including restaurants, catering, and hotel and motel food services.

<table>
<thead>
<tr>
<th>Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course No.</strong></td>
</tr>
<tr>
<td>HRI 119</td>
</tr>
<tr>
<td>HRI 154</td>
</tr>
<tr>
<td>HRI 158</td>
</tr>
<tr>
<td>HRI 215</td>
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<tr>
<td>MTH 121</td>
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<tr>
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</tbody>
</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRI 224</td>
<td>Recipe and Menu Management</td>
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<tr>
<td>HRI 241</td>
<td>Supervision in the Hospitality Industry</td>
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<td>HRI 251</td>
<td>Food and Beverage Cost Control I</td>
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1. HRI Approved Electives:
   - HRI 235 – Marketing of Hospitality Services
   - HRI 255 – Human Resource Management and Training for Hospitality and Tourism
   - HRI 257 – Catering Management
   - HRI 275 – Hospitality Law
   - HRI 290/297 – Coordinated Internship in HRI or Cooperative Education in HRI
HUMAN SERVICES

Associate of Applied Science Degree:
- Human Services

The Associate of Applied Science (A.A.S.) degree in Human Services is designed to provide the education and training necessary for entry-level employment and career advancement in human and social services. Students obtain education and training in observation, intake and interviewing, implementing treatment plans, problem-solving, crisis intervention, case management, and referral procedures.

Graduates may seek employment as human services workers, case management aides, social work assistants, community support workers, mental health aides, community outreach workers, life skills counselors, or gerontology aides. These positions typically work under the direction of individuals in fields such as nursing, psychiatry, psychology, rehabilitative or physical therapy, and social work.

ASSOCIATE OF APPLIED SCIENCE DEGREE: HUMAN SERVICES (Plan Code: 480)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
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<tr>
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<tr>
<td>HMS 100</td>
<td>Introduction to Human Services</td>
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<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
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<tr>
<td>PSY 201</td>
<td>Introduction to Psychology I</td>
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<td>College Success Skills</td>
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<td>SOC 201</td>
<td>Introduction to Sociology I</td>
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Semester 2

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<td>HLT 110</td>
<td>Concepts of Personal and Community Health</td>
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<td>HMS 141</td>
<td>Group Dynamics I</td>
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<td>HMS 250</td>
<td>Principles of Case Management</td>
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<td>MTH 121</td>
<td>Fundamentals of Mathematics I</td>
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<td>PBS 265</td>
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Semester 3

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<td>Case Management and Substance Abuse</td>
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<td>HMS 290</td>
<td>Coordinated Internship in HMS</td>
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PHI 226 Social Ethics 3
PSY 230 Developmental Psychology 3
Semester Total 15
Semester 4

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<td>PSY 216</td>
<td>Social Psychology</td>
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<td>SOC 268</td>
<td>Social Problems</td>
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<td>CST 110</td>
<td>Introduction to Communication</td>
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<td><strong>Total Minimum Credits</strong></td>
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1 Approved Human Services Electives:
- ADU 232 – Domestic Violence
- CHD 210 – Introduction to Exceptional Children
- HMS 226 – Helping Across Cultures
- HMS 227 – The Helper as a Change Agent
- HMS 236 – Gerontology
- PSY 215 – Abnormal Psychology
- PSY 255 – Psychological Aspects of Criminal Behavior
- SOC 215 – Sociology of the Family

INDUSTRIAL TECHNOLOGY

Associate of Applied Science Degree:
- Industrial Technology

Career Studies Certificate:
- Industrial Management

Specialization: Industrial Maintenance Technology

Career Studies Certificate:
- Industrial Maintenance

Specialization: Industrial Manufacturing Engineering Technology

Specialization: Industrial Supervision

Career Studies Certificate:
- Industrial Supervision

Specialization: Occupational Safety

Career Studies Certificate:
- Occupational Safety

Specialization: Quality Assurance

Career Studies Certificate:
- Quality Assurance
The varied programs in Industrial Technology prepare students for entry-level employment in manufacturing, engineering, and industrial services companies. Graduates will be prepared for a variety of jobs in the industrial, manufacturing, or production companies as well as federal, state, and local governments.

The curriculum presented below is designed to prepare “management-oriented technical professionals” with the practical knowledge, skills, and training to compete effectively for entry-level positions in industrial manufacturing and engineering services companies.

Graduates will be prepared for the following job opportunities: industrial or manufacturing supervisory technician, production planning technician, methods engineering technician, materials-handling technician, wage and job evaluation technician, or plant layout technician.

**ASSOCIATE OF APPLIED SCIENCE DEGREE: INDUSTRIAL TECHNOLOGY (Plan Code: 963)**

**Semester 1 (Based on a Fall Semester start)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
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<td>IND 106</td>
<td>Industrial Engineering Technology</td>
<td>3</td>
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<tr>
<td>IND 121</td>
<td>Industrial Supervision I</td>
<td>3</td>
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<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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**Semester 2**

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<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>IND 115</td>
<td>Materials and Processes of Industry</td>
<td>4</td>
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<tr>
<td>IND 145</td>
<td>Introduction to Metrology</td>
<td>3</td>
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<tr>
<td>IND 146</td>
<td>Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>IND 237</td>
<td>Fundamentals of ISO 9000</td>
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<td>MTH 163</td>
<td>Precalculus I</td>
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**Semester 3**

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<td>Team Concepts and Problem Solving</td>
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<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
<td>3</td>
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<td>Approved IND Elective</td>
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<td></td>
<td>Health/Physical Education Elective</td>
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<td>Social Science Elective</td>
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**Semester 4**

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<tr>
<td>BUS 204</td>
<td>Project Management</td>
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<td>IND 150</td>
<td>Industrial Management</td>
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<td></td>
<td>Health/Physical Education Elective</td>
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<td>Humanities Elective</td>
<td>3</td>
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<td></td>
<td>Social Science Elective</td>
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**CAREER STUDIES: INDUSTRIAL MANAGEMENT (Plan Code: 221.991.16)**

The Career Studies Certificate in Industrial Management is focused on technical communication, materials and processes of industry, industrial robotics, plant layout and material handling, and ISO 9000 organizational knowledge. This program is designed for those with previous work experience. Those who complete the program may seek employment as an industrial/manufacturing technician, project engineering technician, materials-handling technician, wage and job technician, or plant layout technician.

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>IND 106</td>
<td>Industrial Engineering Technology</td>
<td>3</td>
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<tr>
<td>IND 115</td>
<td>Materials and Processes of Industry</td>
<td>4</td>
</tr>
<tr>
<td>IND 160</td>
<td>Introduction to Robotics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved IND Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved IND Elective</td>
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1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Consult with the program head or counselor. Courses must be approved by the appropriate academic dean.

3 ITE 115 satisfies the college’s computer competency requirements for graduation.

4 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLIT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).
INDUSTRIAL MAINTENANCE TECHNOLOGY
This program is designed to provide training for students working in industrial maintenance, providing them with skills in managerial techniques of supervision, process management control, quality assurance, and project management.

Graduates will be prepared for the following job opportunities: plant maintenance coordinator, equipment maintenance coordinator, production-planning maintenance technician, or maintenance supervisor in a shipyard, manufacturing or assembly operation, or warehousing environment.

ASSOCIATE OF APPLIED SCIENCE DEGREE: INDUSTRIAL TECHNOLOGY

Specialization: Industrial Maintenance Technology

(Plan Code: 963.10)

Semester 1 (Based on a Fall Semester start)

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<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
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<tr>
<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
<td>3</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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Semester 2

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<tr>
<td>IND 115</td>
<td>Materials and Processes of Industry</td>
<td>4</td>
</tr>
<tr>
<td>IND 145</td>
<td>Introduction to Metrology</td>
<td>3</td>
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<tr>
<td>IND 146</td>
<td>Statistical Quality Control</td>
<td>3</td>
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<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts³</td>
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<td>MTH 164</td>
<td>Precalculus II</td>
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Semester 3

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<tr>
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<td>Industrial Management</td>
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<tr>
<td>IND 165</td>
<td>Principles of Industrial Technology I</td>
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<td>SAF 135</td>
<td>Safety Program Organization and Administration</td>
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Semester 4

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<tr>
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<tr>
<td>IND 105</td>
<td>Nondestructive Inspection (NDI) and Testing</td>
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<tr>
<td>IND 166</td>
<td>Principles of Industrial Technology II</td>
<td>4</td>
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<tr>
<td></td>
<td>Health/Physical Education Elective⁴</td>
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<td>Humanities Elective</td>
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CAREER STUDIES: INDUSTRIAL MAINTENANCE

(Plan Code: 221.990.00)

The Career Studies Certificate in Industrial Maintenance is focused on machine blueprint reading, safety standards, and industry materials. This program is designed for those with previous work experience. Those who complete the program may seek employment as maintenance technicians and industrial engineering technicians.

Semester 1

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<td>Machine Blueprint Reading</td>
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<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
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<td>SAF 297</td>
<td>Cooperative Education</td>
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<td>Orientation to Engineering and Technologies</td>
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Semester 2

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<tbody>
<tr>
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1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Consult with the program head or counselor. Courses must be approved by the appropriate academic dean.

3 ITE 115 satisfies the college’s computer competency requirements for graduation.

4 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).
INDUSTRIAL MANUFACTURING ENGINEERING TECHNOLOGY

This program is designed for those interested in working in the manufacturing industry as production planning supervisory technicians, methods engineering supervisory technicians, robotic supervisory technicians, or computer control programmer and operator supervisor.

ASSOCIATE OF APPLIED SCIENCE DEGREE: INDUSTRIAL TECHNOLOGY

Specialization: Industrial Manufacturing Engineering Technology (Plan Code: 963.06)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
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<td>College Composition I</td>
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</tr>
<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
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<tr>
<td>IND 145</td>
<td>Introduction to Metrology</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
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<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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Semester 2

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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>IND 115</td>
<td>Materials and Processes of Industry</td>
<td>4</td>
</tr>
<tr>
<td>IND 146</td>
<td>Statistical Quality Control</td>
<td>3</td>
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<tr>
<td>IND 160</td>
<td>Introduction to Robotics</td>
<td>3</td>
</tr>
<tr>
<td>MTH 164</td>
<td>Precalculus II</td>
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Semester 3

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<td>IND 251</td>
<td>Automated Manufacturing Systems I</td>
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<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
<td>3</td>
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<td>Approved IND Elective</td>
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Semester 4

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<tbody>
<tr>
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<td>Industrial Management</td>
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<tr>
<td>IND 216</td>
<td>Plant Layout and Materials Handling</td>
<td>3</td>
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<tr>
<td>IND 245</td>
<td>Time and Motion Study</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved IND Elective</td>
<td>3</td>
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</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Consult with the program head or counselor. Courses must be approved by the appropriate academic dean.

3 ITE 115 satisfies the college’s computer competency requirements for graduation.

4 Students may select any of the following courses to meet this requirement: DIT 121, 125, HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

INDUSTRIAL SUPERVISION

The Industrial Supervision program is designed to provide the practical knowledge, skills, and training for those seeking to work as industrial supervisory technicians, materials-handling supervisors, production line supervisors, or plant operations technical supervisors.

ASSOCIATE OF APPLIED SCIENCE DEGREE: INDUSTRIAL TECHNOLOGY

Specialization: Industrial Supervision (Plan Code: 963.04)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
</tr>
<tr>
<td>IND 121</td>
<td>Industrial Supervision I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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<td>Approved IND Elective</td>
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Semester 2

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<tr>
<td>IND 106</td>
<td>Industrial Engineering Technology</td>
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<tr>
<td>IND 115</td>
<td>Materials and Processes of Industry</td>
<td>4</td>
</tr>
<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
</tr>
<tr>
<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
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</tr>
<tr>
<td></td>
<td>Approved IND Elective</td>
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Semester 3

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<th>Course No.</th>
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<tr>
<td>IND 122</td>
<td>Industrial Supervision II</td>
<td>3</td>
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<tr>
<td>IND 145</td>
<td>Introduction to Metrology</td>
<td>3</td>
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<tr>
<td>IND 146</td>
<td>Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>MTH 164</td>
<td>Precalculus II</td>
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<tbody>
<tr>
<td>IND 150</td>
<td>Industrial Management</td>
<td>3</td>
</tr>
<tr>
<td>IND 216</td>
<td>Plant Layout and Materials Handling</td>
<td>3</td>
</tr>
<tr>
<td>IND 245</td>
<td>Time and Motion Study</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Health/Physical Education Elective&lt;sup&gt;4&lt;/sup&gt;</td>
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<td>Humanities Elective&lt;sup&gt;3&lt;/sup&gt;</td>
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<td>Total Minimum Credits</td>
<td></td>
<td>65</td>
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</table>

### CAREER STUDIES: INDUSTRIAL SUPERVISION

(Plan Code: 221.991.07)

The Career Studies Certificate in Industrial Supervision is designed to provide those with previous work experience the practical knowledge, skills, and training for those seeking work as an industrial supervisory technician, production planning supervisor, materials-handling supervisor, production line supervisor, or plant operations technical supervisor.

Students enrolled in this curriculum are not eligible for federal financial assistance.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
</tr>
<tr>
<td>IND 121</td>
<td>Industrial Supervision I</td>
<td>3</td>
</tr>
<tr>
<td>IND 216</td>
<td>Plant Layout and Materials Handling</td>
<td>3</td>
</tr>
<tr>
<td>IND 245</td>
<td>Time and Motion Study</td>
<td>3</td>
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<tr>
<td>Semester Total</td>
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</tr>
</tbody>
</table>

<sup>1</sup> Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s)

<sup>2</sup> Consult with the program head or counselor. Courses must be approved by the appropriate academic dean.

<sup>3</sup> ITE 115 satisfies the college's computer competency requirements for graduation.

<sup>4</sup> Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

### OCCUPATIONAL SAFETY

The Occupational Safety program is designed to provide occupational safety instruction, information, and knowledge of safety compliance in accordance with current OSHA regulations and inspection procedures.

The Industrial Technology degree Specialization in Occupational Safety is designed for any of a number of managerial/supervisory positions in safety including OSHA compliance, safety investigation and inspection, or environmental protection.

### ASSOCIATE OF APPLIED SCIENCE DEGREE: INDUSTRIAL TECHNOLOGY

Specialization: Occupational Safety (Plan Code: 963.12)

#### Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts&lt;sup&gt;3&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
<td>3</td>
</tr>
<tr>
<td>SAF 126</td>
<td>Principles of Industrial Safety</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Approved IND/SAF Elective&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3</td>
</tr>
<tr>
<td>Semester Total</td>
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#### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
</tr>
<tr>
<td>SAF 135</td>
<td>Safety Program Organization and Administration</td>
<td>3</td>
</tr>
<tr>
<td>SAF 205</td>
<td>Human Factors and Safety Psychology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved IND/SAF Elective&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3</td>
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<tr>
<td></td>
<td>Health/Physical Education Elective&lt;sup&gt;4&lt;/sup&gt;</td>
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<tr>
<td></td>
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#### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
</tr>
<tr>
<td>IND 145</td>
<td>Introduction to Metrology</td>
<td>3</td>
</tr>
<tr>
<td>IND 146</td>
<td>Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>MTH 164</td>
<td>Precalculus II</td>
<td>3</td>
</tr>
<tr>
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<td>Social Science Elective&lt;sup&gt;1&lt;/sup&gt;</td>
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#### Semester 4

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>IND 115</td>
<td>Materials and Processes of Industry</td>
<td>4</td>
</tr>
<tr>
<td>IND 150</td>
<td>Industrial Management</td>
<td>3</td>
</tr>
<tr>
<td>IND 245</td>
<td>Time and Motion Study</td>
<td>3</td>
</tr>
<tr>
<td>SAF 246</td>
<td>Hazardous Chemicals, Materials, and Waste in the Workplace</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities Elective&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3</td>
</tr>
<tr>
<td>Semester Total</td>
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<td>16</td>
</tr>
<tr>
<td>Total Minimum Credits</td>
<td></td>
<td>65</td>
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</tbody>
</table>
CAREER STUDIES: OCCUPATIONAL SAFETY
(Plan Code: 221.991.50)

The Career Studies Certificate in Occupational Safety program prepares students with previous work experience to become a safety technician, a safety examiner for an insurance company, a consumer safety inspector, an industrial hygienist, an OSHA compliance/enforcement officer, a production specialist, or a fire marshal.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
</tr>
<tr>
<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
<td>3</td>
</tr>
<tr>
<td>SAF 126</td>
<td>Principles of Industrial Safety</td>
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<td>Safety Program Organization and Administration</td>
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</tr>
<tr>
<td>SAF 205</td>
<td>Human Factors and Safety Psychology</td>
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<td>3</td>
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1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. Consult with the program head or counselor. Courses must be approved by the appropriate academic dean.

3. ITE 115 satisfies the college’s computer competency requirements for graduation.

4. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

QUALITY ASSURANCE

The Quality Assurance program provides certification through the American Society for Quality (ASQ) and is designed to produce graduates who can manage, plan, design, and maintain effective quality control programs for a variety of industries.

The Quality Assurance program prepares technicians to handle quality assurance issues and monitoring for industry and/or manufacturing company production operations.

Graduates are prepared for promotion to supervisory technical positions and find jobs in: quality engineering, quality assurance, production, operations, material management, and other industrial marine engineering functions.

ASSOCIATE OF APPLIED SCIENCE DEGREE: INDUSTRIAL TECHNOLOGY

Specialization: Quality Assurance (Plan Code: 963.05)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
</tr>
<tr>
<td>IND 106</td>
<td>Industrial Engineering Technology</td>
<td>3</td>
</tr>
<tr>
<td>IND 237</td>
<td>Fundamentals of ISO 9000</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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Semester 2

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<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>IND 115</td>
<td>Materials and Processes of Industry</td>
<td>4</td>
</tr>
<tr>
<td>IND 145</td>
<td>Introduction to Metrology</td>
<td>3</td>
</tr>
<tr>
<td>IND 146</td>
<td>Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>MTH 163</td>
<td>Precalculus I</td>
<td>3</td>
</tr>
<tr>
<td>SAF 120</td>
<td>Safety and Health Standards: Regulations and Codes</td>
<td>3</td>
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Semester 3

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<tbody>
<tr>
<td>IND 102</td>
<td>Quality Assurance Technology II</td>
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</tr>
<tr>
<td>IND 105</td>
<td>Nondestructive Inspection (NDI) and Testing</td>
<td>3</td>
</tr>
<tr>
<td>IND 236</td>
<td>Total Quality Concepts</td>
<td>3</td>
</tr>
<tr>
<td>MTH 164</td>
<td>Precalculus II</td>
<td>3</td>
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<td>Social Science Elective</td>
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Semester 4

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<td>Industrial Management</td>
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<td>Approved IND Elective</td>
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<td>3</td>
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<tr>
<td>Humanities Elective</td>
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<td>3</td>
</tr>
<tr>
<td>Health/Physical Education Elective</td>
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<td>2</td>
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<tr>
<td>Social Science Elective</td>
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<td><strong>Semester Total</strong></td>
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<td><strong>17</strong></td>
</tr>
<tr>
<td><strong>Total Minimum Credits</strong></td>
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<td><strong>65</strong></td>
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</table>

CAREER STUDIES: QUALITY ASSURANCE
(Plan Code: 221.991.51)

The Career Studies Certificate in Quality Assurance provides the content for those seeking to work in the field of quality assurance.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
</tr>
<tr>
<td>IND 102</td>
<td>Quality Assurance Technology II</td>
<td>3</td>
</tr>
<tr>
<td>IND 146</td>
<td>Statistical Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>IND 236</td>
<td>Total Quality Concepts</td>
<td>3</td>
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INFORMATION SYSTEMS TECHNOLOGY

PURPOSE
The Information Systems Technology (IST) programs at TCC have three purposes: 1) to prepare students for employment in the computer and information technology field, 2) to provide computer-related skill development that supports career advancement in other fields, and 3) to offer advanced skill training for individuals already employed in the information technology field.

IST programs prepare students for employment as programmers, computer support specialists, network administrators, database specialists, and a variety of other technician-level positions in areas such as network security, web design, geographic information systems, virtualization, cloud computing, geospatial intelligence, and server infrastructure administration. Students interested in employment in the information systems field should complete the Associate of Applied Science degree. This degree program will provide students with a comprehensive set of skills that employers seek in new hires. Completion of one or more Career Studies Certificate programs by students with a previous college degree can be valuable for those seeking a career change.

PROGRAMS
The IST programs at TCC are offered as Career Studies Certificates, a Certificate, and an Associate degree.

• Each Career Studies Certificate consists of technology courses that focus on a specific career area in information technology:
  • Cloud Computing
  • Cyber Security
  • Database Specialist
  • Geographic Information Systems

• Geospatial Intelligence
• Network Administration
• Network Infrastructure Specialist
• Programmer Trainee
• Server Infrastructure Administrator – Windows 2012
• Virtualization
• Web Development Specialist

(Most of the above focus areas prepare students to sit for either vendor-specific or vendor-neutral certifications.)

• The Certificate program includes core information technology courses, general education courses, and information technology electives.

• The Associate degree program builds on coursework completed in a Certificate program and includes additional general education, computer, and business courses.

ADMISSION
For entry into any of the college’s IST Career Studies Certificate programs, students are encouraged to complete the IT core requirements of ITN 101, ITN 106, ITN 107, and ITP 100 (or CSC 110). Some Career Studies Certificate programs alter these requirements slightly. Be sure to check the specific program requirements prior to enrolling in the core classes.

ADDITIONAL INFORMATION
The field of information technology is constantly evolving, and TCC frequently changes its courses and programs to keep them current. Please visit the following website for the most up-to-date information: www.tcc.edu/IST.

Students enrolled in many of the IST courses are eligible for free software from Microsoft Corporation as a result of TCC’s membership in the Microsoft Developers’ Network Academic Alliance (MSDNAA). See www.tcc.edu/IST for details about MSDNAA.

Associate of Applied Science Degree:
• Information Systems Technology

Certificate:
• Information Systems Technology

Career Studies Certificates:
• Cloud Computing
• Cyber Security
• Database Specialist
• Geographic Information Systems
• Geospatial Intelligence
• Network Administration
• Network Infrastructure Specialist
• Programmer Trainee
• Server Infrastructure Administrator – Windows 2012
• Virtualization
• Web Development Specialist
ASSOCIATE OF APPLIED SCIENCE DEGREE: INFORMATION SYSTEMS TECHNOLOGY
(Plan Code: 299)

The Associate of Applied Science (A.A.S.) degree program enables students to concentrate in one of the following areas: Cloud Computing, Cyber Security, Database Specialist, Geographic Information Systems, Geospatial Intelligence, Network Administration, Network Infrastructure Specialist, Programmer Trainee, Server Infrastructure Administrator - Windows 2012, Virtualization, or Web Development Specialist. Students select from ONE of the IST Career Studies Certificate programs to define an area of concentration.

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts¹</td>
<td>4</td>
</tr>
<tr>
<td>ITN 106</td>
<td>Microcomputer Operating Systems²</td>
<td>4</td>
</tr>
<tr>
<td>ITN 107</td>
<td>Personal Computer Hardware and Troubleshooting</td>
<td>4</td>
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<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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Semester 2

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<tbody>
<tr>
<td>BUS 100</td>
<td>Introduction to Business</td>
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<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
</tr>
<tr>
<td>ITN 101</td>
<td>Introduction to Network Concepts³</td>
<td>4</td>
</tr>
<tr>
<td>ITP 100</td>
<td>Software Design</td>
<td>4</td>
</tr>
<tr>
<td>MTH 158</td>
<td>College Algebra (or higher)</td>
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Semester 3

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>AST 205</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>BUS 125</td>
<td>Applied Business Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>IT Approved Elective⁵</td>
<td></td>
<td>4</td>
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<tr>
<td>IT Approved Elective⁵</td>
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</table>

Semester 4

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<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>ACC 212</td>
<td>Principles of Accounting II (or IT Approved Elective⁶)</td>
<td>3</td>
</tr>
<tr>
<td>ECO 120</td>
<td>Survey of Economics (or ECO 201 or ECO 202)</td>
<td></td>
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<tr>
<td></td>
<td>Humanities Elective³</td>
<td>3</td>
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<td></td>
<td>IT Approved Elective⁶</td>
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</tbody>
</table>

IT Approved Elective⁵

Semester Total 16

Total Minimum Credits 66

¹ ITE 115 satisfies the college’s computer competency requirements for graduation.
² Students in the Database Specialist curriculum should take ITN 171 UNIX I in place of ITN 106.
³ Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).
⁴ Students in the Web Development Specialist curriculum should take ITE 130 Introduction to Internet Services in place of ITN 101.
⁵ IT approved electives must be selected from ONE of the IST Career Studies Certificate programs.

CERTIFICATE: INFORMATION SYSTEMS TECHNOLOGY
(Plan Code: 200)

The Certificate program enables students to complete the core requirements for information technology and start their concentration in one of the following areas: Cloud Computing, Cyber Security, Database Specialist, Geographic Information Systems, Geospatial Intelligence, Network Administration, Server Infrastructure Administrator – Windows 2012, Network Infrastructure Specialist, Programmer Trainee, Virtualization, or Web Development Specialist. Students select from ONE of the IST Career Studies Certificate programs to define an area of concentration.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts¹</td>
<td>4</td>
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<tr>
<td>ITN 106</td>
<td>Microcomputer Operating Systems²</td>
<td>4</td>
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<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ITN 101</td>
<td>Introduction to Network Concepts³</td>
<td>4</td>
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<tr>
<td>ITN 107</td>
<td>Personal Computer Hardware and Troubleshooting</td>
<td>4</td>
</tr>
<tr>
<td>ITP 100</td>
<td>Software Design</td>
<td>4</td>
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<tr>
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</table>
Semester 3
Course No.  Course Title                  Credits
MTH 158  College Algebra (or higher)     3
IT Approved Elective4                   4
IT Approved Elective4                   3
Semester Total                          10
Total Minimum Credits                   34

1  ITE 115 satisfies the college’s computer competency requirements for graduation.
2  Students in the Database Specialist curriculum should take ITN 171 UNIX I in place of ITN 106.
3  Students in the Web Development Specialist curriculum should take ITE 130 Introduction to Internet Services in place of ITN 101.
4  IT approved electives must be selected from ONE of the IST Career Studies Certificate programs.

CAREER STUDIES: CLOUD COMPUTING  (Plan Code: 221.299.50)
The Cloud Computing Career Studies Certificate program prepares students to install, deploy, configure, manage, secure, and analyze cloud computing technologies. A graduate may be employed in positions such as storage manager, storage administrator, storage architect, business continuity administrator, business recovery administrator, cloud architect, cloud administrator, server administrator, server systems administrator, monitoring operator, network administrator, or systems analyst.

This advanced Career Studies Certificate program is designed for working professionals with substantial networking experience. Before entering the program, students must successfully complete ITN 101 (Introduction to Network Concepts). TCC is a member of the EMC Academic Alliance (EMCAA) and an authorized VMware Academic partner, which entitles students to sit for industry certification exams.

Semester 1
Course No.  Course Title                  Credits
ITN 171  UNIX I                          4
ITN 260  Network Security Basics         4
Semester Total                          8

Semester 2
Course No.  Course Title                  Credits
ITN 213  Information Storage and Management1 4
ITN 257  Cloud Computing:                 4
          Infrastructure and Services1       4
Semester Total                          8

Semester 3
Course No.  Course Title                  Credits
ITN 258  Cloud Computing:                 4
          Backup and Recovery1               4
ITN 254  Virtual Infrastructure:         3-4
          Installation and Configuration2   3-4
          (or ITN 290 or ITN 2973)           3-4
Semester Total                          7-8
Total Minimum Credits                   23-24

1  Prepares students to sit for the EMC Proven Professional Associate certification exam.
2  Prepares students to sit for the VMware Certified Professional certification exam.
3  Students seeking Industry certification should enroll in ITN 254.

CAREER STUDIES: CYBER SECURITY  (Plan Code: 221.732.09)
The Cyber Security Career Studies Certificate program is designed to provide students with the skills to recognize and prevent threats to information and information systems and to master techniques for defense against such threats. Security models, intrusion detection, incident handling, firewalls, perimeter protection, and network security law issues are covered in the course work. Graduates may seek employment as information security officers and network security specialists in local businesses, educational institutions, and governmental agencies.

This advanced Career Studies Certificate program is designed for working professionals with significant networking experience. ITN 260 prepares students for the CompTIA Security+ certification examination. Depending upon the selection of courses, students are prepared for Cisco, GIAC, Microsoft, and other CompTIA industry certification examinations.

Semester 1
Course No.  Course Title                  Credits
ITN 260  Network Security Basics         4
ITN 267  Legal Topics in Network Security 3
Semester Total                          7

Semester 2
Course No.  Course Title                  Credits
ITN 261  Network Attacks, Computer Crime and Hacking 4
ITN 262  Network Communication, Security and Authentication 4
ITN 263  Internet/Intranet Firewalls and E-Commerce Security 4
Semester Total                          12

Semester 3
Course No.  Course Title                  Credits
ITN 266  Network Security Layers          4
ITN Approved Elective1                   3-4
Semester Total                          7-8
Total Minimum Credits                   26-27
ITN Approved Electives (Before selecting an elective, be sure that you have successfully completed the prerequisite course or courses.):

ITN 111 – Server Administration (Windows 2012)
ITN 154 – Network Fundamentals, Router Basics, and Configuration (ICND1) – Cisco
ITN 155 – Switching, Wireless, and WAN Technologies (ICND2) – Cisco
ITN 254 – Virtual Infrastructure: Installation and Configuration
ITN 275 – Incident Response and Computer Forensics
ITN 290 or ITN 297– Coordinated Internship in ITN or Cooperative Education in ITN

CAREER STUDIES: DATABASE SPECIALIST (Plan Code: 221.299.11)

The Database Specialist Career Studies Certificate program provides students with skills in designing, implementing, maintaining, and troubleshooting relational databases. Graduates may seek employment as database administrators, database analysts, or database specialists.

TCC is an Oracle Academic Initiative (OAI) Partner and an authorized Oracle training site. The courses in this program prepare students for the examinations leading to Oracle Certified Associate (OCA) and Oracle Certified Professional (OCP) industry certifications.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ITD 132</td>
<td>Structured Query Language</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ITD 260</td>
<td>Data Modeling and Design</td>
<td>4</td>
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Semester Total 8

<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ITD 250</td>
<td>Database Architecture and Administration</td>
<td>4</td>
<td></td>
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<tr>
<td>ITD 134</td>
<td>PL/SQL Programming</td>
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Semester Total 8

<table>
<thead>
<tr>
<th>Semester 3</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
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Semester Total 8

<table>
<thead>
<tr>
<th>Semester 4</th>
<th>Course No.</th>
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<tbody>
<tr>
<td>Approved Electives</td>
<td>3-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Semester Total 3-4

Total Minimum Credits 27-28

1.
Electives may be chosen from any of the courses listed below:
ITD 136 – Database Management Software
ITD 152 – Oracle Forms Developer
ITD 251 – Database System Development
ITD 252 – Database Backup and Recovery
ITD 258 – Database Performance and Tuning

CAREER STUDIES: GEOGRAPHIC INFORMATION SYSTEMS (GIS) (Plan Code: 221.719.71)

The Geographic Information Systems (GIS) Career Studies Certificate program provides students with skills to visualize, analyze, and model systems to help in the planning and decision-making processes of a business organization, thereby making geographical information accessible to scientists, planners, decision makers, and the public. Graduates may seek employment as GIS specialists within a private, public, or governmental agency.

This advanced Career Studies Certificate program requires a strong background in microcomputer applications, including word processing, spreadsheets, databases, operating systems, Internet maneuverability, and email. Students can obtain proficiency in these areas by completing ITE 115.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>GIS 101</td>
<td>Introduction to Geospatial Technology I</td>
<td>3</td>
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<tr>
<td>GIS 200</td>
<td>Geographical Information Systems I</td>
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Semester Total 7

<table>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>GIS 201</td>
<td>Geographical Information Systems II</td>
<td>4</td>
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<tr>
<td>GIS 203</td>
<td>Cartography for GIS</td>
<td>4</td>
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Semester Total 11-12

<table>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>GIS 255</td>
<td>Exploring our Earth: Introduction to Remote Sensing</td>
<td>4</td>
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<tr>
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<td>3-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Semester Total 7-8

Total Minimum Credits 25-27

1.
GIS Approved Electives:
CIV 256 – Global Positioning Systems for Land Surveying (3 cr)
GIS 205 – GIS 3-Dimensional Analysis (4 cr)
GIS 210 – Understanding Geographic Data (4 cr)
GIS 215 – New GIS Software Platforms and Applications (4 cr)
GIS 220 – Introduction to Urban and Regional Planning (4 cr)
GIS 290 or GIS 297 – Coordinated Internship or Cooperative Education (3-4 cr)
GOL 105 – Physical Geology (4 cr)
**CAREER STUDIES: GEOSPATIAL INTELLIGENCE (GEOINT)**  
(Plan Code: 221.719.72)

The Geospatial Intelligence (GEOINT) Career Studies Certificate program provides students with skills to work as analysts in the geospatial field of intelligence in positions such as cartographic analyst, geospatial intelligence analyst, marine analyst, nautical cartographic analyst, program management execution officer, system engineer, geodetic surveyor, geospatial data steward, imagery intelligence analyst, orbit analyst, regional source analyst, research analyst, and source strategist.

This advanced Career Studies Certificate program requires a strong background in microcomputer applications, including word processing, spreadsheets, databases, operating systems, Internet maneuverability, and email. Students can obtain proficiency in these areas by completing ITE 115.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GIS 101</td>
<td>Introduction to Geospatial Technology I</td>
<td>3</td>
</tr>
<tr>
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<td>GIS 200</td>
<td>Geographical Information Systems I</td>
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<table>
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<tbody>
<tr>
<td></td>
<td>GIS 201</td>
<td>Geographical Information Systems II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>GIS 255</td>
<td>Exploring Our Earth: Introduction to Remote Sensing</td>
<td>4</td>
</tr>
<tr>
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<table>
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<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td></td>
<td>GIS 205</td>
<td>GIS 3-Dimensional Analysis</td>
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<td>3-4</td>
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<tbody>
<tr>
<td></td>
<td>GIS 298</td>
<td>Seminar and Project in Geospatial Intelligence</td>
<td>3</td>
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<tr>
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<tr>
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</table>

**CAREER STUDIES: NETWORK ADMINISTRATION**  
(Plan Code: 221.732.03)

The Network Administration Career Studies Certificate program provides students with a broad background in network administration utilizing a number of network operating systems, such as Windows, Unix, and Linux. In addition, students configure and maintain routers to support the network infrastructure. Graduates may seek employment as network administrators or help desk technicians.

Depending upon the selection of courses, students are prepared for Cisco, Microsoft, and CompTIA industry certification examinations.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>ITN 110</td>
<td>Client Operating System (Windows 7)</td>
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<tr>
<td></td>
<td>ITN 171</td>
<td>UNIX I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>ITN 154</td>
<td>Network Fundamentals, Router Basics, and Configuration (ICND1) - Cisco</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>ITN 260</td>
<td>Network Security Basics</td>
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<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td>ITN 111</td>
<td>Server Administration (Windows 2012)</td>
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<td>ITN 170</td>
<td>Linux System Administration</td>
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<tr>
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</tbody>
</table>

**CAREER STUDIES: NETWORK INFRASTRUCTURE SPECIALIST**  
(Plan Code: 221.732.07)

The Network Infrastructure Specialist Career Studies Certificate program is designed to provide students with the skills to install and configure a network, optimize Wide Area Networks (WANs) through Internet access solutions that reduce bandwidth and lower costs, configure routers and switches, design and implement wireless solutions, and secure the networks. Graduates may seek employment as network infrastructure administrators, specialists, analysts, or engineers.

The courses in this program prepare students for the examinations leading to industry certifications as a Cisco Certified Networking Associate (CCNA) and as a Cisco Certified Networking Professional (CCNP).
### CAREER AND TECHNICAL EDUCATION

#### Tidewater Community College 2015-16 Catalog

**Semester 1**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITN 154</td>
<td>Network Fundamentals, Router Basics, and Configuration (ICND1) – Cisco&lt;sup&gt;1&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td>ITN 171</td>
<td>UNIX I</td>
<td>4</td>
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**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ITN 155</td>
<td>Switching, Wireless, and WAN Technologies (ICND2) – Cisco&lt;sup&gt;1&lt;/sup&gt;</td>
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**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITN 246</td>
<td>IP Routing (ROUTE) – Cisco&lt;sup&gt;2&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td>ITN 247</td>
<td>IP Switched Networks (SWITCH) – Cisco&lt;sup&gt;2&lt;/sup&gt;</td>
<td>4</td>
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**Semester 4**

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<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ITN 248</td>
<td>IP Network Troubleshooting and Maintenance (TSHOOT) – Cisco&lt;sup&gt;2&lt;/sup&gt;(or ITN 290 or ITN 297&lt;sup&gt;3&lt;/sup&gt;)</td>
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</tr>
<tr>
<td><strong>Semester Total</strong></td>
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</tr>
<tr>
<td><strong>Total Minimum Credits</strong></td>
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</tbody>
</table>

1. Prepares students to sit for the Cisco Certified Networking Associate (CCNA) certification exam.
2. Prepares students to sit for the Cisco Certified Networking Professional (CCNP) certification exam.
3. Students seeking industry certification should enroll in ITN 248.

---

**CAREER STUDIES: PROGRAMMER TRAINEE** (Plan Code: 221.299.06)

The Programmer Trainee Career Studies Certificate program provides students with the skills to apply critical-thinking and problem-solving techniques utilizing structured and object-oriented programming languages. Students design, code, debug, and document their programs in addition to developing web-based application programs. Graduates may be employed as entry-level programmers or applications support personnel. Languages currently supported include: Java, Visual Basic.NET, C++, C#.NET, PL/SQL, and ASP.NET.

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**Semester 1**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITD 132</td>
<td>Structured Query Language</td>
<td>4</td>
</tr>
<tr>
<td>ITP</td>
<td>Introductory Programming Language&lt;sup&gt;1&lt;/sup&gt;</td>
<td>4</td>
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<tr>
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**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITE 215</td>
<td>Advanced Computer Applications and Integration</td>
<td>4</td>
</tr>
<tr>
<td>ITP</td>
<td>Advanced Programming Language&lt;sup&gt;2&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ITP 251</td>
<td>Systems Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>ITP</td>
<td>Advanced Programming Language&lt;sup&gt;2&lt;/sup&gt;</td>
<td>4</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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</tr>
<tr>
<td><strong>Total Minimum Credits</strong></td>
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<td><strong>27</strong></td>
</tr>
</tbody>
</table>

1. Choose from ITP 112, ITP 120, ITP 132, or ITP 136.
2. Choose from ITP 212, ITP 220, ITP 232, or ITP 236.

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**CAREER STUDIES: SERVER INFRASTRUCTURE ADMINISTRATOR – WINDOWS 2012** (Plan Code: 221.732.32)

The Server Infrastructure Administrator – Windows 2012 Career Studies Certificate program is designed to provide students with the skills to plan, design, configure, administer, maintain, analyze, and troubleshoot a local area network and an enterprise-level network using the Windows Server 2012 operating system. Graduates may seek employment as server administrators, server systems administrators, monitoring operators, local area network administrators, enterprise systems administrators, IT system administrators, enterprise security administrators, computer support specialists, information security analysts, or systems architects.

The courses in this program assist students in their pursuit of the following Microsoft certifications:

- Microsoft Certified Solutions Associate (MCSA) – Windows Server 2012 by successfully completing ITN 111, ITN 112, and ITN 113.
Semester 1
Course No. Course Title Credits
ITN 110 Client Operating System (Windows 7) 4
ITN 111 Server Administration (Windows 2012) 4
Semester Total 8

Semester 2
Course No. Course Title Credits
ITN 112 Network Infrastructure (Windows 2012) 4
ITN 113 Active Directory (Windows 2012) 4
Semester Total 8

Semester 3
Course No. Course Title Credits
ITN 218 Server Infrastructure Design and Implementation (Windows 2012) 4
ITN 219 Design and Implementation (Windows 2012) (or ITN 290 or ITN 297) 3-4
Semester Total 7-8
Total Minimum Credits 23-24

1 Students seeking industry certification should enroll in ITN 219.

CAREER STUDIES: VIRTUALIZATION (Plan Code: 221.299.71)

The Virtualization Career Studies Certificate program prepares students to install, deploy, configure, manage, secure, and analyze a VMware virtual infrastructure in a networked environment. Graduates may seek employment as server administrators, monitoring operators, local area network administrators, enterprise systems administrators, IT systems administrators, or systems architects, along with a growing field of VMware specialists. Those who complete the program may also wish to pursue industry certifications, such as VMware Certified Professional (VCP) or EMC Proven Professional Associate.

Semester 1
Course No. Course Title Credits
ITN 171 UNIX I 4
ITN 260 Network Security Basics 4
Semester Total 8

Semester 2
Course No. Course Title Credits
ITN 213 Information Storage and Management 4
ITN 254 Virtual Infrastructure: Installation and Configuration 4
Semester Total 8

Semester 3
Course No. Course Title Credits
ITN Approved Elective1 3-4
Semester Total 3-4
Total Minimum Credits 19-20

1 ITN Approved Electives (Before selecting an elective, be sure that you have successfully completed the prerequisite course or courses.)
ITN 255 - Virtual Infrastructure: Deployment, Security and Analysis
ITN 231 - Desktop Virtualization
ITN 290 or ITN 297 - Coordinated Internship in ITN or Cooperative Education in ITN

CAREER STUDIES: WEB DEVELOPMENT SPECIALIST (Plan Code: 221.352.01)

The Web Development Specialist Career Studies Certificate program is designed to provide students with the skills to design, administer, and troubleshoot web pages and websites. Depending upon the selection of electives within the program, students can concentrate on web design or web programming. Graduates may seek employment as web page designers and managers, website managers, web graphics designers, web application developers, web programmers, or web database programmers.

The courses in this program prepare students for the examinations leading to industry certifications as a Certified Internet Webmaster (CIW) Associate and as a Certified Internet Webmaster (CIW) Professional.

Semester 1
Course No. Course Title Credits
ITN 109 Internet and Network Foundations1 4
IT Approved Elective2 4
Semester Total 8

Semester 2
Course No. Course Title Credits
ITD 110 Web Page Design I1 4
ITN 224 Web Server Management 4
Semester Total 8

Semester 3
Course No. Course Title Credits
ITD 210 Web Page Design II1 4
IT Approved Elective2 4
(or ITD 290 or ITD 297) 3-4
Semester Total 7-8
Total Minimum Credits 23-24

1 Prepares students to sit for the Certified Internet Webmaster (CIW) Foundations Associate and Web Design Specialist certification exams.
Select from courses for career specialties in either Web Design Graphics or Web Programming (Before selecting an elective, be sure that you have successfully completed the prerequisite course or courses):

Web Design Graphics:
- ITD 112 – Designing Web Page Graphics
- ITD 212 – Interactive Web Design

Web Programming:
- ITD 132 – Structured Query Language
- ITP 120 – Java Programming I
- ITP 140 – Client Side Scripting
- ITP 240 – Server Side Programming
- ITP 242 – ASP Server Side Scripting

Students seeking industry certification should enroll in one of the electives listed in Note 2.

INTERIOR DESIGN

Associate of Applied Science Degree:
- Interior Design

Career Studies Certificates:
- Associate Designer
- Green Design for Interiors
- Kitchen and Bath Design

The Interior Design program provides a foundation in both commercial and residential spaces, allowing students to develop skills in visual presentation, spatial and lighting design, color coordination, material selection, estimating, and contract planning. Students work with state-of-the-art technology that incorporates interior design with the latest versions of computer-aided design (CAD) software. Graduates may seek positions in visual merchandising, floor coverings, decorative accessories, and home furnishings. They work for architectural firms, commercial designers, retailers, or open their own design firms.

ASSOCIATE OF APPLIED SCIENCE DEGREE: INTERIOR DESIGN (Plan Code: 520)

Semester 1 (Based on a Fall Semester start)

Course No.            Course Title                      Credits
IDS 100              Theory and Techniques of Interior Design 3
IDS 105              Architectural Drafting for Interior Design 3
IDS 205              Materials and Sources                  3
MTH 158              College Algebra (or MTH 121)            3
SDV 101              Orientation to Interior Design          1
                       Social Science Elective¹                        3
                       Semester Total                                     16

Semester 2

Course No.            Course Title                      Credits
ENG 111              College Composition I                    3
IDS 106              Three-Dimensional Drawing and Rendering  3
IDS 109              Styles of Furniture and Interiors            3
IDS 206              Lighting and Furnishings                    3
                       Humanities or Social Science Elective¹              3
                       Semester Total                                     15

Semester 3

Course No.            Course Title                      Credits
IDS 120              Estimation for Interior Coverings         3
                       Humanities Elective¹                                3
                       IDS Approved Elective²                               3
                       Semester Total                                     9

Semester 4

Course No.            Course Title                      Credits
IDS 116              Period Residential Design                  4
IDS 215              Theory and Research in Commercial Design  3
                       Computer-Aided Drafting Software Requirement
                       (IDS 245, 246 or 247)                                 3
                       IDS Approved Elective²                               3
                       Semester Total                                     13

Semester 5

Course No.            Course Title                      Credits
IDS 222              Designing Commercial Interiors II          4
IDS 225              Business Procedures                          3
IDS 285              Portfolio and Resume Preparation for Interior Designers
                       IDS Approved Elective²                               3
                       Semester Total                                     13
                       Total Minimum Credits                                66

¹ Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

² IDS Approved Elective: Any IDS course not already required as part of this AAS degree. This may include an Art or related design course approved by the department representative.

CAREER STUDIES: ASSOCIATE DESIGNER (Plan Code: 221.520.17)

The Associate Designer Career Studies Certificate provides a basic foundation in visual presentation skills, spatial design, color coordination, the evolution of furniture and interior styles, and estimation. All courses count toward the associate degree.

This Career Studies Certificate program prepares the student for employment as a color consultant or sales associate of retail interior design.
### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDS 100</td>
<td>Theory and Techniques of Interior Design</td>
<td>3</td>
</tr>
<tr>
<td>IDS 105</td>
<td>Architectural Drafting for Interior Design</td>
<td>3</td>
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<td>IDS 109</td>
<td>Styles of Furniture and Interiors</td>
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<td>Estimation of Interior Coverings</td>
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<td>IDS 206</td>
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<td>IDS 245</td>
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<td><strong>Total Minimum Credits</strong></td>
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### CAREER STUDIES: GREEN DESIGN FOR INTERIORS  
(Plan Code: 221.520.10)

The Career Studies Certificate in Green Design for Interiors prepares students for a career emphasis in "Green Design." This Career Studies Certificate is based upon the requirements for LEED Certification (Leadership in Energy and Environmental Design), and is designed to prepare individuals to take the LEED Certification exam for Homes (LEED-H). Program graduates will be able to assist their clients through the inclusion of more eco-friendly interior materials and techniques for 'Green Design' interiors.

Students enrolled in this curriculum are not eligible for federal financial assistance.

### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
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<tbody>
<tr>
<td>IDS 100</td>
<td>Theory and Techniques of Interior Design</td>
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<tr>
<td>IDS 105</td>
<td>Architectural Drafting for Interior Design</td>
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<td>IDS 250</td>
<td>Green Design for Interior Designers</td>
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### Semester 2

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<td>IDS 225</td>
<td>Business Procedures</td>
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### CAREER STUDIES: KITCHEN AND BATH DESIGN  
(Plan Code: 221.520.25)

The Career Studies Certificate in Kitchen and Bath Design prepares students for a career emphasis in the design of kitchens, baths, and related cabinetry. This Career Studies Certificate is based on the requirements of the National Kitchen and Bath Association (NKBA), and it prepares individuals to take the NKBA examination for an Associate Kitchen and Bath Designer (AKBD) certification. Graduates of the program are prepared to apply through the NKBA to take the certification exam for the Associate Kitchen and Bath Designer certification (AKBD).

### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
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<tbody>
<tr>
<td>IDS 105</td>
<td>Architectural Drafting for Interior Design</td>
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</tr>
<tr>
<td>IDS 106</td>
<td>Three-Dimensional Drawing and Rendering</td>
<td>3</td>
</tr>
<tr>
<td>IDS 130</td>
<td>Introduction to Kitchen and Bath Design Systems</td>
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### Semester 2

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<td>Lighting and Furnishings</td>
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<tr>
<td>IDS 247</td>
<td>Kitchen and Bath Design Software</td>
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<tr>
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<td>Materials and Sources</td>
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<td>IDS 225</td>
<td>Business Procedures</td>
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### Semester 4

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<tr>
<td>IDS 290</td>
<td>Coordinated Internship in Interior Design</td>
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<tr>
<td>(or IDS 297)</td>
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<td></td>
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<tr>
<td>IDS 298</td>
<td>Seminar and Project in Interior Design</td>
<td>3</td>
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<td><strong>Semester Total</strong></td>
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<td><strong>Total Minimum Credits</strong></td>
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### MACHINE TECHNOLOGY

**Career Studies Certificates:**
- Basic Metal and Plastic Machine Operator
- Computer Numerical Controls (CNC) Operator

### CAREER STUDIES: BASIC METAL AND PLASTIC MACHINE OPERATOR  
(Plan Code: 221.952.70)

The Career Studies Certificate in Basic Metal and Plastic Machine Operator is focused on the operation and entry-level production...
use of Computer Numerical Control (CNC) systems. Following completion of this program, individuals may seek employment as CNC operators.

Upon completion of this program, students are prepared to study for the National Institute for Metalworking Skills (NIMS) industry certification.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CAD 160</td>
<td>Machine Blueprint Reading</td>
<td>3</td>
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<tr>
<td>ELE 233</td>
<td>Programmable Logic Controller Systems I</td>
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<td>MAC 121</td>
<td>Numerical Control I</td>
<td>3</td>
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<tr>
<td>MAC 161</td>
<td>Machine Shop Practices I</td>
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<tr>
<td>MAC 209</td>
<td>Standards, Measurements and Calculations</td>
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<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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CAREER STUDIES: COMPUTER NUMERICAL CONTROLS (CNC) OPERATOR (Plan Code 221.938.02)

The Career Studies Certificate program in Computer Numerical Controls (CNC) Operator prepares students to operate computer numerical controlled machines and the advanced production use of CNC systems. Students are prepared to obtain the National Institute for Metalworking Skills (NIMS) industry certification.

<table>
<thead>
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<th>Semester 1</th>
<th>Course No.</th>
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<tr>
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<td>MAC 121</td>
<td>Numerical Controls I</td>
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<td>MAC 126</td>
<td>Introductory CNC Programming</td>
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<tr>
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<td>MAC 161</td>
<td>Machine Shop Practices I</td>
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<td></td>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
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<td>Numerical Controls II</td>
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<td>MAC 150</td>
<td>Introduction to Computer Aided Manufacturing</td>
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<td>MAC 162</td>
<td>Machine Shop Practices I</td>
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<th>Course Title</th>
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<tr>
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<td>ACC 212</td>
<td>Principles of Accounting II</td>
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<td>BUS 100</td>
<td>Introduction to Business</td>
<td>3</td>
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<tr>
<td></td>
<td>ENG 111</td>
<td>College Composition I</td>
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<td></td>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
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<td></td>
<td>MTH 121</td>
<td>Fundamentals of Mathematics (or higher)</td>
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<td>SDV 100</td>
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<td>BUS 205</td>
<td>Human Resource Management</td>
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<td>BUS 220</td>
<td>Introduction to Business Statistics</td>
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<td>BUS 241</td>
<td>Business Law I</td>
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<td>BUS 265</td>
<td>Ethical Issues in Management</td>
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<td>MKT 100</td>
<td>Principles of Marketing</td>
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<td></td>
<td>BUS 201</td>
<td>Organizational Behavior</td>
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<td>BUS 242</td>
<td>Business Law II</td>
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</tbody>
</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

### CAREER STUDIES: ACQUISITION AND PROCUREMENT
(Plan Code: 221.248.05)

The Career Studies Certificate in Acquisition and Procurement prepares students for employment or advancement in acquisition and procurement positions. Course work covers contract law, pricing, negotiations, and similar processes within this field.

<table>
<thead>
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<th>Course Title</th>
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<tr>
<td></td>
<td>ACQ 121</td>
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<td>Procurement Fundamentals I</td>
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<td>ACQ 215</td>
<td>Contract Law</td>
<td>3</td>
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<td>ACQ 231</td>
<td>Principles of Contract Pricing and Negotiations I</td>
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<td></td>
<td>Procurement Fundamentals II</td>
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<td></td>
<td>ACQ 221</td>
<td>Advanced Acquisition and</td>
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<td></td>
<td>Procurement Management I</td>
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<td></td>
<td>ACQ 232</td>
<td>Principles of Contract Pricing and Negotiations II</td>
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<tr>
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<td><strong>Total Minimum Credits</strong></td>
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### CAREER STUDIES: SMALL BUSINESS MANAGEMENT
(Plan Code: 221.212.24)

The Career Studies Certificate in Small Business Management provides a strong foundation for those interested in launching and/or operating small business ventures. Course work covers theoretical and practical details related to small business accounting, marketing, legal considerations, planning and control, financial management, communications, and supervision.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<td>BUS 111</td>
<td>Principles of Supervision I</td>
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<td>Introduction to Computer Applications and Concepts</td>
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<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>AST 205</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BUS 160</td>
<td>Legal Aspects of Small Business Operations</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>BUS 260</td>
<td>Planning for Small Business</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>FIN 260</td>
<td>Financial Management for Small Business</td>
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<td></td>
<td>MKT 160</td>
<td>Marketing for Small Business</td>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td>BUS 165</td>
<td>Small Business Management</td>
<td>3</td>
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<td><strong>Semester Total</strong></td>
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<tr>
<td></td>
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<td><strong>Total Minimum Credits</strong></td>
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</table>

### CAREER STUDIES: SUPERVISORY MANAGEMENT
(Plan Code: 221.212.25)

The Career Studies Certificate in Supervisory Management offers a comprehensive perspective of human resources, communication, management, organizational behavior, and other aspects of supervision in a variety of fields. Students who already have several years of work experience are prepared for positions such as office manager, supervisor, management trainee, and administrative assistant.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BUS 100</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BUS 201</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
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<table>
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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BUS 200</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BUS 205</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ENG 131</td>
<td>Technical Report Writing I</td>
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<td></td>
<td>SAF 126</td>
<td>Principles of Industrial Safety</td>
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<td><strong>Total Minimum Credits</strong></td>
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</table>
MARITIME LOGISTICS

The Associate of Applied Science (A.A.S.) degree specialization in Management: Maritime Logistics is aimed at those seeking employment or advancing in the area of supply chain management and supervision in maritime organizations. Particular emphasis is placed on the effectiveness and efficiency of planning, implementation, and control of the flow and storage of goods, services, and information from point of origin to point of consumption. In addition to general management course work, this program covers theoretical and practical approaches to supply chain processes, purchasing, inventory and warehouse management, accounting, integrated logistics, and financial management.

Graduates of the maritime logistics program may enter or continue employment in the field of logistics management in maritime or traditional business environments.

ASSOCIATE OF APPLIED SCIENCE DEGREE: MANAGEMENT

Specialization: Maritime Logistics (Plan Code: 212.02)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ACC 211</td>
<td>Principles of Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>BUS 100</td>
<td>Introduction to Business</td>
<td>3</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
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<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I</td>
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<td>(or higher)</td>
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<td>SDV 100</td>
<td>College Success Skills</td>
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Semester 2

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<tbody>
<tr>
<td>ACC 212</td>
<td>Principles of Accounting II</td>
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<tr>
<td>AST 205</td>
<td>Business Communications</td>
<td>3</td>
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<tr>
<td>BUS 125</td>
<td>Applied Business Mathematics</td>
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<tr>
<td>BUS 200</td>
<td>Principles of Management</td>
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<tr>
<td>ECO 120</td>
<td>Survey of Economics (or ECO 201)</td>
<td>3</td>
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<tr>
<td></td>
<td>Health/Physical Education Elective³</td>
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Semester 3

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<th>Course Title</th>
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<tbody>
<tr>
<td>BUS 215</td>
<td>Purchasing and Materials Management</td>
<td>3</td>
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<tr>
<td>(or BUS approved elective²)</td>
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<td></td>
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<tr>
<td>BUS 223</td>
<td>Distribution and Transportation</td>
<td>3</td>
</tr>
<tr>
<td>BUS 265</td>
<td>Ethical Issues in Management</td>
<td>3</td>
</tr>
<tr>
<td>BUS 297</td>
<td>Cooperative Education</td>
<td>3</td>
</tr>
<tr>
<td>(or BUS prefix courses only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MKT 100</td>
<td>Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Humanities Elective³</td>
<td></td>
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<tr>
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Semester 4

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<th>Course No.</th>
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<tbody>
<tr>
<td>BUS 234</td>
<td>Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>BUS 255</td>
<td>Inventory and Warehouse Management</td>
<td>3</td>
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<tr>
<td>(or BUS approved elective²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUS 297</td>
<td>Cooperative Education</td>
<td>3</td>
</tr>
<tr>
<td>(or BUS prefix courses only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIN 215</td>
<td>Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective³</td>
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<td>3</td>
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<td><strong>Semester Total</strong></td>
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<tr>
<td><strong>Total Minimum Credits</strong></td>
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<td><strong>67</strong></td>
</tr>
</tbody>
</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2 Electives:
BUS 130 – Maritime Logistics Afloat
BUS 131 – Maritime Logistics Ashore

3 Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

MARINE GASOLINE ENGINE TECHNOLOGY

Career Studies Certificate:
• Marine Gasoline Engine Technology

The Career Studies Certificate in Marine Gasoline Engine Technology is designed for those planning to maintain, diagnose, and repair marine inboard and outboard engines and stern drive systems found in the commercial and pleasure boating industry.

Students are advised to consult with the program director prior to entering the program.
### MARITIME TECHNOLOGIES

**Associate of Applied Science Degree:**
- Maritime Technologies

**Career Studies Certificates:**
- Marine Electrical
- Marine Mechanical
- Maritime Technologies
- Maritime Welding (see this program listing under the Welding program options)

The Maritime Technologies program is designed to prepare students who are in maritime-related apprenticeship programs to gain the necessary increase in skill level to move into supervisory positions both within their technical fields and within their companies.

Secondarily, this program is designed to prepare novice students for employment in a variety of areas within the maritime industry, to include the following: electrician, electronics technician, inside machinist, outside machinist, pipefitter, rigger, painter, carpenter, insulator, shipfitter, welder and sheetmetal worker. The program provides students with a comprehensive set of maritime industry-related skills that employers seek when selecting technicians for their industry.

Graduates of the Maritime Technologies program who have also completed a registered apprenticeship program will be prepared to apply for supervisory positions within the maritime industry or to pursue a career pathway to a university in a related program. Those graduates who entered the program with no maritime experience will be prepared to apply for positions within the industry.

**ASSOCIATE OF APPLIED SCIENCE DEGREE: MARITIME TECHNOLOGIES**

**Semester 1**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CAD 160</td>
<td>Machine Blueprint Reading (or CAD 140)</td>
<td>3</td>
</tr>
<tr>
<td>ENG 115</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
</tr>
<tr>
<td>MAR 120</td>
<td>Introduction to Ship Systems</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Maritime Careers</td>
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<td>Approved Mathematics Elective</td>
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**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MAR 140</td>
<td>Intro to Hydraulics and Hydraulic Systems</td>
<td>4</td>
</tr>
<tr>
<td>MAR 158</td>
<td>Inboard Engine Service</td>
<td>4</td>
</tr>
<tr>
<td>MAR 159</td>
<td>Large Outboard Engine Service</td>
<td>4</td>
</tr>
<tr>
<td><strong>Semester Total</strong></td>
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**Total Minimum Credits**

- **27 Credits**

**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>IND 101</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
</tr>
<tr>
<td>MAR 297</td>
<td>Cooperative Education</td>
<td>3</td>
</tr>
<tr>
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<td>Approved Elective 3</td>
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<tr>
<td></td>
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<td></td>
<td>Social Science Elective 1</td>
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**Semester 4**

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<th>Course Title</th>
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<tr>
<td>HLT 105</td>
<td>Cardiopulmonary Resuscitation</td>
<td>1</td>
</tr>
<tr>
<td>IND 137</td>
<td>Team Concepts and Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>MAR 297</td>
<td>Cooperative Education</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Elective 3</td>
<td>3</td>
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</tr>
<tr>
<td></td>
<td>Social Science Elective 1</td>
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</tr>
<tr>
<td><strong>Semester Total</strong></td>
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</table>

**Total Minimum Credits**

- **67 Credits**

---

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. Approved Mathematics Elective must be taken from the following: MTH 115, MTH 158, MTH 163.

3. Approved Electives: Choose a course mix of 15 credits from one of the following career areas of interest. All five electives must be chosen from the same career area.

   - Electrical (Electrician, Electronics Technician)
     - ELE 145, ELE 146, ELE 150, ELE 174, ELE 233, MAR 160, MAR 210
   - Mechanical (Inside Machinist, Outside Machinist, Pipefitter, Rigger, Painter, Carpenter, Insulator)
     - ELE 233, IND 115, MAR 130, MEC 154, MEC 155, MEC 268, MEC 269
   - Structural (Shipfitter, Welder, Sheetmetal Worker)
     - IND 115, MAR 130, WEL 165, WEL 170, WEL 171, WEL 210, WEL 220, WEL 230
   - HVAC (HVAC Technician, Junior HVAC Technician)
     - AIR 111, AIR 112, AIR 121, AIR 122, AIR 165, AIR 200, AIR 206
     - CAD 151, CAD 152, CAD 241, CAD 242, CAD 211, CAD 212, CAD 280
     - Industrial Management (Entry-level Construction Supervisor, Entry-level QC, Foreman)
     - ACC 211, BUS 100, BUS 200, BUS 201, BUS 265, IND 121, IND 122, IND 150, IND 236
     - Occupational Safety (Industrial Hygienist)
     - IND 165, IND 216, SAF 120, SAF 205, SAF 246
CAREER STUDIES: MARINE ELECTRICAL (Plan Code: 221.706.10)

The Career Studies Certificate in Marine Electrical is focused on the maintenance and repair of shipboard electrical and electronic systems. Following completion of this program, individuals may seek employment as marine electricians.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 150</td>
<td>A.C. and D.C. Circuit Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>MAR 120</td>
<td>Introduction to Ship Systems</td>
<td>3</td>
</tr>
<tr>
<td>MAR 160</td>
<td>Marine Electrical for Maritime Vessels</td>
<td>3</td>
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Semester 2

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 145</td>
<td>Transformer Connections and Circuits</td>
<td>2</td>
</tr>
<tr>
<td>ELE 146</td>
<td>Electric Motor Control</td>
<td>4</td>
</tr>
<tr>
<td>MAR 210</td>
<td>Marine Electronics for Maritime Vessels</td>
<td>4</td>
</tr>
<tr>
<td>Semester Total</td>
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</tr>
<tr>
<td>Total Minimum Credits</td>
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<td>19</td>
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</tbody>
</table>

CAREER STUDIES: MARINE MECHANICAL (Plan Code: 221.953.20)

The Career Studies Certificate in Marine Mechanical prepares students for a career in the maintenance and repair of shipboard mechanical systems. Following completion of this program, individuals may seek employment as marine mechanical technicians.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD 160</td>
<td>Machine Blueprint Reading</td>
<td>3</td>
</tr>
<tr>
<td>MAR 120</td>
<td>Introduction to Ship Systems</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Maritime Careers</td>
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<td>Approved Elective¹</td>
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Semester 2

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>ENG 115</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>IND 137</td>
<td>Team Concepts and Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>MTH 115</td>
<td>Technical Mathematics I</td>
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<tr>
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<tr>
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<td>25-27</td>
</tr>
</tbody>
</table>

¹ Approved Electives: Students may choose from two of the following courses for their approved electives.

CAREER STUDIES: MARITIME TECHNOLOGIES (Plan Code: 221.953.38)

The Career Studies Certificate in Maritime Technologies prepares students with the core education and skills necessary for entry-level work in the commercial or naval ship repair industry. The students gain familiarization with basic ship construction and ship processes and techniques, various ship systems and the basic knowledge and terminology to report to worksites aboard ships or in the shipyard.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD 160</td>
<td>Machine Blueprint Reading</td>
<td>3</td>
</tr>
<tr>
<td>IND 137</td>
<td>Quality Assurance Technology I</td>
<td>3</td>
</tr>
<tr>
<td>MAR 120</td>
<td>Introduction to Ship Systems</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Maritime Careers</td>
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<tr>
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Semester 2

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<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 115</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>IND 137</td>
<td>Team Concepts and Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>MTH 115</td>
<td>Technical Mathematics I</td>
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<tr>
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<td>25-27</td>
</tr>
</tbody>
</table>

¹ Approved Electives: Students may choose from two of the following courses for their approved electives.

MECHATRONICS

Associate of Applied Science Degree:
• Mechatronics

Career Studies Certificate:
• Mechatronics

The Mechatronics program prepares students for employment in a variety of industries, to include the following: industrial mechanical, electrical, electronic equipment repair, industrial
automation installation, programming, repair; and robotics, electrical and mechanical equipment assembler; mechatronics systems and electromechanical technicians; automated machinery maintenance mechanic; industrial automation and process controls technician. This program also provides students with a comprehensive set of skills that employers seek when selecting technicians for their industry.

ASSOCIATE OF APPLIED SCIENCE DEGREE: MECHATRONICS (Plan Code: 706)

**Semester 1**

<table>
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<tr>
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<th>Course Title</th>
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<tbody>
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<td>MEC 140</td>
<td>Introduction to Mechatronics</td>
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</tr>
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<td>ELE 150</td>
<td>A.C. and D.C. Circuit Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Engineering and Technologies</td>
<td>1</td>
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**Semester 2**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved Elective</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>ELE 211</td>
<td>Electrical Machines I</td>
<td>3</td>
</tr>
<tr>
<td>ELE 146</td>
<td>Electric Motor Control</td>
<td>4</td>
</tr>
<tr>
<td>ETR 281</td>
<td>Digital Systems</td>
<td>3</td>
</tr>
<tr>
<td>INS 230</td>
<td>Instrumentation I</td>
<td>3</td>
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**Semester 3**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 233</td>
<td>Programmable Logic Controller Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ETR 203</td>
<td>Electronic Devices I</td>
<td>3</td>
</tr>
<tr>
<td>MEC 154</td>
<td>Mechanical Maintenance I</td>
<td>3</td>
</tr>
<tr>
<td>MEC 269</td>
<td>Fluid Power-Pneumatic Systems</td>
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**Semester 4**

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<tr>
<th>Course No.</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>MEC 155</td>
<td>Mechanisms</td>
<td>3</td>
</tr>
<tr>
<td>MEC 268</td>
<td>Fluid Power-Hydraulic Systems</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Humanities or Social Science Elective</td>
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<td></td>
</tr>
<tr>
<td>Social Science Elective</td>
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<tr>
<td>Humanities Elective</td>
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<td>66-67</td>
</tr>
</tbody>
</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).
2. Approved Elective:
   ELE 234 - Programmable Logic Controller Systems II (3 cr)
   ELE 246 - Industrial Robotics Programming (3 cr)
   ELE 248 - Microcontroller Interfacing and Programming (3 cr)
   INS 233 - Process Control Integration (4 cr)
3. Approved MTH Electives may be chosen from MTH 103, MTH 115, MTH 163, or other MTH course approved by the appropriate academic dean.

CAREER STUDIES: MECHATRONICS (Plan Code 221.706.90)

The Career Studies Certificate in Mechatronics is aimed at those interested in the maintenance and repair of automation and process control systems. Individuals who complete this certificate may seek employment in machinery design, construction, and repair. They will also be prepared to take industry- and manufacturer-specific certification exams for Mechatronics.

**Semester 1**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 150</td>
<td>A.C. and D.C. Circuit Fundamentals</td>
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<tr>
<td>ETR 281</td>
<td>Digital Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELE 246</td>
<td>Industrial Robotics Programming</td>
<td>3</td>
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**Semester 2**

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 146</td>
<td>Electric Motor Control</td>
<td>4</td>
</tr>
<tr>
<td>INS 230</td>
<td>Instrumentation I</td>
<td>3</td>
</tr>
<tr>
<td>ELE 233</td>
<td>Programmable Logic Controller Systems I</td>
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**Semester 3**

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ELE 234</td>
<td>Programmable Logic Controller Systems II</td>
<td>3</td>
</tr>
<tr>
<td>INS 233</td>
<td>Process Control Integration</td>
<td>4</td>
</tr>
<tr>
<td>Approved Fluid Power Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Total Minimum Credits</td>
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<td>29</td>
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</tbody>
</table>

1. Approved Fluid Power Elective:
   MEC 268 - Fluid Power - Hydraulic Systems
   MEC 269 - Fluid Power - Pneumatic Systems
MEDICAL LABORATORY TECHNOLOGY

**Associate of Applied Science Degree:**

- Medical Laboratory Technology

The Associate of Applied Science degree in Medical Laboratory Technology (MLT) prepares students for employment as medical laboratory technicians upon graduation and certification. Graduates may work under the supervision of a physician or medical technologist (MT) performing routine clinical laboratory tests for the diagnosis, treatment, and prevention of disease.

Admission to the college does not guarantee admission to the MLT program. Applicants to this program must complete BIO 101, BIO 141, and MTH 158 with a “C” or higher for consideration of admission. Students must submit an unofficial transcript along with their health professions application. They must also submit an official copy of their transcripts from other colleges attended to the Central Records Office at Tidewater Community College prior to the program application deadline. For further information regarding admission, continuance and graduation, go to www.tcc.edu (search keywords “medical laboratory technology”).

Upon completion of an accredited program, Medical Laboratory Technicians are eligible to complete a national certification exam administered by the American Society for Clinical Pathology (ASCP) to become certified as a medical laboratory technician.

The Medical Laboratory Technology Program is seeking accreditation by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) 5600 N. River Road, Suite 720, Rosemont, IL 60018 (773) 714-8880. The program has submitted Application for Initial Accreditation, which is the formal application required in the pre-accreditation state. Submission of this document does not assure that the program will be granted Serious Applicant Status nor does it assure that the program will be granted Accreditation.

**ASSOCIATE OF APPLIED SCIENCE DEGREE: MEDICAL LABORATORY TECHNOLOGY (Plan Code: 151)**

### Pre-Admission Semester

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 101</td>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BIO 141</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>MTH 158</td>
<td>College Algebra (MTH 157 preferred)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
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### Semester 1

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHM 111</td>
<td>College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HLT 105</td>
<td>Cardiopulmonary Resuscitation</td>
<td>1</td>
</tr>
<tr>
<td>MDL 101</td>
<td>Introduction to Medical Laboratory Techniques</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>SDV 101 Orientation to Health Care</strong></td>
<td><strong>1</strong></td>
</tr>
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<td></td>
<td><strong>Semester Total</strong></td>
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### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MDL 125</td>
<td>Clinical Hematology I</td>
<td>3</td>
</tr>
<tr>
<td>MDL 210</td>
<td>Immunology and Serology</td>
<td>2</td>
</tr>
<tr>
<td>MDL 251</td>
<td>Clinical Microbiology I</td>
<td>3</td>
</tr>
<tr>
<td>MDL 261</td>
<td>Clinical Chemistry and Instrumentation I</td>
<td>4</td>
</tr>
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<td><strong>Semester Total</strong></td>
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### Semester 3

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MDL 190</td>
<td>Coordinated Phlebotomy Internship</td>
<td>1</td>
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### Semester 4

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MDL 216</td>
<td>Blood Banking</td>
<td>3</td>
</tr>
<tr>
<td>MDL 225</td>
<td>Clinical Hematology II</td>
<td>3</td>
</tr>
<tr>
<td>MDL 252</td>
<td>Clinical Microbiology II</td>
<td>2</td>
</tr>
<tr>
<td>MDL 265</td>
<td>Advanced Clinical Chemistry</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective¹</td>
<td>3</td>
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<td><strong>Semester Total</strong></td>
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### Semester 5

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MDL 266</td>
<td>Clinical Chemistry Techniques</td>
<td>3</td>
</tr>
<tr>
<td>MDL 276</td>
<td>Clinical Hematology Techniques</td>
<td>3</td>
</tr>
<tr>
<td>MDL 277</td>
<td>Clinical Blood Banking Techniques</td>
<td>4</td>
</tr>
<tr>
<td>MDL 278</td>
<td>Clinical Microbiology Techniques II</td>
<td>4</td>
</tr>
<tr>
<td>MDL 298</td>
<td>Seminar and Project</td>
<td>1</td>
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<tr>
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<td><strong>Semester Total</strong></td>
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<tr>
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<td><strong>Total Minimum Credits</strong></td>
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</tr>
</tbody>
</table>

¹ Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s)

### MUSIC

**Career Studies Certificate:**

- Music

The Career Studies Certificate in Music provides students with an introduction to music. It is intended for students who are interested in enhancing their understanding and appreciation of music history and music theory. The program further enhances students’ performance skills in choral and/or instrumental ensemble performance.
CAREER STUDIES: MUSIC (Plan Code: 221.529.01)

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MUS 111</td>
<td>Music Theory I</td>
<td>4</td>
</tr>
<tr>
<td>MUS 121</td>
<td>Music Appreciation I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Applied Music Elective</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Approved Music Ensemble</td>
<td>1-2</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 112</td>
<td>Music Theory II</td>
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<tr>
<td>MUS 122</td>
<td>Music Appreciation II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Applied Music Elective</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Approved Music Ensemble</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>Approved Music Elective</td>
<td>3-4</td>
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<tr>
<td>Semester total</td>
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<td><strong>13-15</strong></td>
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<tr>
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<td><strong>23-26</strong></td>
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</table>

1 Music Theory students are expected to have a basic understanding of reading sheet music notation. Students will take a content review exam upon enrollment in MUS 111 during the first week of classes. Students who do not pass will be advised to enroll in MUS 101 – Basic Musicianship I, for one semester, before enrolling in MUS 111 – Music Theory I. Contact Music Department for details.

2 Applied Music Elective must be taken from the following:
   - MUS 136 – Applied Music – Voice
   - MUS 145 – Applied Music – Keyboard
   - MUS 155 – Applied Music – Woodwinds
   - MUS 165 – Applied Music – Strings
   - MUS 175 – Applied Music – Brass
   - MUS 185 – Applied Music – Percussion
   - MUS 265 – Adv. Applied Music – Strings
   - MUS 275 – Adv. Applied Music – Brass

   Applied Music courses will require additional fees/studio charges for instruction to meet proficiency requirements. Contact Music Department for details.

3 Approved Music Ensemble must be taken from the following:
   - MUS 130 – Jazz Ensemble
   - MUS 137 – Chorus Ensemble
   - MUS 146 – Percussion Ensemble
   - MUS 166 – String Ensemble
   - MUS 237 – Adv. Chorus Ensemble
   - MUS 239 – Adv. Jazz Ensemble
   - MUS 266 – Adv. String Ensemble

4 Approved Music Elective must be taken from the following:
   - MUS 101 – Basic Musicianship I
   - MUS 125 – American Music

NURSING PROGRAM

Associate of Applied Science Degree:
- Nursing

The Associate of Applied Science degree in Nursing prepares students who wish to pursue careers as Registered Nurses (RNs). Graduates may seek employment in acute care, doctor’s offices, health departments, home health services, hospices, long-term care facilities, and mental health and rehabilitation centers. Students take courses in both theoretical and practical applications of nursing care. The program integrates clinical laboratory practice using state-of-the-art patient care simulators and laboratory equipment for enhanced preparation in the field of health care.

Admission to the Nursing program is competitive; therefore, admission to the college does not guarantee admission to the program. Detailed information regarding the admission criteria, selection process, etc. can be found in the Beazley School of Nursing Admissions Procedures and Information Booklet, which can be reviewed or downloaded from the tcc.edu website (search keywords “nursing admission procedures”). Prospective nursing students must also attend a Nursing Program Information Session, which is held on the Portsmouth Campus. Please see the Nursing Program Information Session schedule online at www.tcc.edu (search keywords “nursing information session”).

LPN to RN Options

Licensed Practical Nurses (LPNs) who wish to pursue their RN course work have two options: Articulation or Advanced Placement. Articulation awards credits based on previous learning experiences obtained from approved regional LPN programs following the students’ successful completion of NUR 115 (Transition from LPN to RN Education). Additional information can be found in the Nursing Admission Procedures and Information Booklet or online at www.tcc.edu (search keywords “LPN to RN”).
TCC’s Beazley School of Nursing has been awarded Continuing Accreditation by the Accreditation Commission for Education in Nursing (ACEN), 3343 Peachtree Road NE, Suite 850, Atlanta, GA 30326, (404) 975-5000, www.acenursing.org. The Nursing program is approved by the Virginia Board of Nursing.

ASSOCIATE OF APPLIED SCIENCE DEGREE: NURSING  
(Plan Code: 156)

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIO 141</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
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<td>NUR 108</td>
<td>Nursing Principles and Concepts I</td>
<td>6</td>
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<tr>
<td>NUR 130</td>
<td>Physical Assessment and Basic Pharmacology</td>
<td>3</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Health Care</td>
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<td><strong>Semester Total</strong></td>
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<table>
<thead>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 142</td>
<td>Human Anatomy and Physiology II</td>
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<tr>
<td>NUR 170</td>
<td>Essentials of Medical/Surgical Nursing</td>
<td>4</td>
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<tr>
<td>NUR 180</td>
<td>Essentials of Maternal/Newborn Nursing</td>
<td>4</td>
<td></td>
</tr>
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<td>PSY 201</td>
<td>Introduction to Psychology I (or PSY 200)</td>
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<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NUR 201</td>
<td>Psychiatric Nursing</td>
<td>4</td>
<td></td>
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<tr>
<td>PSY 235</td>
<td>Child Psychology (or PSY 230 or PSY 231)</td>
<td>3</td>
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<tr>
<td><strong>Semester Total</strong></td>
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<table>
<thead>
<tr>
<th>Semester 4</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 150</td>
<td>Introductory Microbiology</td>
<td>4</td>
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<tr>
<td>NUR 270</td>
<td>Essential Nursing Concepts II</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>NUR 271</td>
<td>Essential Nursing Concepts III</td>
<td>4</td>
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<table>
<thead>
<tr>
<th>Semester 5</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NUR 255</td>
<td>Nursing Organization and Management</td>
<td>3</td>
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<tr>
<td>NUR 272</td>
<td>Essential Nursing Concepts IV</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>NUR 273</td>
<td>Essential Nursing Concepts V</td>
<td>4</td>
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<tr>
<td>NUR 299</td>
<td>Supervised Study in Nursing Perspectives</td>
<td>1</td>
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<tr>
<td>PHI 226</td>
<td>Social Ethics (or PHI 220)</td>
<td>3</td>
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<tr>
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<td></td>
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<tr>
<td><strong>Total Minimum Credits</strong></td>
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</tbody>
</table>

OCCUPATIONAL THERAPY ASSISTANT

Associate of Applied Science Degree:

- Occupational Therapy Assistant

The Occupational Therapy Assistant (OTA) program prepares students for entry-level employment as occupational therapy assistants in acute-care hospitals, in-patient and out-patient rehabilitation centers, long-term care facilities, developmental centers, school-based therapy programs, pediatric facilities, and mental health facilities. Graduates of the program are equipped to assist individuals in meeting a level of independence to perform the occupational roles necessary for productive living. Such roles may include tasks related to self-care, work, or leisure for those disabled by illness, accidents, or by developmental or psychiatric impairment.

Admission to the college does not guarantee admission to the OTA program. Entrance requirements for this program include: placement into BIO 141, ENG 111, and MTE 4 or higher; grade point average of 2.75 or higher; 30 hours of documented observation time in at least two separate locations with an occupational therapist (OTR) or an occupational therapy assistant (COTA); and a personal interview with the program director. A writing sample may also be required for admission. For additional information regarding admission, continuance, and graduation requirements, go to www.tcc.edu (search keywords "occupational therapy assistant").

Individuals in the Occupational Therapy Assistant program may elect to pursue professional certification following completion of the A.A.S. The National Board for Certification in Occupational Therapy (NBCOT) offers a national certification examination for the occupational therapy assistant. After successful completion of this exam, the individual will be a Certified Occupational Therapy Assistant (COTA). Most states, including Virginia, require certification in order to practice; however, state licenses are usually based on the results of the NBCOT Certification Examination.

The Occupational Therapy Assistant program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 4720 Montgomery Lane, Suite 200, Bethesda, MD 20814-3449, phone (301) 652-AOTA.

ASSOCIATE OF APPLIED SCIENCE DEGREE: OCCUPATIONAL THERAPY ASSISTANT (Plan Code: 126)

Pre-Admission Semester

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 141</td>
<td>Human Anatomy and Physiology I</td>
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<tr>
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Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HLT 143</td>
<td>Medical Terminology I</td>
<td>3</td>
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<tr>
<td>HLT 150</td>
<td>Cross Cultural Health and Wellness Practices</td>
<td>1</td>
</tr>
<tr>
<td>OCT 100</td>
<td>Introduction to Occupational Therapy</td>
<td>3</td>
</tr>
<tr>
<td>OCT 201</td>
<td>Occupational Therapy with Psychosocial Dysfunction</td>
<td>3</td>
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<tr>
<td>PSY 231</td>
<td>Life Span Human Development I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Health Care</td>
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Semester Total 14

Semester 2

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<td>ENG 111</td>
<td>College Composition I</td>
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<tr>
<td>NAS 177</td>
<td>Upper Extremity Anatomy and Kinesiology</td>
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<tr>
<td>OCT 206</td>
<td>Dyadic and Group Dynamics</td>
<td>3</td>
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<tr>
<td>OCT 225</td>
<td>Neurological Concepts for Occupational Therapy Assistants</td>
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<tr>
<td>PSY 232</td>
<td>Life Span Human Development II</td>
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Semester Total 15

Semester 3

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<tr>
<td>OCT 202</td>
<td>Occupational Therapy with Physical Disabilities</td>
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<tr>
<td>OCT 205</td>
<td>Therapeutic Media</td>
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Semester Total 10

Semester 4

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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCT 190</td>
<td>Coordinated Internship in OT (Physical Dysfunction)</td>
<td>1</td>
</tr>
<tr>
<td>OCT 203</td>
<td>Occupational Therapy with Developmental Disabilities</td>
<td>4</td>
</tr>
<tr>
<td>OCT 207</td>
<td>Therapeutic Skills</td>
<td>4</td>
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<tr>
<td>OCT 208</td>
<td>Occupational Therapy Service Management</td>
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<td>OCT 210</td>
<td>Assistive Technology in Occupational Therapy</td>
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<tr>
<td>OCT 220</td>
<td>Occupational Therapy for the Adult</td>
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Semester Total 16

Semester 5

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<tr>
<td>OCT 290</td>
<td>Coordinated Internship in OT (Psychosocial Dysfunction)</td>
<td>4</td>
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<td>Coordinated Internship in OT (Psychosocial Dysfunction)</td>
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Semester Total 8

Total Minimum Credits 67

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

Due to the limited number of available clinical sites in the region, students may have to travel to a distant site or stay temporarily near a facility.

PARALEGAL STUDIES

Associate of Applied Science Degree:
- Paralegal Studies

Certificate:
- Legal Assistant

Career Studies Certificates:
- Paralegal General Practice Specialist
- Litigation Specialist

The Paralegal Studies program prepares students for careers as paralegals in offices specializing in general practice or litigation. A cooperative education program enables students to earn academic credit and supplement their income while gaining work experience at local sites. Placement test scores should indicate a readiness for ENG 111 prior to registering for any LGL course offering.

The Associate of Applied Science degree in Paralegal Studies prepares students to work as a paralegal in diverse settings. Electives can be selected to enable students to concentrate in general practice, litigation, or a combination of each.

ASSOCIATE OF APPLIED SCIENCE DEGREE: PARALEGAL STUDIES (Plan Code: 260)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ITE 109</td>
<td>Information Systems for Legal Assistants</td>
<td>3</td>
</tr>
<tr>
<td>LGL 110</td>
<td>Introduction to Law and the Legal Assistant</td>
<td>3</td>
</tr>
<tr>
<td>LGL 117</td>
<td>Family Law</td>
<td>3</td>
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<tr>
<td>LGL 200</td>
<td>Ethics for the Legal Assistant</td>
<td>1</td>
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<tr>
<td>MTH 121</td>
<td>Fundamentals of Mathematics I (or higher)</td>
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<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
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Semester Total 17

Semester 2

<table>
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<tbody>
<tr>
<td>ENG 112</td>
<td>College Composition II</td>
<td>3</td>
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<tr>
<td>LGL 125</td>
<td>Legal Research</td>
<td>3</td>
</tr>
<tr>
<td>LGL 130</td>
<td>Law Office Administration and Management</td>
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<tr>
<td>LGL 200</td>
<td>Ethics for the Legal Assistant</td>
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<tr>
<td>Humanities Elective2</td>
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<td>LGL Elective2</td>
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</table>

Semester Total 17

2
### CAREER AND TECHNICAL EDUCATION

#### Tidewater Community College 2015-16 Catalog

<table>
<thead>
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<th>Semester 3</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CST 100</td>
<td>Principles of Public Speaking</td>
<td>3</td>
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<tr>
<td>LGL 126</td>
<td>Legal Writing</td>
<td>3</td>
<td></td>
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<tr>
<td>LGL 216</td>
<td>Trial Preparation and Discovery Practice</td>
<td>3</td>
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</tr>
<tr>
<td>Approved Elective1</td>
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<td>LGL Elective2</td>
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#### Semester 4

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<tr>
<td>LGL 238</td>
<td>Bankruptcy</td>
<td>3</td>
</tr>
<tr>
<td>LGL 297</td>
<td>Cooperative Education (or Business Elective4)</td>
<td>3</td>
</tr>
<tr>
<td>LGL Elective2</td>
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<tr>
<td>LGL Elective2</td>
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<td>Total Minimum Credits</td>
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</table>

1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

2. Before selecting a LGL elective, be sure that you have successfully completed the prerequisite course(s). Students wishing to concentrate in general practice or litigation should select LGL electives from the following lists:
   
   **General Practice:** LGL 115, LGL 221, LGL 225, LGL 235, LGL 236, LGL 250
   
   **Litigation:** LGL 215, LGL 218, LGL 221, LGL 230, LGL 236, LGL 250

3. Approved electives: Any LGL course that is not already applied to the program, ADJ 105, ADJ 201, ADJ 232, ADJ 236, ASL 101, ASL 102, AST 101, ENG 139, HLT 143, PLS 211, PLS 230, PSY 200, and SPA 101 (or higher).

4. Business electives include courses which have the following prefix: ACC, ACQ, AST, BUS, ECO, FIN, GIS, HRI, LGL, ITD, ITE, ITN, ITP, MKT, and REA.

5. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

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### CERTIFICATE: LEGAL ASSISTANT (Plan Code: 261)

The Certificate in Legal Assistant program may lead to entry-level positions in a general practice law firm or as a legal assistant with a trial-work concentration depending upon the selected electives.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ITE 109</td>
<td>Information Systems for Legal Assistants</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>LGL 110</td>
<td>Introduction to Law and the Legal Assistant</td>
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<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
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<td>Family Law</td>
<td>3</td>
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<td>LGL 125</td>
<td>Legal Research</td>
<td>3</td>
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</tr>
<tr>
<td>LGL 235</td>
<td>Legal Aspects of Business Organizations</td>
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<tr>
<td>Semester Total</td>
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### CAREER STUDIES: PARALEGAL GENERAL PRACTICE SPECIALIST (Plan Code: 221.300.02)

The Career Studies Certificate program in Paralegal General Practice Specialist enables students to upgrade their skills if they are currently employed as a legal assistant in general practice law. It gives those who already have a degree the training they need to make a career change.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ITE 109</td>
<td>Information Systems for Legal Assistants</td>
<td>3</td>
<td></td>
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<tr>
<td>LGL 110</td>
<td>Introduction to Law and the Legal Assistant</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>LGL 115</td>
<td>Real Estate Law for Legal Assistants</td>
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<tr>
<td>LGL 200</td>
<td>Ethics for the Legal Assistant</td>
<td>1</td>
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<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>LGL 117</td>
<td>Family Law</td>
<td>3</td>
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<tr>
<td>LGL 125</td>
<td>Legal Research</td>
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<tr>
<td>LGL 235</td>
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</table>
CAREER AND TECHNICAL EDUCATION

CAREER STUDIES: LITIGATION SPECIALIST (Plan Code: 221.260.03)

The Career Studies Certificate program in Litigation Specialist enables students to upgrade their skills if they are currently employed as a litigation legal assistant. It gives those who already have a degree the training they need to make a career change and become a paralegal in a litigation-focused law office, prosecutor’s office, or criminal defense firm. Before enrolling in LGL 126, you must complete ENG 111.

<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td></td>
<td>LGL 126</td>
<td>Legal Writing</td>
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<td></td>
<td>LGL 225</td>
<td>Estate Planning and Probate</td>
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<td></td>
<td>LGL 238</td>
<td>Bankruptcy</td>
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</table>

Semester Total 9

Total Minimum Credits 28

CAREER STUDIES: PERSONAL TRAINING AND FITNESS (Plan Code: 221.460.05)

The Career Studies Certificate in Personal Training and Fitness is based on the standards of American Council on Exercise (ACE) and prepares students for a career in the fitness industry as a Personal Trainer working with clients from school-age children to senior citizens. Graduates will assist clients by assisting them in meeting their physical fitness and wellness goals.

TCC, in collaboration with industry leaders, offers an internship program that allows students an opportunity for practical experience in the fitness industry.

This program prepares students for Personal Trainer Certifications through organizations such as the American Council on Exercise (ACE) and the American College of Sports Medicine (ACSM).

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td>ITE 109</td>
<td>Information Systems for Legal Assistants</td>
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<td>Introduction to Law and the Legal Assistant</td>
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<td></td>
<td>LGL 200</td>
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Semester Total 13

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<tr>
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<td>LGL 125</td>
<td>Legal Research</td>
<td>3</td>
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<td></td>
<td>LGL 215</td>
<td>Torts</td>
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<td></td>
<td>LGL 218</td>
<td>Criminal Law</td>
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<td></td>
<td>LGL 238</td>
<td>Bankruptcy</td>
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Semester Total 25

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<th>Course Title</th>
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<tbody>
<tr>
<td></td>
<td>LGL 126</td>
<td>Legal Writing</td>
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</table>

Total Minimum Credits 28

PERSONAL TRAINING AND FITNESS

Career Studies Certificate:
- Personal Training and Fitness

The Career Studies Certificate in Personal Training and Fitness is based on the standards of American Council on Exercise (ACE) and prepares students for a career in the fitness industry as a Personal Trainer working with clients from school-age children to senior citizens. Graduates will assist clients by assisting them in meeting their physical fitness and wellness goals.

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<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
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<tr>
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<td>HLT 125</td>
<td>Anatomy and Physiology for Exercise Science</td>
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<td></td>
<td>HLT 138</td>
<td>Principles of Nutrition</td>
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<td>HLT 160</td>
<td>Personal Health and Fitness</td>
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<td></td>
<td>PED 101</td>
<td>Fundamentals of Physical Activity I</td>
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Semester Total 13

<table>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td>CST 110</td>
<td>Introduction to Communication</td>
<td>3</td>
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<td></td>
<td>MKT 160</td>
<td>Marketing for Small Business (or MKT 284)</td>
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<td></td>
<td>PED 168</td>
<td>Basic Personal Trainer Preparation</td>
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<td></td>
<td>PED 190</td>
<td>Coordinated Internship in Physical Education</td>
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<tr>
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<td>11</td>
</tr>
</tbody>
</table>

Total Minimum Credits 24

1 MKT 160 is recommended for students wishing to learn about marketing a business. MKT 284 is recommended for students who anticipate working for a fitness facility.

PHARMACY TECHNICIAN

Career Studies Certificate:
- Pharmacy Technician

The Career Studies Certificate program in Pharmacy Technician prepares students to order, stock, package, prepare, and dispense medications under the supervision of a licensed pharmacist. Students will prepare to take the National Pharmacy Technician Certification Examinations in order to become a Certified Pharmacy Technician (CPhT).
Entrance requirements for this program include high school graduation or a GED, MTE 4 or higher placement, and ENG 111 placement on the Virginia Placement Test. For program information, call (757) 822-1122 or (757) 822-2300.

CAREER STUDIES: PHARMACY TECHNICIAN
(Plan Code: 221.190.08)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>AST 101</td>
<td>Keyboarding I</td>
<td>3</td>
</tr>
<tr>
<td>HLT 143</td>
<td>Medical Terminology I</td>
<td>3</td>
</tr>
<tr>
<td>HLT 250</td>
<td>General Pharmacology</td>
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<td>Basic Pharmacy I</td>
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Semester 2

<table>
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<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>MKT 170</td>
<td>Customer Service</td>
<td>2</td>
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<tr>
<td>ITE 115</td>
<td>Introduction to Computer Applications and Concepts</td>
<td>4</td>
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<td>HLT 262</td>
<td>Basic Pharmacy II</td>
<td>3</td>
</tr>
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<td>HLT 290</td>
<td>Coordinated Internship (or HLT 298)</td>
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<tr>
<td>Semester Total</td>
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</tr>
<tr>
<td>Total Minimum Credits</td>
<td></td>
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</tr>
</tbody>
</table>

PHLEBOTOMY

Career Studies Certificate:
- Phlebotomy

The Phlebotomy program prepares students for entry-level employment in hospitals, medical offices, and clinics with training in blood draw and preparation/processing of blood tests.

Admission to the college does not guarantee admission to the Phlebotomy program. For further information regarding admission, continuance and graduation requirements, go to www.tcc.edu (search keyword “phlebotomy”).

CAREER STUDIES: PHLEBOTOMY
(Plan Code: 221.151.02)

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 141</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HLT 141</td>
<td>Introduction to Medical Terminology</td>
<td>2</td>
</tr>
<tr>
<td>MDL 105</td>
<td>Phlebotomy (1st 8-weeks)</td>
<td>3</td>
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<tr>
<td>MDL 106</td>
<td>Clinical Phlebotomy (2nd 8-weeks)</td>
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<tr>
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</table>

PHYSICAL THERAPIST ASSISTANT
Associate of Applied Science Degree:
- Physical Therapist Assistant

The Physical Therapist Assistant (PTA) program is designed for those who wish to enter employment as physical therapist assistants working under the supervision of a physical therapist. Graduates may work in acute care hospitals, skilled nursing facilities, home health agencies, outpatient clinics, rehabilitation hospitals, fitness and wellness centers, public schools, and similar settings.

Admission to the college does not guarantee admission to the PTA program, with 25 to 30 students admitted to the program each fall semester. Selection is highly competitive, and is based on a system of points using several criteria. Entrance requirements include high school graduation or a GED and successful completion of BIO 141, ENG 111, HLT 130, PSY 230, and SDV 101, with achievement in BIO 141 as a key admission determinant. Participation in observation hours in specific health care settings is required and applicants must submit two letters of recommendation related to their preparation for the program.

Official transcripts from other colleges attended must be sent to Tidewater Community College, Central Records Office/Office of the College Registrar, P.O. Box 9000, Norfolk, VA 23509, and be evaluated prior to the application deadline date. For further information regarding admission, continuance and graduation, go to www.tcc.edu (search keywords “physical therapist assistant”).

Licensure is required in most states. In Virginia, program graduates must pass a national licensure examination.


ASSOCIATE OF APPLIED SCIENCE DEGREE: PHYSICAL THERAPIST ASSISTANT
(Plan Code: 180)

Semester 1 Pre-Admission Requirements

<table>
<thead>
<tr>
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<td>Human Anatomy and Physiology I</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>HLT 130</td>
<td>Nutrition and Diet Therapy</td>
<td>1</td>
</tr>
<tr>
<td>PSY 230</td>
<td>Developmental Psychology</td>
<td>3</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Health Care</td>
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Semester 2 (Based on a Fall Semester start)

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<thead>
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<th>Course No.</th>
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<tr>
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<td>PTH 105</td>
<td>Introduction to Physical Therapist Assisting</td>
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</tr>
<tr>
<td>PTH 121</td>
<td>Therapeutic Procedures I</td>
<td>5</td>
</tr>
<tr>
<td>PTH 151</td>
<td>Musculoskeletal Structure and Function</td>
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Semester 3

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<tr>
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<td>Medical Reporting</td>
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<tr>
<td>PTH 115</td>
<td>Kinesiology for the Physical Therapist Assistant</td>
<td>4</td>
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<tr>
<td>PTH 122</td>
<td>Therapeutic Procedures II</td>
<td>5</td>
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<tr>
<td>PTH 131</td>
<td>Clinical Education</td>
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Semester 4

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<th>Course Title</th>
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<tr>
<td>PTH 210</td>
<td>Psychological Aspects of Therapy</td>
<td>2</td>
</tr>
<tr>
<td>PTH 226</td>
<td>Therapeutic Exercise</td>
<td>4</td>
</tr>
<tr>
<td>PTH 227</td>
<td>Pathological Conditions</td>
<td>3</td>
</tr>
<tr>
<td>PTH 251</td>
<td>Clinical Practicum I</td>
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Semester 5

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<tbody>
<tr>
<td>PTH 225</td>
<td>Rehabilitation Procedures</td>
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<tr>
<td>PTH 252</td>
<td>Clinical Practicum II</td>
<td>4</td>
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<tr>
<td>PTH 255</td>
<td>Seminar in Physical Therapy</td>
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<td>Humanities: Elective^1</td>
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<td><strong>Total Minimum Credits</strong></td>
<td><strong>67</strong></td>
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</tbody>
</table>

Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

**RADIOGRAPHY**

**Associate of Applied Science Degree:**
- Radiography

The Radiography program prepares individuals for entry-level employment as radiographers in a variety of health care settings, including hospitals, imaging centers, clinics, doctors' offices, and others.

Entrance requirements for this program include preparation for ENG 111 and MTH 126, as well as successful completion of BIO 141 or its equivalent. The program is highly competitive, and selection is based on a system of points using these criteria, in addition to grades in BIO 141 and 142, SDV 101, and general education courses.

Priority admission is granted to Virginia residents who reside in political subdivisions supported by the college. Call the Information Center at (757) 822-1122 to request a program information packet that will outline all aspects of the program. The packet is also available online (www.tcc.edu, search keywords “radiation packet”). In addition, prospective students are encouraged to attend an Open House session for Radiography, held at 3:00 p.m. on the third Thursday of each month (with the exception of December).

Students are enrolled for six consecutive semesters of full-time study, primarily during daytime hours. The program does not have part-time or evening options. The clinical component of the program requires 1,440 hours of practice in affiliate hospitals, where students must adhere to high standards of professionalism and competence. Prospective students should also be aware that certain medical facilities require both criminal/sex offender background checks, as well as drug screens, prior to being authorized to attend clinical components of the program. The cost of the background check is the student's responsibility.

Program students are required to purchase uniforms, shoes and lead markers for clinical practice.

Program graduates are qualified to apply to the American Registry of Radiologic Technologists (ARRT) to take the national certification exam. Students with a history of certain criminal behavior may not be eligible to become certified by the ARRT. Pre-applications are available from www.arrt.org or (651) 687-0048.


**ASSOCIATE OF APPLIED SCIENCE DEGREE: RADIOPHGRAPHY**

(Plan Code: 172)

<table>
<thead>
<tr>
<th>Pre-Admission Semester</th>
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<tbody>
<tr>
<td>Course No.</td>
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<tr>
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<tr>
<td>BIO 141</td>
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^1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).
Semester 1 (Based on a Summer Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
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<tr>
<td>HLT 150</td>
<td>Cross Cultural Health and Wellness Practices</td>
<td>1</td>
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<tr>
<td>HLT 141</td>
<td>Introduction to Medical Terminology (or HLT 143)</td>
<td>2</td>
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<tr>
<td>RAD 120</td>
<td>Medical Care Procedures and Safety in Radiology</td>
<td>3</td>
</tr>
<tr>
<td>RAD 141</td>
<td>Principles of Radiographic Quality I</td>
<td>4</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Health Care</td>
<td>1</td>
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Semester 2

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<th>Credits</th>
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<tbody>
<tr>
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<td>Human Anatomy and Physiology II</td>
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<td>RAD 121</td>
<td>Radiographic Procedures I</td>
<td>4</td>
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<td>RAD 131</td>
<td>Elementary Clinical Procedures I</td>
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<td>RAD 142</td>
<td>Principles of Radiographic Quality II</td>
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Semester 3

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<td>ENG 111</td>
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<td>Elementary Clinical Procedures II</td>
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<td>RAD 205</td>
<td>Radiation Protection and Radiobiology</td>
<td>3</td>
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<td>RAD 221</td>
<td>Radiographic Procedures II</td>
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Semester 4

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<tr>
<td>RAD 190</td>
<td>Coordinated Internship</td>
<td>3</td>
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<tr>
<td>RAD 245</td>
<td>Radiologic Specialties</td>
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Semester 5

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<th>Course Title</th>
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<tbody>
<tr>
<td>MTH 126</td>
<td>Mathematics for Allied Health (or higher)</td>
<td>3</td>
</tr>
<tr>
<td>RAD 206</td>
<td>Human Disease and Radiography</td>
<td>2</td>
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<tr>
<td>RAD 231</td>
<td>Advanced Clinical Procedures I</td>
<td>5</td>
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<tr>
<td>RAD 255</td>
<td>Radiographic Equipment</td>
<td>3</td>
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Semester 6

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<tr>
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<tbody>
<tr>
<td>PSY 230</td>
<td>Developmental Psychology</td>
<td>3</td>
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<tr>
<td></td>
<td>(or Social Science Elective)</td>
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<tr>
<td>RAD 232</td>
<td>Advanced Clinical Procedures II</td>
<td>5</td>
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<td>RAD 280</td>
<td>Terminal Competencies in Radiography</td>
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<td>Humanities Elective</td>
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</table>

1 Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

RESPIRATORY THERAPY

Associate of Applied Science Degree:
- Respiratory Therapy

The Respiratory Therapy program prepares students to work under the direction of a physician in assisting in diagnosis, treatment, and management of patients with cardiopulmonary disorders, and in helping patients to recover their lung function. Respiratory Care Practitioners (RCPs) deliver medications and oxygen, operate life support machines, and assure that patients have open breathing passages, among other duties. Graduates of the program may seek employment in hospital emergency rooms, intensive care units, outpatient clinics, and home health care.

Admission to the college does not guarantee admission to the Respiratory Therapy program. Entrance requirements for this program include completion of ENG 111, MTE 1-5, high school chemistry or CHM 1, SDV 101, and BIO 141 (BIO 142 is recommended), along with both a college and a Division of Health Professions application. An interview with program faculty is also required. Official transcripts from other colleges attended must be submitted to the Central Records Office at Tidewater Community College prior to the application deadline. For further information regarding admission, continuance, and graduation requirements, go to www.tcc.edu (search keywords “respiratory therapy”).

The Associate of Applied Science degree in Respiratory Therapy prepares students to take the examinations to become a Registered Respiratory Therapist. The Respiratory Therapy Program is accredited by the Commission on Accreditation for Respiratory Care, 1248 Harwood Road, Bedford, Texas, 76021-4244, (817) 283-2835, www.coarc.com.

ASSOCIATE OF APPLIED SCIENCE DEGREE: RESPIRATORY THERAPY (Plan Code 181)

Pre-Admission Semester

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<tr>
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<th>Course Title</th>
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<tr>
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<td>Human Anatomy and Physiology I</td>
<td>4</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>SDV 101</td>
<td>Orientation to Health Care</td>
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### Semester 1 (Based on a Summer Semester start)

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<td>RTH 102</td>
<td>Integrated Sciences for Respiratory Care II</td>
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<td>RTH 120</td>
<td>Fundamental Theory for Respiratory Care</td>
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<td>RTH 131</td>
<td>Respiratory Care Theory and Procedures I</td>
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### Semester 2

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<tr>
<td>BIO 142</td>
<td>Human Anatomy and Physiology II</td>
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<tr>
<td>RTH 121</td>
<td>Cardiopulmonary Science I</td>
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<td>RTH 132</td>
<td>Respiratory Care Theory and Procedures II</td>
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<td>RTH 145</td>
<td>Pharmacology for Respiratory Care I</td>
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<td>RTH 190</td>
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### Semester 3

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<tr>
<td>RTH 217</td>
<td>Pulmonary Rehabilitation, Home Care and Health Promotion</td>
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<td>RTH 235</td>
<td>Diagnostic and Therapeutic Procedures II</td>
<td>3</td>
</tr>
<tr>
<td>RTH 236</td>
<td>Critical Care Monitoring</td>
<td>3</td>
</tr>
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<td>RTH 290</td>
<td>Coordinated Internship</td>
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### Semester 4

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<tr>
<td>RTH 222</td>
<td>Cardiopulmonary Science II</td>
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<td>RTH 290</td>
<td>Coordinated Internship</td>
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### Semester 5

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<tr>
<td>RTH 223</td>
<td>Cardiopulmonary Science III</td>
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<td>RTH 225</td>
<td>Neonatal and Pediatric Respiratory Procedures</td>
<td>3</td>
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<td>RTH 290</td>
<td>Coordinated Internship</td>
<td>3</td>
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<td>Humanities Elective¹</td>
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### Semester 6

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<tr>
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<td>Current Issues in Health Care</td>
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</tr>
<tr>
<td>RTH 290</td>
<td>Coordinated Internship</td>
<td>3</td>
</tr>
<tr>
<td>RTH 298</td>
<td>Seminar and Project in Respiratory Therapy</td>
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</tbody>
</table>

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1. Eligible courses are listed on page 35 in the 2015-2016 catalog. See your academic advisor or counselor to choose the appropriate course(s).

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**RETAIL**

**Career Studies Certificate:**
- Customer Service and Sales
- Retail Management

The Retail programs are designed to include studies leading to a skill set that ranges from sales representative to retail organization and management. The Career Studies Certificate in Customer Service and Sales focuses on the core customer service and sales duties for a broad range of entry-level through first-line supervisory positions across the sales and service industries. The Career Studies Certificate in Retail Management is tailored to those interested in management and supervisory positions within the retail industry.

**CAREER STUDIES: CUSTOMER SERVICE AND SALES**

(Plan Code: 221.212.76)

The Career Studies Certificate in Customer Service and Sales is designed for those interested in customer service and sales positions within the retail industry. Students gain a broad perspective on customer service and sales techniques. The program encompasses a strong theoretical base combined with practical applications such as intense field study, role-plays, case studies, and portfolio development. Graduates from this program who successfully complete the NRF Certification exams will demonstrate that they have the knowledge and skills in the primary disciplines of customer service and sales in the retail industry and are prepared to pursue related careers.

**CAREER STUDIES: RETAIL MANAGEMENT**

(Plan Code: 221.212.26)

The Career Studies Certificate in Retail Management is designed for those interested in management and supervisory positions.
within the retail industry. Students gain a broad perspective on retail organization and oversight, customer service management, supervision techniques, human resource policies and procedures, and sales and marketing. The program encompasses a strong theoretical base combined with practical applications such as intense field study, role-plays, case studies, and portfolio development. Graduates from this program who successfully complete the National Retail Federation (NRF) Certification exam in Retail Management will demonstrate that they have the knowledge and skills necessary in the primary discipline of retail management and are prepared to pursue related careers.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>BUS 117</td>
<td>Leadership Development</td>
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<tr>
<td>BUS 205</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 215</td>
<td>Sales and Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 216</td>
<td>Retail Organization and Management</td>
<td>3</td>
</tr>
<tr>
<td>MKT 260</td>
<td>Customer Service Management</td>
<td>3</td>
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<tr>
<td>SDV 101</td>
<td>Orientation to Business Technology</td>
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1 This course prepares students to sit for the National Retail Federation (NRF) Foundation National Professional Certification in Retail Management.

**Discontinuance pending College Board approval

ASSOCIATE OF APPLIED ARTS DEGREE: STUDIO ARTS
(Plan Code: 532)

Semester 1 (Based on a Fall Semester start)

<table>
<thead>
<tr>
<th>Course No.</th>
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<td>ART 121</td>
<td>Drawing I</td>
<td>3</td>
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<td>ART 131</td>
<td>Fundamentals of Design I</td>
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<td>ART 201</td>
<td>History of Art I</td>
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<tr>
<td>ENG 111</td>
<td>College Composition I</td>
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Semester 2

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<tr>
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<th>Course Title</th>
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<td>ART 134</td>
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<td>ART 202</td>
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<td>ENG 112</td>
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Semester 3

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<td>ART 241</td>
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<td>ART 280</td>
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<td>HIS 111</td>
<td>History of World Civilization</td>
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<td>CST 100</td>
<td>Principles of Public Speaking</td>
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Semester 4

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<td>Portfolio and Resume Preparation</td>
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<td>HIS 112</td>
<td>History of World Civilization</td>
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<td>Mathematics Elective</td>
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</table>

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297*; ART 299*; CRF 102, CRF 105, CRF 130, CRF 131, CRF 199*; CRF 230, CRF 231, PHT 101, PHT 126, PHT 135, PHT 221, PHT 222, PHT 290*, PHT 297*.

* Requires permission of Visual Arts Director

5

Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

### GLASS

The Specialization in Glass provides students with both the historical background and the advances in modern technology relative to glass blowing. Students learn from masters of this craft as they enhance their glass skills in surface design, fusing, slumping and blowing with glass. Graduates are prepared to work as gallery representatives, museum educators, freelance craft persons, or art center instructors. While not designed as a transfer program, courses from the Glass specialization may be transferable to corresponding programs at four-year colleges and universities.

### ASSOCIATE OF APPLIED ARTS DEGREE: STUDIO ARTS
#### Specialization: Glass (Plan Code: 552.04)

#### Semester 1 (Based on a Fall Semester start)

<table>
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<tr>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
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<td>Drawing I</td>
<td>3</td>
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<tr>
<td>ART 131</td>
<td>Fundamentals of Design I</td>
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<td>ART 201</td>
<td>History of Art I</td>
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<td>CRF 130</td>
<td>Glass Blowing I</td>
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**Semester Total** 16

#### Semester 2

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<tr>
<td>CRF 131</td>
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**Semester Total** 15

#### Semester 3

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<td>ART 280</td>
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### CRF 230 Glass Blowing III 3

### HIS 111 History of World Civilization I 3

### Health/Physical Education Elective5 2

**Semester Total** 17

### Total Minimum Credits 66

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5. Students may select any of the following courses to meet this requirement: DIT 121, 125; HLT 100, 105, 106, 110, 116, 121, 130, 138, 141, 150, 160, 200, 204, 215; PED (any activity course).

### PHOTOGRAPHIC MEDIA ARTS

The Specialization in Photographic Media Arts provides students with instruction in current photographic technology, video and related media. Students are provided an opportunity to tell stories, capture moments and communicate through the use of visual images. Students will be introduced to composition, lighting techniques and a variety of camera equipment, hardware and software necessary for the capture, imaging and output of photographic projects. Students will be introduced to techniques and best practices regarding ideation, creative processes and visual problem solving, a skill set mandatory for the highly competitive field of photography. Graduates are prepared for jobs in the photography industry, to include agency photographer, photographer’s assistant, freelance photographer, fine art photographer, and art center educators.
ASSOCIATE OF APPLIED ARTS DEGREE: STUDIO ARTS

Specialization: Photographic Media Arts (Plan Code: 532.03)

Semester 1 (Based on a Fall Semester start)

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<tr>
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<td>PHT 101</td>
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Semester 2

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<td>PHT 110</td>
<td>History of Photography</td>
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<tr>
<td>PHT 126</td>
<td>Introduction to Video Techniques</td>
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<td>PHT 171</td>
<td>Imaging &amp; Concepts in Photographic Media Arts</td>
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Semester 3

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<td>ART 280</td>
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<td>HIS 111</td>
<td>History of World Civilization I</td>
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<td>PHT 201</td>
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<td>Principles of Public Speaking</td>
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Semester 4

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<td>PHT 221</td>
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Assissiation: Pre-Art Therapy (Plan Code: 532.05)

Semester 1 (Based on a Fall Semester start)

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<td>ART 183</td>
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Semester 2

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Semester 3

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<tr>
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<td>Principles of Public Speaking</td>
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<td>HIS 111</td>
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<td>Basic Counseling Skills</td>
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### Semester 4

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<td>Portfolio and Resume Preparation³</td>
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<td>HIS 112</td>
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<td>Abnormal Psychology</td>
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5. * Requires permission of Visual Arts Director.

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### CERAMICS**

Individuals interested in ceramics may pursue the Career Studies Certificate in Ceramics. In this program students are instructed in the historical and contemporary methods of working with clay. Graduates are prepared to work as independent craftspersons, gallery owners, museum educators, or instructors in art centers.

#### CAREER STUDIES: CERAMICS** (Plan Code: 221.597.05)

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ART 131</td>
<td>Fundamentals of Design I</td>
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<td>CRF 101</td>
<td>Hand-Built Pottery</td>
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<td>CRF 105</td>
<td>Introduction to Pottery</td>
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<td>CRF 106</td>
<td>Pottery Glazing and Decorating</td>
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<td>Ceramic Design</td>
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</table>

**Discontinuance pending College Board approval.

### THEATRE ARTS

#### Career Studies Certificates:
- Performance Theatre**
- Technical Theatre**
- Theatre Arts

The Career Studies Certificate options in Technical Theatre, Performance Theatre, and Theatre Arts provide students with an introduction to the theatre arts and hands-on production experience in a variety of theatre spaces including the Chesapeake Studio Theatre, the outdoor Shakespeare in the Grove theatre, and the TCC Roper Performing Arts Center in Norfolk.

#### CAREER STUDIES: PERFORMANCE THEATRE** (Plan Code: 221.529.03)

The Career Studies Certificate in Performance Theatre is focused on acting and directing. Students are instructed in dramatic texts, scene development, vocal techniques for stage, and performance analysis. Graduates are prepared for positions in the theatre, including acting, directing, communications, and public relations.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CST 111</td>
<td>Voice and Diction I</td>
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<td>CST 131</td>
<td>Acting I</td>
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<td>CST 141</td>
<td>Theatre Appreciation I</td>
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<td>CST 233</td>
<td>Rehearsal and Performance I</td>
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<tr>
<td></td>
<td><strong>Total Minimum Credits</strong></td>
<td><strong>27</strong></td>
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</tr>
</tbody>
</table>

1. Electives must be chosen from the following courses: CST 145 – Stagecraft
   CST 290 – Coordinated Internship in Theatre Arts

** Discontinuance pending College Board approval.
CAREER STUDIES: TECHNICAL THEATRE** (Plan Code: 221.529.04)

The Career Studies Certificate in Technical Theatre covers technical aspects of theatre production such as stage management, scenic and lighting design, set construction, stage lighting, and sound. Graduates are prepared for positions such as shop technician, sound and lighting technician, carpentry apprentice, and stage hand.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CST 141</td>
<td>Theatre Appreciation I</td>
<td>3</td>
</tr>
<tr>
<td>CST 251</td>
<td>Stage Lighting and Sound</td>
<td>3</td>
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Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CST 233</td>
<td>Rehearsal and Performance I</td>
<td>3</td>
</tr>
<tr>
<td>CST 145</td>
<td>Stagecraft</td>
<td>3</td>
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<tr>
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<td>Approved Theatre Elective¹</td>
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Semester 3

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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CST 234</td>
<td>Rehearsal and Performance II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Theatre Elective¹</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Theatre Elective¹</td>
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</table>

¹ Electives must be chosen from the following courses:
CST 241 – Introduction to Directing I
CST 290 – Coordinated Internship in Theatre Arts

**Discontinuance pending College Board approval.

CAREER STUDIES: THEATRE ARTS  (Plan Code: 221.529.02)

The Career Studies Certificate in Theatre Arts provides students with an introduction to the theatre arts and hands-on production experience in a variety of theatre spaces including the Chesapeake Studio Theatre and the TCC Roper Performing Arts Center in Norfolk. Students are introduced to performance and technical aspects of theatre production and select approved electives from one of these areas to gain additional exposure. Graduates are prepared for positions as actors, directors’ assistants, communications and public relations representatives, set designers, shop technicians, sound and lighting technicians, and comparable theatre-related roles.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CST 141</td>
<td>Theatre Appreciation I</td>
<td>3</td>
</tr>
<tr>
<td>CST 233</td>
<td>Rehearsal and Performance I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Theatre Elective¹</td>
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Semester 2

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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CST 234</td>
<td>Rehearsal and Performance II</td>
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<tr>
<td></td>
<td>Approved Theatre Elective¹</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Theatre Elective¹</td>
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</table>

¹ Students interested in performance theatre must select 15 credits from the following: CST 111, 131, 132, 145, 241, 266, 290.

Students interested in technical theatre must select 15 credits from the following: CST 145, 241, 251, 266, 290.

TRUCK DRIVING

Career Studies Certificate:

- Truck Driving

The certificate in Truck Driving prepares students to obtain a Class A commercial driver’s license (CDL) which allows them to drive tractor trailer trucks. In addition, it will allow them to drive Class B trucks such as buses, dump trucks, and straight trucks. The program offers day and evening sessions. It operates on an eight-week, five-days-a-week schedule, and simulates the working environment. Contact the Truck Driving program office at 757-822-2428 for the admissions package. Students must have a valid Virginia driver’s license and a record free of serious violations. Students must also pass a Department of Transportation physical and drug/alcohol screening.
CAREER STUDIES: TRUCK DRIVING (Plan Code 221.279.02)

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>SDV 106</td>
<td>Preparation for Employment</td>
<td>1</td>
</tr>
<tr>
<td>TRK 101</td>
<td>DOT Safety Rules and Regulations</td>
<td>2</td>
</tr>
<tr>
<td>TRK 102</td>
<td>Preventive Maintenance for Truck Drivers</td>
<td>1</td>
</tr>
<tr>
<td>TRK 103</td>
<td>Tractor Trailer Driving</td>
<td>9</td>
</tr>
<tr>
<td>TRK 110</td>
<td>Survey of the Trucking Industry</td>
<td>3</td>
</tr>
<tr>
<td>Total Minimum Credits</td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

Total Minimum Credits 16

VETERINARY ASSISTANT

Career Studies Certificate:
• Veterinary Assistant

The Career Studies Certificate program in Veterinary Assistant prepares students to assist and support licensed veterinary technicians and veterinarians in the health and handling of a variety of small domestic animals and exotic species. Veterinary Assistants perform receptionist functions, assist in filling prescriptions, keep exam rooms and kennels cleaned and prepped, set up lab work, assist with inventory, update medical records, assist with nursing care, assist with surgical preparation and procedure, assist with radiography, interact with clients, etc. The college plans to apply for the Approved Veterinary Assistant (AVA) designation through the National Association of Veterinary Technicians in America (NAVTA).

Upon graduation from a NAVTA approved Veterinary Assistant Program, a participant is eligible to sit for the Approved Veterinary Assistant (AVA) examination. Upon successful completion of the exam, the participant would be entitled to use the designationAVA and would receive a documenting certificate.

Admission to the college does not guarantee admission to the Veterinary Assistant Program, with 15-18 students admitted to the program each fall semester. Selection is highly competitive with entrance requirements to include high school graduation or a GED, college admission, a letter of recommendation from a veterinarian or a licensed veterinary technician, a letter documenting five hours of volunteering in a veterinary hospital or clinic within the last year, and placement into ENG 111 and MTE 4 or higher on the College Placement Test. Call (757) 822-7260 to request a program information packet that will outline all aspects of the program.

CAREER STUDIES: VETERINARY ASSISTANT (Plan Code 221.188.04)

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>VET 101</td>
<td>Introduction to Veterinary Assisting</td>
<td>3</td>
</tr>
<tr>
<td>VET 103</td>
<td>Veterinary Office Assisting</td>
<td>3</td>
</tr>
<tr>
<td>VET 190</td>
<td>Coordinated Internship in Veterinary Assisting</td>
<td>1</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
</tr>
<tr>
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<tr>
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Semester 2

<table>
<thead>
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<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>VET 100</td>
<td>Introduction to Animal Science</td>
<td>4</td>
</tr>
<tr>
<td>VET 102</td>
<td>Care and Maintenance of Small Domestic Animals</td>
<td>3</td>
</tr>
<tr>
<td>VET 190</td>
<td>Coordinated Internship in Veterinary Assisting</td>
<td>3</td>
</tr>
<tr>
<td>Semester Total</td>
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</tr>
<tr>
<td>Total Minimum Credits</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

WELDING

Certificate:
• Welding

Career Studies Certificates:
• Welding
• Maritime Welding

The Welding programs prepare students for employment in the welding industry. Two tracks are offered: a general welding focus and a maritime welding focus. Graduates are provided education and training for environments such as shipyards, utilities, manufacturing, marine, and oil refineries.

A moderate level of manual dexterity and an average mechanical aptitude are helpful. Prospective welding students should contact the Welding Department at 822-2300 for prior approval before enrolling.

CERTIFICATE: WELDING (Plan Code 995)

The Certificate in Welding builds on the skills presented in the Career Studies Certificate in Welding. In addition to learning about college success skills, students gain competencies in English and math.

Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 111</td>
<td>College Composition I</td>
<td>3</td>
</tr>
<tr>
<td>WEL 117</td>
<td>Oxyfuel Welding and Cutting</td>
<td>3</td>
</tr>
<tr>
<td>WEL 123</td>
<td>Shielded Metal Arc Welding (Basic)</td>
<td>3</td>
</tr>
<tr>
<td>WEL 141</td>
<td>Welder Qualification Tests I</td>
<td>3</td>
</tr>
<tr>
<td>Semester Total</td>
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### Semester 2

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<tbody>
<tr>
<td>MTH 103</td>
<td>Applied Technical Mathematics I</td>
<td>3</td>
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<tr>
<td>WEL 124</td>
<td>Shielded Metal Arc Welding (Advanced)</td>
<td>3</td>
</tr>
<tr>
<td>WEL 136</td>
<td>Welding III (Inert Gas)</td>
<td>2</td>
</tr>
<tr>
<td>WEL 142</td>
<td>Welder Qualification Tests II</td>
<td>3</td>
</tr>
<tr>
<td>SDV 100</td>
<td>College Success Skills</td>
<td>1</td>
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### Semester 3

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<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>WEL 126</td>
<td>Pipe Welding I (ARC)</td>
<td>3</td>
</tr>
<tr>
<td>WEL 135</td>
<td>Inert Gas Welding</td>
<td>2</td>
</tr>
<tr>
<td>WEL 138</td>
<td>Pipe and Tube Welding (TIG)</td>
<td>2</td>
</tr>
<tr>
<td>WEL 150</td>
<td>Welding Drawing and Interpretation</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
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<tr>
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<td><strong>Total Minimum Credits</strong></td>
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</table>

### CAREER STUDIES: WELDING (Plan Code: 221.995.01)

The Career Studies Certificate in Welding prepares students for immediate employment in a number of industrial environments, including shipyards, utilities, manufacturing firms, and oil refineries. Students are introduced to various types of equipment and materials used in welding. Successful completers may qualify as tack welders or as journeyman welders. Students qualifying as a journeyman may successfully pass the AWS Journeyman Certification tests.

#### Semester 1

<table>
<thead>
<tr>
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<th>Course Title</th>
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</thead>
<tbody>
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<td>3</td>
</tr>
<tr>
<td>WEL 141</td>
<td>Welder Qualification Tests I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Total</strong></td>
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#### Semester 2

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>WEL 124</td>
<td>Shielded Metal Arc Welding (Advanced)</td>
<td>3</td>
</tr>
<tr>
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<td>Welding III (Inert Gas)</td>
<td>2</td>
</tr>
<tr>
<td>WEL 142</td>
<td>Welder Qualification Tests II</td>
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#### Semester 3

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>WEL 126</td>
<td>Pipe Welding I (ARC)</td>
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<tr>
<td>WEL 135</td>
<td>Inert Gas Welding</td>
<td>2</td>
</tr>
<tr>
<td>WEL 138</td>
<td>Pipe and Tube Welding (TIG)</td>
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</tr>
<tr>
<td>WEL 150</td>
<td>Welding Drawing and Interpretation</td>
<td>2</td>
</tr>
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<tr>
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</tbody>
</table>

### CAREER STUDIES: MARITIME WELDING (Plan Code: 221.953.30)

The Career Studies Certificate in Maritime Welding prepares students for entry-level positions as maritime welders. While some welding skills are universal, this program will focus specifically on developing the knowledge, skills, and abilities needed to obtain employment as a maritime welder.

#### Semester 1

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MAR 120</td>
<td>Introduction to Ship Systems</td>
<td>3</td>
</tr>
<tr>
<td>WEL 165</td>
<td>Introduction to Maritime Welding</td>
<td>2</td>
</tr>
<tr>
<td>WEL 170</td>
<td>Maritime Shielded Metal Arc Fillet Welding (SMAW I)</td>
<td>3</td>
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<td><strong>Semester Total</strong></td>
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#### Semester 2

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<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>WEL 171</td>
<td>Maritime Shielded Metal Arc Groove Welding (SMAW II)</td>
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<tr>
<td>WEL 210</td>
<td>Maritime Flux Core Arc Fillet Welding (FCAW)</td>
<td>3</td>
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#### Semester 3

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>WEL 220</td>
<td>Maritime Gas Metal Arc Fillet Welding (GMAW)</td>
<td>3</td>
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<tr>
<td>WEL 230</td>
<td>Maritime Gas Tungsten Arc Fillet Welding (GTAW)</td>
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</tbody>
</table>
GENERAL USAGE COURSES

These courses are used in all disciplines by using the appropriate course prefix with a specific discipline or course content title.

→ 90-190-290 | 1-5 credits
Coordinated Internship In
Supervises on-the-job training in selected business, industrial, or service firms coordinated by the college. Credit/practice ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

→ 93-193-293 | 1-5 credits
Studies In
Covers new content not covered in existing courses in the discipline. Allows instructor to explore content and instructional methods to assess the course's viability as a permanent offering. Variable hours per week.

→ 95-195-295 | 1-5 credits
Topics In
Provides an opportunity to explore topic areas of an evolving nature or of short-term importance in the discipline. Variable hours per week.

→ 96-196-296 | 1-5 credits
On-Site Training In
Offers opportunities for career orientation and training without pay in selected businesses and industry. Supervised and coordinated by the college. Credit/work ratio not to exceed 1:5 hours. Variable hours per week.

→ 97-197-297 | 1-5 credits
Cooperative Education In
Provides on-the-job training for pay in approved business, industrial, and service firms. Applies to all career-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. Variable hours per week.

→ 98-198-298 | 1-5 credits
Seminar and Project In
Requires completion of a project or research report related to the student's occupational objective and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours per week.

→ 99-199-299 | 1-5 credits
Supervised Study In
Assigns problems for independent study outside the normal classroom setting under the guidance and direction of an instructor. Incorporates prior experience and instruction in the discipline. Variable hours per week.

ACCOUNTING

→ ACC 100 | 5 credits
Introduction to Bookkeeping
Presents the accounting cycle, focusing on the routine recording of data in journals and ledgers. Includes payroll preparation and practical procedures. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

→ ACC 124 | 3 credits
Payroll Accounting
Presents accounting systems and methods used in computing and recording payroll to include payroll taxes and compliance with federal and state legislation. Lecture 3 hours per week.

→ ACC 210 | 3 credits
Advanced Bookkeeping
Emphasizes the complexities of bookkeeping. Stresses methods to avoid typical pitfalls in preparation for the Certified Bookkeeper Exam. Lecture 3 hours per week.

→ ACC 211 | 3 credits
Principles of Accounting I
Introduces accounting principles with respect to financial reporting. Demonstrates how decision makers use accounting information for reporting purposes. Focuses on the preparation of accounting information and its use in the operation of organizations, as well as methods of analysis and interpretation of accounting information. Prerequisite: Placement into MTH 121 or higher. Lecture 3 hours per week.
→ ACC 212 | 3 credits  
**Principles of Accounting II**  
Introduces accounting principles with respect to cost and managerial accounting. Focuses on the application of accounting information with respect to product costing, as well as its use within the organization to provide direction and to judge performance. **Prerequisite:** ACC 211. Lecture 3 hours per week.

→ ACC 215 | 3 credits  
**Computerized Accounting**  
Introduces the computer in solving accounting problems. Focuses on operation of computers. Presents the accounting cycle and financial statement preparation in a computerized system and other applications for financial and managerial accounting. **Prerequisite:** ACC 211 or equivalent. Lecture 3 hours per week.

→ ACC 220 | 3 credits  
**Accounting for Small Business**  
Presents practical accounting procedures for small business operations including service occupations, retail stores, and manufacturing operations. Covers the accounting cycle, journals, ledgers, preparation of financial statements and payroll, and checking account management. Includes regulations applicable to payroll, self-employment, social security and other taxes. **Lecture 3 hours per week.**

→ ACC 221 | 4 credits  
**Intermediate Accounting I**  
Covers accounting principles and theory, including a review of the accounting cycle and accounting for current assets, current liabilities and investments. Introduces various accounting approaches and demonstrates the effect of these approaches on the financial statement users. Expands theory and practice of accounting principles in prerequisite courses. **Prerequisite:** ACC 212 or equivalent. Lecture 4 hours per week.

→ ACC 222 | 4 credits  
**Intermediate Accounting II**  
Continues accounting principles and theory with emphasis on accounting for fixed assets, intangibles, corporate capital structure, long-term liabilities, and investments. **Prerequisite:** ACC 221 or equivalent. Lecture 4 hours per week.

→ ACC 231 | 3 credits  
**Cost Accounting I**  
Studies cost accounting methods and reporting as applied to job order, process, and standard cost accounting systems. Includes cost control and other topics. Explores the development of cost accounting tools and techniques necessary for effective decision making. **Prerequisite:** ACC 212 or equivalent. Lecture 3 hours per week.

→ ACC 241 | 3 credits  
**Auditing I**  
Presents techniques of investigating, interpreting, and appraising accounting records and assertions. Studies internal control design and evaluation, evidence-gathering techniques and other topics. **Prerequisite or co-requisite:** ACC 212 or equivalent. Lecture 3 hours per week.

→ ACC 261 | 3 credits  
**Principles of Federal Taxation I**  
Presents the study of federal taxation as it relates to individuals and related entities. Includes tax planning, compliance, and reporting. **Lecture 3 hours per week.**

→ ACC 262 | 3 credits  
**Principles of Federal Taxation II**  
Presents the study of federal taxation as it relates to partnerships, corporations, and other tax entities. Includes tax planning, compliance, and reporting. **Prerequisites:** ACC 211 and ACC 261. Lecture 3 hours per week.

**ACQUISITION**

→ ACQ 121 | 3 credits  
**Introduction to Acquisition and Procurement Fundamentals I**  
Introduces technical and fundamental procedures of government acquisition and procurement. Focuses on appropriations and funding, competition requirements, types of specifications, small business and labor surplus areas, pre-solicitation considerations, solicitations, and contractor qualifications. **Lecture 3 hours per week.**
→ **ACQ 122** | 3 credits  
**Introduction to Acquisition and Procurement Fundamentals II**  
Presents technical and fundamental procedures basic to government acquisition and procurement. Focuses on sealed bidding, types of contracts, pricing policies and techniques, contracting by negotiation, contract administration, contractor performance, government contract quality assurance, termination of government contracts, protest, disputes, appeals, and contract close-out.  
**Prerequisite:** ACQ 121. **Lecture 3 hours per week.**

→ **ACQ 215** | 3 credits  
**Contract Law**  
Studies government contract law. Applies basic legal aspects and principles of law associated with contracting and the administration of contracts. Emphasizes the dispute process, including administrative and judicial methods of resolution of contract disputes. Focuses on modifications, award law, government property, defective pricing data, patent and data law, and labor law. **Lecture 3 hours per week.**

→ **ACQ 218** | 3 credits  
**Negotiations of Contracts and Contract Modification**  
Presents principles of preparation for and conducting of negotiations for contracts and contract modification. Applies value systems, strategies, rationale, and personal interactions during negotiations, and methods of reaching fair and equitable agreements. (For those institutions certified, satisfies requirements of the mandatory DOD course: Contract Pricing, when combined with ACQ 216 and DOD materials.) **Lecture 3 hours per week.**

→ **ACQ 221** | 3 credits  
**Advanced Acquisition and Procurement Management I**  
Studies advanced areas of acquisition planning, government provided property, sealed bidding, funding, and acquisition of information resources. Emphasizes interactions with service contracts, value engineering, commercial activities, technical requirements, construction requirements, and socio-economic programs. **Prerequisite:** ACQ 121. **Lecture 3 hours per week.**

→ **ACQ 231** | 3 credits  
**Principles of Contract Pricing and Negotiations I**  
Covers the environment in which cost and price analysis takes place, sources of data for cost and price analysis, methods for analyzing direct and indirect costs, methods for performing profit analysis, and a selection of current pricing topics. **Lecture 3 hours per week.**

→ **ACQ 232** | 3 credits  
**Principles of Contract Pricing and Negotiations II**  
Continues the environment in which cost and price analysis takes place. Includes individual and group negotiation activities, which address the fundamentals of the negotiation process, essential techniques, strategies, and tactics. **Prerequisite:** ACQ 231. **Lecture 3 hours per week.**

→ **ACQ 235** | 3 credits  
**Contract Administration**  
Provides an intense review of important areas in post-award contract management. Focuses on the administration of government contracts as related to the different kinds of contracts, contract changes, contract modification, administrative procedures for disputes and terminations, specification, inspecting and acceptances, and close-out. (For those institutions certified, satisfies requirements of the mandatory DOD course, Intermediate Contract Administration, when combined with DOD materials.) **Prerequisite:** ACQ 121. **Lecture 3 hours per week.**

→ **ADJ 105** | 3 credits  
**The Juvenile Justice System**  
Presents the evolution, philosophy, structures and processes of the American juvenile delinquency system; surveys the rights of juveniles, dispositional alternatives, rehabilitation methods and current trends. **Lecture 3 hours per week.**

→ **ADJ 110** | 3 credits  
**Introduction to Law Enforcement**  
Studies the philosophy and history of law enforcement, presenting an overview of the crime problem and policy response issues. Surveys the jurisdictions and organizations of local, state, and federal law enforcement agencies. Examines the qualification requirements and career opportunities in the law enforcement profession. **Lecture 3 hours per week.**
ADJ 111 | 3 credits
Law Enforcement Organization and Administration I
Teaches the principles of organization and administration of law enforcement agencies. Studies the management of line operations, staff and auxiliary services, investigative and juvenile units. Introduces the concept of data processing; examines policies, procedures, rules, and regulations pertaining to crime prevention. Surveys concepts of protection of life and property, detection of offenses, and apprehension of offenders. **Lecture 3 hours per week.**

ADJ 127 | 3 credits
Firearms and Marksmanship
Surveys lethal weapons in current use and current views on weapon types and ammunition design. Examines the legal guidelines as to the use of deadly force, safety in handling of weaponry, and weapon care and cleaning; marksmanship instruction under standard range conditions. **Prerequisite:** Instructor permission. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

ADJ 133 | 3 credits
Ethics and the Criminal Justice Professional
Examines ethical dilemmas pertaining to the criminal justice system, including those in policing, courts and corrections. Focuses on some of the specific ethical choices that must be made by the criminal justice professional. **Lecture 3 hours per week.**

ADJ 140 | 3 credits
Introduction to Corrections
Focuses on societal responses to the offender. Traces the evolution of practices based on philosophies of retribution, deterrence, and rehabilitation. Reviews contemporary correctional activities and their relationships to other aspects of the criminal justice system. **Lecture 3 hours per week.**

ADJ 201 | 3 credits
Criminology
Studies current and historical data pertaining to criminal and other deviant behavior. Examines theories that explain crime and criminal behavior in human society. **Lecture 3 hours per week.**

ADJ 211-212 | 3 credits each
Criminal Law, Evidence and Procedures I-II
Teaches the elements of proof for major and common crimes and the legal classification of offenses. Studies the kinds, degrees and admissibility of evidence and its presentation in criminal proceedings with emphasis on legal guidelines for methods and techniques of evidence acquisition. Surveys the procedural requirements from arrest to final disposition in the various American court systems with focus on the Virginia jurisdiction. **Lecture 3 hours per week.**

ADJ 231 | 3 credits
Community Policing
Examines the history of police-community relations and the role of both the community and the police in establishing a crime fighting partnership for success. Emphasizes building relationships between police officers and the community they serve. Includes case studies from various cities that have undertaken the philosophy of community policing. **Lecture 3 hours per week.**

ADJ 232 | 3 credits
Domestic Violence
Surveys historical issues that have affected family violence. Examines current trends in the context of the criminal justice system. **Lecture 3 hours per week.**

ADJ 234 | 3 credits
Terrorism and Counter-Terrorism
Surveys the historical and current practices of terrorism that are national, transnational, or domestic in origin. Includes biological, chemical, nuclear, and cyber-terrorism. Teaches the identification and classification of terrorist organizations, violent political groups and issue-oriented militant movements. Examines investigative methods and procedures utilized in counter terrorist efforts domestically and internationally. **Lecture 3 hours per week.**

ADJ 236 | 3 credits
Principles of Criminal Investigation
Surveys the fundamentals of criminal investigation procedures and techniques. Examines crime scene search, collecting, handling and preserving of evidence. **Lecture 3 hours per week.**
→ **ADJ 247 - Criminal Behavior | 3 credits**
Introduces and evaluates the concepts of normal and abnormal behavior. Focuses on the psychological and sociological aspects of criminal and other deviant behavior patterns. **Lecture 3 hours per week.**

**ADMINISTRATIVE SUPPORT TECHNOLOGY**

→ **AST 55 | 1 credit**
Certification Preparation
Serves as a review of objectives for a specific certification. Uses certification test preparation software, when available, in conjunction with a faculty resource person. May be repeated for credit. **Lecture 1 hour per week.**

→ **AST 101 | 3 credits**
Keyboarding I
Teaches the alpha/numeric keyboard with emphasis on correct techniques, speed, and accuracy. Teaches formatting of basic personal and business correspondence, reports, and tabulation. **Lecture 3 hours per week.**

→ **AST 102 | 3 credits**
Keyboarding II
Develops keyboarding and document production skills with emphasis on preparation of specialized business documents. Continues skill-building for speed and accuracy. **Prerequisite: AST 101. Lecture 3 hours per week.**

→ **AST 117 | 1 credit**
Keyboarding for Computer Usage
Teaches the alphabetic keyboard and 10-key pad. Develops correct keying techniques. **Lecture 1 hour per week.**

→ **AST 132 | 1 credit**
Word Processing I (Microsoft Office Word)
Introduces students to a word processing program to create, edit, save and print documents. **Lecture 1 hour per week.**

→ **AST 141 | 4 credits**
Word Processing (Microsoft Office Word)
Teaches creating and editing documents, including line and page layouts, columns, fonts, search/replace, cut/paste, spell/thesaurus, and advanced editing and formatting features of word processing software. **Prerequisite: AST 101 or equivalent. Lecture 4 hours per week.**

→ **AST 150 | 1 credit**
Desktop Publishing I (Microsoft Office Word)
Presents desktop publishing features including page layout and design, font selection, and use of graphic images. **Lecture 1 hour per week.**

→ **AST 154 | 1 credit**
Voice Recognition Applications
Teaches the computer user to use the voice as an input device to compose documents and to give commands directly to the computer. **Lecture 1 hour per week.**

→ **AST 201 | 3 credits**
Keyboarding III
Develops decision-making skills, speed, and accuracy in production keying. Applies word processing skills in creating specialized business documents. **Prerequisite: AST 102. Lecture 3 hours per week.**

→ **AST 205 | 3 credits**
Business Communications
Teaches techniques of oral and written communications. Emphasizes writing and presenting business-related material. **Prerequisite: ENG 111. Lecture 3 hours per week.**

→ **AST 234 | 3 credits**
Records and Database Management
Teaches filing and records management procedures using microcomputer database software. Incorporates both manual and electronic methods for managing information. **Lecture 3 hours per week.**

→ **AST 236 | 4 credits**
Specialized Software Applications
Teaches specialized integrated software applications on the microcomputer. Emphasizes document production to meet business and industry standards. **Prerequisite: AST 101 or equivalent. Lecture 4 hours per week.**
→ AST 242 | 3 credits  
Medical Insurance and Coding  
Teaches coding for medical services rendered within a medical office setting utilizing current coding books for maximum reimbursement. Prerequisite: HLT 143. Lecture 3 hours per week.

→ AST 243 | 3 credits  
Office Administration I  
Develops an understanding of the administrative support role and the skills necessary to provide organizational and technical support in a contemporary office setting. Emphasizes the development of critical thinking, problem-solving, and job performance skills in a business office environment. Prerequisite: AST 101. Lecture 3 hours per week.

→ AST 244 | 3 credits  
Office Administration II  
Enhances skills necessary to provide organizational and technical support in a contemporary office setting. Emphasizes administrative and supervisory role of the office professional. Includes travel and meeting planning, office budgeting and financial procedures, international issues, and career development. Prerequisite: AST 243 or equivalent. Lecture 3 hours per week.

→ AST 245 | 3 credits  
Medical Machine Transcription  
Develops machine transcription skills, integrating operation of transcribing equipment with understanding of medical terminology. Emphasizes dictation techniques and accurate transcription of medical documents in prescribed formats. Prerequisites: AST 102 or equivalent and HLT 143. Lecture 3 hours per week.

→ AST 257 | 4 credits  
WP Desktop Publishing (Microsoft Office Word)  
Uses word processing software to teach advanced document preparation. Prerequisite: AST 101. Lecture 4 hours per week.

→ AST 271 | 3 credits  
Medical Office Procedures I  
Covers medical office procedures, records management, preparation of medical reports, and other medical documents. Co-requisite: AST 102 or equivalent. Lecture 3 hours per week.

AIR CONDITIONING AND REFRIGERATION

→ AIR 111-112 | 3 credits each  
Air Conditioning and Refrigeration Controls I-II  
Presents electron theory, magnetism, Ohm’s Law, resistance, current flow, instruments for electrical measurement, A.C. motors, power distribution controls and their application. Co-requisite for AIR 111: AIR 121. Prerequisite for AIR 112: AIR 111. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ AIR 116 | 2 credits  
Duct Construction and Maintenance  
Presents duct materials including sheet metal, aluminum, and fiber glass. Explains development of duct systems, layout methods, safety hand tools, cutting and shaping machines, fasteners and fabrication practices. Includes duct fittings, dampers and regulators, diffusers, heater and air washers, fans, insulation, and ventilating hoods. Prerequisite or co-requisite: AIR 165. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ AIR 121-122 | 3 credits each  
Air Conditioning and Refrigeration I-II  
Studies refrigeration theory, characteristics of refrigerants, temperature, and pressure, tools and equipment, soldering, brazing, refrigeration systems, system components, compressors, evaporators, and metering devices. Presents charging and evaluation of systems and leak detection. Explores servicing the basic system. Explains use and care of oils and additives and troubleshooting of small commercial systems. Co-requisite for AIR 121: AIR 111. Prerequisite for AIR 122: AIR 121. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ AIR 154 | 3 credits  
Heating Systems I  
Introduces types of fuels and their characteristics of combustion; types, components and characteristics of burners, and burner efficiency analyzers. Studies forced air heating systems including troubleshooting, preventive maintenance and servicing. Co-requisite: AIR 111. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.
AIR 158 | 2 credits
Mechanical Codes
Presents mechanical code requirements for installation, service, and inspection procedures. Uses the BOCA code in preparation for the master’s card. Lecture 2 hours per week.

AIR 159 | 1 credit
Heating and Cooling Safety
Presents standard safety procedures used in the heating and cooling industry. Discusses proper handling of equipment refrigerants and electricity. Lecture 1 hour per week.

AIR 160 | 2 credits
Introduction to Indoor Air Quality
Examines the common sources of indoor air contaminants (pollutants), minimum ventilation rate requirements, and the analysis of properties of indoor air in residential and commercial buildings. Covers methods of air properties, data collection, data analysis, and the implementation of Heating, Ventilation, and Air Conditioning (HVAC) systems performance remediation techniques. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

AIR 161 | 3 credits
Heating, Air, and Refrigeration Calculations I
Introduces fractions, decimals, sign of operations, equations, Ohm’s Law, subtraction, multiplication and division of signed numbers. Teaches fundamentals of algebra, expression of stated problems in mathematical form, and solutions of equations. Lecture 3 hours per week.

AIR 163 | 3 credits
Heating Systems for Energy Auditors
Presents methods for evaluating residential gas and oil heating systems. Prepares students to explain how combustion air availability is affected by the efficiency of structure construction and to describe how ductwork efficiency affects overall heating system performance. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

AIR 164 | 3 credits
Residential Energy Auditing
Explains the interaction among building components and mechanical systems, discusses how air sealing in a home can affect indoor air quality, and explains methods used to recognize typical air leakage sites and how to correct them. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

AIR 165 | 3 credits
Air Conditioning Systems I
Introduces comfort survey, house construction, load calculations, types of distribution systems, and equipment selection. Introduces designing, layout, installing and adjusting of duct systems, job costs, and bidding of job. Prerequisite: AIR 161. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

AIR 168 | 3 credits
Mechanical Systems for Multi-Family Dwellings
Presents concepts of a residential dwelling as a system. Covers the location and function of the dwelling envelope and the ability to identify common sources of residential dwelling heat losses and gains. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

AIR 178 | 3 credits
Fundamentals of Weatherization for Installers and Technicians
Presents weatherization designed to reduce waste, increase comfort, improve durability, and enhance the health and safety of residential dwelling occupants. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

AIR 179 | 3 credits
Weatherization Inspection and Monitoring
Covers residential dwelling energy usage, potential areas for energy conservation, the cost-effectiveness of retrofits, the purpose of performing an energy audit, and education of the consumer. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

AIR 181 | 2 credits
Planning and Estimating I
Presents fundamentals of blueprint reading as applied to the building trades. Emphasizes air conditioning distribution, designing and drawing residential and commercial systems, take-off of materials and estimating the cost of the systems. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

AIR 200 | 2 credits
Hydronics
Presents design and installation of hydronic systems for heating and cooling. Includes steam heated and chilled water systems. Primarily concerns systems using water under forced circulation. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.
→ **AIR 206 | 3 credits**  
**Psychrometrics**  
Studies air and its properties, characteristics and measurements as they apply to human comfort. Considers control of temperature, humidity and distribution of air and air mixtures. *Prerequisite: AIR 121. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.*

→ **AIR 207 | 3 credits**  
**Heat Loads and Psychrometrics**  
Studies air and its properties, characteristics and measurements as they apply to human comfort. Considers control of temperature, humidity and distribution of air and air mixtures. Studies heat loss and heat gain factors. Considers the effect, the selection and layout of residential air conditioning and refrigeration systems. *Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.*

→ **AIR 235 | 3 credits**  
**Heat Pumps**  
Studies theory and operation of reverse cycle refrigeration including supplementary heat as applied to heat pump systems, including service, installation and maintenance. *Prerequisites: AIR 112 and AIR 122. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.*

→ **AIR 238 | 3 credits**  
**Advanced Troubleshooting and Service**  
Introduces methodology for residential audits covering heat flow analysis, construction methods and materials. Discusses effects of life styles on energy consumption, conservation and practices, renewable energy sources, calculating costs and savings, interviewing and education techniques. Introduces commercial and industrial energy audits, methodology for the performance of audits covering heat flow analysis, construction methods and materials. *Part I of II. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.*

→ **AIR 240 | 3 credits**  
**Direct Digital Controls (DDC) I**  
Introduces methodology for commercial and industrial energy audits, methodology for the performance of audits covering heat flow analysis, construction methods and materials. *Part II of II. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.*

→ **AIR 241 | 3 credits**  
**Direct Digital Controls (DDC) II**  
Introduces methodology for commercial and industrial energy audits, methodology for the performance of audits covering heat flow analysis, construction methods and materials. *Part II of II. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.*

→ **AIR 240 | 3 credits**  
**Direct Digital Controls (DDC) I**  
Introduces methodology for residential audits covering heat flow analysis, construction methods and materials. Discusses effects of life styles on energy consumption, conservation and practices, renewable energy sources, calculating costs and savings, interviewing and education techniques. *Part I of II. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.*

→ **AIR 241 | 3 credits**  
**Direct Digital Controls (DDC) II**  
Introduces methodology for residential audits covering heat flow analysis, construction methods and materials. Discusses effects of life styles on energy consumption, conservation and practices, renewable energy sources, calculating costs and savings, interviewing and education techniques. *Part II of II. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.*
### AMERICAN SIGN LANGUAGE

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ASL 101-102</td>
<td>3 credits each</td>
<td>American Sign Language I-II</td>
<td>Introduces the fundamentals of American Sign Language (ASL) used by the Deaf Community, including basic vocabulary, syntax, fingerspelling, and grammatical non-manual signals. Focuses on communicative competence. Develops gestural skills as a foundation for ASL enhancement. Introduces cultural knowledge and increases understanding of the Deaf Community. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>ASL 115</td>
<td>2 credits</td>
<td>Fingerspelling and Number Use in ASL</td>
<td>Provides intensive practice in comprehension and production of finger spelled words and numbers with emphasis on clarity and accuracy. Focuses on lexicalized fingerspelling and numeral incorporation as used by native users of American Sign Language. Prerequisite: ASL 101 or instructor permission. Lecture 2 hours per week.</td>
</tr>
<tr>
<td>ASL 125</td>
<td>3 credits</td>
<td>History &amp; Culture of the Deaf Community I</td>
<td>Presents an overview of various aspects of Deaf Culture, including educational and legal issues. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>ASL 150</td>
<td>2 credits</td>
<td>Working with Deaf and Hard-of-Hearing People</td>
<td>Explores career options for serving Deaf/hard-of-hearing people and/or for using American Sign Language skills in a career. Examines interests, skills, and educational assessments. Investigates job market viability via the internet and professional periodicals. Develops opportunities for students to network with professionals in the field of deafness. Lecture 2 hours per week.</td>
</tr>
<tr>
<td>ASL 201-202</td>
<td>3 credits each</td>
<td>American Sign Language III-IV</td>
<td>Develops vocabulary, conversational competence, and grammatical knowledge with a total immersion approach. Introduces increasingly complex grammatical aspects including those unique to ASL. Discusses culture and literature. Contact with the Deaf Community is encouraged to enhance linguistic and cultural knowledge. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>ASL 220</td>
<td>3 credits</td>
<td>Comparative Linguistics: ASL &amp; English</td>
<td>Describes spoken English and ASL (American Sign Language) on five levels: phonological, morphological, lexical, syntactic, and discourse. Compares and contrasts the two languages on all five levels using real-world examples. Documents similarities between signed languages and spoken languages in general. Describes the major linguistic components and processes of English and ASL. Introduces basic theories regarding ASL structure. Emphasizes ASL’s status as a natural language by comparing and contrasting similarities and unique differences between the two languages. Prerequisite: ASL 201. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>ASL 261-262</td>
<td>3 credits each</td>
<td>American Sign Language V-VI</td>
<td>Develops advanced American Sign Language comprehension and production skills. Emphasizes advanced linguistic aspects of ASL. Presents ASL literary forms. Encourages contact with the Deaf Community. Prerequisite: ASL 202 or Qualifying Placement Test score into ASL 261. Lecture 3 hours per week.</td>
</tr>
</tbody>
</table>

### ARCHITECTURE

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>ARC 100</td>
<td>3 credits</td>
<td>Introduction to Architecture</td>
<td>Outlines history and impact of architecture. Emphasizes dynamics and social aspects of architecture and society; focuses on 19th and 20th century architectural forms. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>ARC 121-122</td>
<td>3 credits each</td>
<td>Architectural Drafting I-II</td>
<td>Introduces techniques of architectural drafting, including lettering, dimensioning, and symbols. Requires production of plans, sections, and elevations of a simple building. Studies use of common reference material and the organization of architectural working drawings. Requires development of a limited set of working drawings, including a site plan, related details, and pictorial drawings. Prerequisite for ARC 122: ARC 121. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.</td>
</tr>
</tbody>
</table>
→ **ARC 133 | 3 credits**  
Construction Methodology and Procedures I  
Studies materials used in construction of buildings, covering foundations to structural framing systems. Includes appropriate use of materials for various construction types. Includes specification of materials and installation procedures, types of specifications and writing procedures, bidding procedures, and contract documents. **Lecture 3 hours per week.**

→ **ARC 220 | 3 credits**  
Introduction to Landscape Architecture and Site Planning  
Introduces the basics of landscape design and development concepts through architectural construction and plantings. Shows relationship between design and environment, including objectives of design elements, materials, and facilities. **Lecture 3 hours per week.**

→ **ARC 221 | 3 credits**  
Architectural CAD Applications Software I  
Teaches the principles and techniques of architectural drawing practices through the use of architecture specific CAD software. Utilizes the commands and features of the software to generate drawings that emphasize architectural design and structural systems. **Prerequisites: ARC 121 and CAD 201. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **ARC 222 | 3 credits**  
Architectural CAD Applications Software II  
Uses advanced features of architectural CAD software to teach students to develop working drawings and details that adhere to the practices and techniques of architectural drawing principles. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **ARC 231 | 4 credits**  
Advanced Architectural Design, and Graphics I  
Provides fundamental knowledge of principles and techniques of architectural drawing procedures. Familiarizes student with design process. Provides a better understanding of the relation between architectural design and structural systems. **Prerequisite: ARC 122 or equivalent. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **ARC 246 | 4 credits**  
Materials and Methods of Construction  
Introduces the characteristics of building materials and the methods of construction in which these materials are used in the erection of structures. Introduces the physical properties of steel, concrete, timber, glass, and related materials as well as methods used in testing materials. All sixteen CSI divisions are discussed. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ARC 258 | 3 credits**  
Building Codes, Contract Documents and Professional Office Practices  
Covers professional role of the architectural technician with regard to the construction industry. Includes building codes and their effect on specifications and drawings. Teaches purpose and writing of specifications with their legal and practical application to working drawings. Analyzes contract documents for client-architect-contractor responsibilities and duties. **Lecture 3 hours per week.**

→ **ARTS**

→ **ART 101-102 | 3 credits each**  
History and Appreciation of Art I-II  
Presents the history and interpretation of architecture, sculpture, and painting. Begins with prehistoric art and follows the development of western civilization to the present. **Lecture 3 hours per week.**

→ **ART 114 | 3 credits**  
General Art  
Introduces art to the student without previous training. Provides studio exercises in drawing, painting, and two- and three-dimensional design. **Lecture 2 hours. Studio instruction 3 hours. Total 5 hours per week.**

→ **ART 121-122 | 3 credits each**  
Drawing I-II  
Develops basic drawing skills and understanding of visual language through studio instruction/lecture. Introduces concepts such as proportion, space, perspective, tone and composition as applied to still life, landscape and the figure. Uses drawing media such as pencil, charcoal, ink wash and color media. Includes field trips and gallery assignments as appropriate. **Prerequisites for ART 122: ART 121 and ART 131. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.**
→ ART 131 | 3 credits
  Fundamental of Design I
  Explores the concepts of two- and three-dimensional design and color. May include field trips as required. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

→ ART 134 | 3 credits
  Three Dimensional Design
  Explores the concepts of three dimensional design applicable to all fields of Visual Art. Covers tools and techniques. Uses computers as appropriate for research. Prerequisites: ART 121 and ART 131. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

→ ART 141 | 4 credits
  Typography I
  Studies the history of letter forms and typefaces and examines their uses in contemporary communications media. Emphasizes applications to specific design problems. Includes identification and specification of type and uses current technologies for copy fitting and hands-on typesetting problems. Prerequisites: ART 131 and ART 283. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

→ ART 183 | 3 credits
  Introduction to Art Therapy
  Introduces the history of art therapy, contemporary approaches, and various settings in which art therapy may occur. Provides instruction in the use of art materials in therapy, dynamics of the creative process and psychological theory. Reviews educational steps leading to a successful career in art therapy. Lecture 3 hours per week.

→ ART 201-202 | 3 credits each
  History of Art I-II
  Studies the historical context of art of the ancient, medieval, Renaissance and modern worlds. Includes research project. Lecture 3 hours per week.

→ ART 203 | 4 credits
  Animation I
  Introduces the student to the basic techniques of animation, both traditional and computer generated. Teaches theoretical elements of the aesthetics of sequential imagery. Provides practical experience in animation. Exposes students to a variety of animation techniques. Prerequisite: ART 283. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

→ ART 208 | 4 credits
  Video Techniques
  Addresses the fundamentals of video technology and nonlinear video editing. Focuses on the aesthetics of time-coded editing using current industry software. Teaches a student to shoot and capture video and record and edit sound, and combine artwork, animation, video, and sound in the creation of professional-quality original video projects. Prerequisite: ART 283. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

→ ART 209 | 3 credits
  Creative Concepts and Copywriting
  Focuses on the generation of creative verbal/visual concepts and the techniques of effective written communication necessary for success in the graphic design industry. Lecture 3 hours per week.

→ ART 221-222 | 3 credits each
  Drawing III-IV
  Introduces advanced concepts and techniques of drawing as applied to the figure, still life and landscape. Gives additional instruction in composition, modeling, space and perspective. Encourages individual approaches to drawing. Prerequisite for ART 221: ART 122. Prerequisite for ART 222: ART 221. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

→ ART 231 | 3 credits
  Sculpture I
  Introduces sculptural concepts and methods of production in traditional and contemporary media. Includes clay, plaster, wood, stone, metal, plastics and terra cotta. May include field trips. Prerequisite: ART 131. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

→ ART 241-242 | 3 credits each
  Painting I-II
  Introduces abstract and representational painting in acrylic and/or oil with emphasis on color composition and value. Prerequisite: ART 122 or divisional approval. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

→ ART 243-244 | 3 credits each
  Watercolor I-II
  Presents abstract and representational painting in watercolor with emphasis on design, color, composition, technique and value. Prerequisite: ART 131 or divisional approval. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.
→ ART 245 | 3 credits  
Portrait Painting  
Explores portrait painting as representational and abstract art. Emphasizes analytical study of the head using a variety of mediums. **Prerequisites: ART 241 and ART 121. Lecture 2 hours. Studio instruction 3 hours. Total 5 hours per week.**

→ ART 247 | 3 credits  
Painting Technique for Illustrators  
Introduces materials and techniques used by the illustrator. Includes water-soluble paints (watercolor, acrylic, gouache), oil-based paints, and mixed media. **Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.**

→ ART 250 | 3 credits  
History of Design  
Surveys the development of graphic design and illustration with emphasis on the 19th and 20th centuries. Analyzes the work of outstanding designers and illustrators. **Prerequisite: Placement into ENG 111. Lecture 3 hours per week.**

→ ART 251-252 | 3 credits each  
Communication Design I-II  
Studies the principles of visual communications as applied to advertising in newspapers, magazines, direct mail advertising, house organs, etc. Analyzes the influence of contemporary art on design. **Prerequisites for ART 251: ART 131 and ART 141. Prerequisites for ART 252: ART 131 and ART 251. Lecture 2 hours. Studio instruction 3 hours. Total 5 hours per week.**

→ ART 260 | 3 credits  
Pastel Landscape  
Introduces students to the urban and rural landscape using the medium of soft pastels. Emphasizes the concepts of proportion, space, perspective, tone and composition as applied to the landscape. Provides experience in plein air at various locations when weather permits. **Prerequisite: ART 121. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.**

→ ART 263 | 4 credits  
Interactive Design I  
Focuses on conceptualization and problem solving for interactive design. Instructs students in techniques specific to web, multimedia for the web and other interactive design projects using current technology and standards. Interactive functionality and usability are covered. Part I of II. **Prerequisites: ART 121, ART 131, ART 141 and ART 283. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.**

→ ART 264 | 4 credits  
Interactive Design II  
Builds on the studies completed in Interactive Design I. Focuses on conceptualization and problem solving for interactive design. Instructs students in intermediate techniques specific to web, multimedia for the web and other interactive design projects using current technology and standards. Includes interactive documents and experiences. Part II of II. **Prerequisites: ART 121, ART 131, ART 141, and ART 263. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.**

→ ART 270 | 3 credits  
Motion Graphics I  
Introduces fundamental concepts for motion graphics, including graphics and promos for television networks and film titles and logos for advertising. Focuses on design presentation and development, screen composition, graphic transitions and content. **Prerequisites: ART 131 and ART 283. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.**

→ ART 271 | 3 credits  
Printmaking I  
Introduces the student to the full range of printmaking techniques. Includes woodcut, silkscreen, etching, and lithography. Provides historical perspective on printmaking. **Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.**

→ ART 280 | 3 credits  
Graphic Design for Studio Arts  
Introduces digital tools, software, and techniques used by visual artists and design professionals to create day-to-day business forms, documents and self-promotional material. Explores the fundamental principles of layout and design that govern the use of image, type and color. Presents professional standards and practices used for organizing, archiving, printing, and presenting their work. **Prerequisites: ART 131 and PHT 101. Lecture 2 hours. Studio instruction 3 hours. Total 5 hours per week.**

→ ART 283-284 | 4 credits each  
Computer Graphics I-II  
Utilizes microcomputers and software to produce computer graphics. Employs techniques learned to solve studio projects which reinforce instruction and are appropriate for portfolio use. **Prerequisites for ART 284: ART 131 and ART 283. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.**
→ ART 286 | 3 credits
Communication Arts Workshop
Requires special project and/or research focusing on career opportunities. Teaches resume and portfolio preparation and interview techniques. May include internship with a professional design firm. Recommended for final semester Graphic Design program students. Prerequisite: Instructor permission. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

→ ART 287 | 3 credits
Portfolio and Resume Preparation
Focuses on portfolio preparation, resume writing, and job interviewing for students. Recommended for final semester Studio Arts program students. Prerequisite: Instructor permission. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

→ AUTO BODY

→ AUB 116 | 4 credits
Auto Body Repair
Teaches collision straightening procedures and use of equipment, planning repair procedures, disassembly techniques, body fastening systems, glass removal and replacement and panel repair and alignment. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ AUB 119 | 4 credits
Automotive Painting
Teaches theory and application of painting and the use of painting equipment and materials including paints, thinners, primers, rubbing compounds and cleaners. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ AUB 127 | 3 credits
Introduction to Collision Repair Technology
Introduces shop practices for auto body laboratory and shop safety, identification and use of hand tools, general power equipment and maintenance of auto body shop. Explains basic operation procedures, careers, terminology, estimating, and cycle time principles. Presents Occupational Safety and Health Act (OSHA) standards and Environmental Protection Agency (EPA) regulations pertaining to the collision repair field. Student will complete the Inter Industry Conference on Auto Collision Repair (I-CAR) modules related to the major course topics. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ AUB 130 | 3 credits
Automotive Customizing
Demonstrates stereo installation, custom wheels, headliners, upholstery, lighting, pin stripping, carpet, window tinting and other systems modified with aftermarket parts. Introduces electrical system modifications and upgrades. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ AUB 210 | 3 credits
Restoration and Automotive Customizing
Provides hands-on instruction for automotive restoration, and techniques for disassembly, restoration and reassembly processes. Explains proper use of vehicle computer programs for modification of data and design. Provides instruction for the installation, operation, and function of custom automotive components. Provides hands-on procedures for the assembly and fabrication of custom parts. Prerequisite: AUT 101 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ AUTOMOTIVE TECHNOLOGY

→ AUT 101 | 3 credits
Introduction to Automotive Systems
Introduces fundamental systems of the automobile: the engine fuel, exhaust, electric, ignition, lubrication, cooling, transmission, steering, brake and suspension systems. Teaches theory and function of each system. Demonstrates operation. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ AUT 149 | 5 credits
Basic Automotive Electrical Diagnostics
Introduces basic automotive electrical concepts, including theory and practical application. Provides instruction on using circuit wiring diagrams to accurately diagnose, troubleshoot, and repair simple electric circuits. Covers basic electrical principles, electrical terminology, and how to use electrical testing equipment. This course provides preparation for the Automotive Service Excellence (ASE) A6 Electrical/Electronic Systems ASE Certification examination. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

→ AUT 151 | 5 credits
Automotive Braking Systems Diagnostics
Introduces basic and advanced automotive braking system concepts, including theory and practical application. Provides instruction on Antilock Braking Systems, base
brake systems, and Virginia State Inspection practices. Covers basic mechanical brake systems, hydraulics, precision measuring instruments, and how to use diagnostic test equipment. Provides preparation for the Automotive Service Excellence (ASE) A5 Brakes ASE Certification examination. **Prerequisite:** AUT 149. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **AUT 152 | 5 credits**  
**Automotive Engine Diagnostics**  
Introduces basic and advanced internal combustion engine concepts, including theory and practical application. Covers cooling systems, lubrication, valve train, block assembly, and general engine diagnosis. Provides preparation for the Automotive Service Excellence (ASE) A1 Engine Repair ASE Certification examination. **Prerequisite:** AUT 149. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **AUT 153 | 5 credits**  
**Automotive Steering and Suspension Systems Diagnostics**  
Introduces basic and advanced automotive steering and suspension system concepts, including theory and practical application. Covers steering systems, suspension systems, tires and wheels, electronic suspension, power assisted steering, and wheel alignments. Provides preparation for the Automotive Service Excellence (ASE) A4 Steering and Suspension ASE Certification examination. **Prerequisite:** AUT 149. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **AUT 155 | 5 credits**  
**Basic Automotive Engine Performance Diagnostics**  
Introduces basic engine performance concepts, including theory and practical application. Covers vehicle communications, scan-tool diagnostics, basic engine mechanical tests, and diagnosing and repairing vehicle drivability issues. Provides preparation for the Automotive Service Excellence (ASE) A8 Engine Performance ASE Certification examination. **Prerequisite:** AUT 149. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **AUT 156 | 2 credits**  
**Small Gasoline Engines**  
Studies small gasoline engine operating principles, construction, design, variety, and their many purposes. Gives instruction on two-cycle and four-cycle small gas engines, their construction, design, fuel system, ignition system, and lubricating systems. Demonstrates disassembly, reconditioning, overhaul and reassembly in the lab. **Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.**

→ **AUT 178 | 4 credits**  
**Automotive Final Drive and Manual Transmission Systems**  
Presents the operation, design, construction and repair of manual transmissions and final drive systems, for both front and rear drive vehicles, including clutches, synchronizers, torque multiplication/gear reduction, along with differentials, transmission/transaxles, drive axles, U-joints, CV joints, 4-wheel drive and all-wheel drive systems. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **AUT 236 | 4 credits**  
**Automotive Climate Control**  
Introduces principles of refrigeration, air conditioning controls, and adjustment and general servicing of automotive air conditioning systems. **Prerequisite:** AUT 149. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **AUT 249 | 5 credits**  
**Advanced Automotive Electrical Diagnostics**  
Introduces advanced automotive electrical concepts, including theory and practical application. It provides instruction on diagnosing and repairing computer controlled modules, circuits, and systems. Covers advanced electronic principles, definitions of electronic terminology, computer networking, and how to use electronic test equipment. Provides preparation for the Automotive Service Excellence (ASE) A6 Electrical/Electronic Systems ASE Certification examination. **Prerequisite:** AUT 149. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **AUT 250 | 3 credits**  
**Chassis Dynamometer Testing and Tuning**  
Teaches the dynamic application of engine management by using a chassis dynamometer to measure and record performance gains and losses during component and software alterations. Provides instruction on proper use of a chassis dynamometer. Introduces different combinations of engine performance evaluation methods in a climate-controlled, 1200HP-capable, dynamometer cell. Teaches how to reduce chances of major engine damage through proper dynamometer tuning techniques. **Prerequisites:** AUT 166 and AUT 167 or equivalent. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **AUT 251 | 4 credits**  
**Automatic Transmissions**  
Studies several types of automatic transmissions, torque converters, and their principles of operation. Includes adjustment, maintenance, and rebuilding. **Prerequisite:** AUT 149. **Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.**
→ AUT 255 | 5 credits  
**Advanced Automotive Engine Performance Diagnostics**  
Introduces advanced engine performance concepts, including theory and practical application. Covers vehicle communications, scan-tool diagnostics, advanced engine mechanical tests, and diagnosing and repairing vehicle drivability issues. Provides preparation for the Automotive Service Excellence (ASE) A8 Engine Performance ASE Certification examination. **Prerequisite:** AUT 155. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ AUT 260 | 2 credits  
**Advanced Small Gasoline Engines**  
Presents advanced theory of operation for small gasoline engines, combustion principles, construction, design, variety, and their many purposes. Explains two-cycle and four-cycle small gas engine operation, ignition systems, various construction principles, functional design and usage, fuel systems and lubricating systems. Provides hands-on instruction in disassembly, reconditioning, overhaul and reassembly procedures in the lab. **Prerequisite:** AUT 156 or equivalent. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ BIO 100 | 3 credits  
**Basic Human Biology**  
Integrates anatomy and physiology of cells, tissues, organs, and selected human systems. **Lecture 3 hours per week.**

→ BIO 101 | 4 credits  
**General Biology I**  
Focuses on foundations in cellular structure, metabolism, and genetics in an evolutionary context. Explores the core concepts of evolution; structure and function; information flow, storage and exchange; pathways and transformations of energy and matter; and systems biology. Emphasizes process of science, interdisciplinary approach, and relevance of biology to society. Part I of a two-course sequence. **Prerequisites:** Placement into ENG 111 and MTE 3 or Qualifying Placement Test score. **Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.**

→ BIO 102 | 4 credits  
**General Biology II**  
Focuses on diversity of life, anatomy and physiology of organisms, and ecosystem organization and processes in an evolutionary context. Explores the core concepts of evolution; structure and function; information flow, storage and exchange; pathways and transformations of energy and matter; and systems biology. Emphasizes process of science, interdisciplinary approach, and relevance of biology to society. Part II of a two-course sequence. **Prerequisite:** BIO 101. **Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.**

→ BIO 141 | 4 credits  
**Human Anatomy and Physiology I**  
Integrates anatomy and physiology of cells, tissues, organs, and systems of the human body. Integrates concepts of chemistry, physics, and pathology. Part I of II. **Prerequisite:** NAS 2 or acceptable NAS 2 Challenge Exam score. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ BIO 142 | 4 credits  
**Human Anatomy and Physiology II**  
Integrates anatomy and physiology of cells, tissues, organs, and systems of the human body. Integrates concepts of chemistry, physics, and pathology. Part II of II. **Prerequisite:** BIO 141. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ BIO 150 | 4 credits  
**Introductory Microbiology**  
Studies the general characteristics of microorganisms. Emphasizes their relationships to individual and community health. **Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.**

→ BLD 111 | 3 credits  
**Blueprint Reading and the Building Code**  
Introduces reading and interpreting various kinds of blueprints and working drawings with reference to local, state, and national building codes. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**
→ BLD 117 | 3 credits  
**Contract Documents and Construction Law**  
Covers contractual relationships, contract forms and documents, managing general conditions, good documentation processes, differing site conditions, time impacts, and negotiation of resolutions. **Lecture 3 hours per week.**

→ BLD 215 | 2 credits  
**OSHA 30 Construction Safety**  
Covers all topics included in the OSHA 30-hour course. **Lecture 2 hours per week.**

→ BLD 247 | 3 credits  
**Construction Planning and Scheduling**  
Introduces principles of planning and scheduling of a construction project. Includes sequence of events and processes on a construction site. Studies scheduling techniques including the critical path method. **Lecture 3 hours per week.**

→ BUS 100 | 3 credits  
**Introduction to Business**  
Presents a broad introduction to the functioning of business enterprise within the U.S. economic framework. Introduces economic systems, essential elements of business organization, production, human resource management, marketing, finance, and risk management. Develops business vocabulary. **Lecture 3 hours per week.**

→ BUS 111 | 3 credits  
**Principles of Supervision I**  
Teaches the fundamentals of supervision, including the primary responsibilities of the supervisor. Introduces factors relating to the work of supervisor and subordinates. Covers aspects of leadership, job management, work improvement, training and orientation, performance evaluation, and effective employee/supervisor relationships. **Lecture 3 hours per week.**

→ BUS 116 | 3 credits  
**Entrepreneurship**  
Presents the various steps considered necessary when going into business. Includes areas such as product-service analysis, market research evaluation, setting up books, ways to finance startup, operations of the business, development of business plans, buyouts versus starting from scratch, and franchising. Uses problems and cases to demonstrate implementation of these techniques. **Lecture 3 hours per week.**

→ BUS 117 | 3 credits  
**Leadership Development**  
Covers interpersonal relations in hierarchical structures. Examines the dynamics of teamwork, motivation, handling change and conflict and how to achieve positive results through others. **Lecture 3 hours per week.**

→ BUS 125 | 3 credits  
**Applied Business Mathematics**  
Applies mathematical operations to business processes and problems such as wages and payroll, sales and property taxes, checkbook records and bank reconciliation, depreciation, overhead, distribution of profit and loss in partnerships, distribution of corporate dividends, commercial discounts, markup, markdown, simple interest, present values, bank discount notes, multiple payment plans, compound interest annuities, sinking funds, and amortization. **Prerequisite: MTH 121 or higher. Lecture 3 hours per week.**

→ BUS 130 | 3 credits  
**Maritime Logistics Afloat**  
Examines the technician and mid-level management responsibilities required to perform all tasks relative to maritime logistics operations afloat using current occupational standards for Logisticians. Discusses the three major areas in the Naval Supply System of Inventory, logistics, and financial management. **Lecture 3 hours per week.**

→ BUS 131 | 3 credits  
**Maritime Logistics Ashore**  
Examines the technician and mid-level management responsibilities required to perform all tasks relative to ashore maritime logistics. Focuses on current occupational standards for Logisticians. Discusses the three major topic areas in the Naval Supply System of Inventory, logistics, and financial management. **Lecture 3 hours per week.**
BUS 156 | 3 credits
Introduction to Operating Management
Introduces quantitative methods to control cost. Analyzes cost concepts and behavior from a managerial viewpoint. Applies quantitative tools such as PERT, linear programming, transportation models, and queuing theory. Encourages use of microcomputer. Lecture 3 hour per week.

BUS 160 | 1 credit
Legal Aspects of Small Business Operations
Covers the functional areas of business law, specifically as it applies to small business. Provides the students with a working knowledge of business contracts, agency relationships, and product liability. Provides a knowledge base for small business owners to overcome problems that are individually within their abilities. Covers selection of professional assistance for problems of a more serious nature. Lecture 1 hour per week.

BUS 165 | 3 credits
Small Business Management
Identifies management concerns unique to small businesses. Introduces the requirements necessary to initiate a small business, and identifies the elements comprising a business plan. Presents information establishing financial and administrative controls, developing a marketing strategy, managing business operations, and the legal and government relationships specific to small businesses. Lecture 3 hours per week.

BUS 200 | 3 credits
Principles of Management
Teaches management and the management functions of planning, organizing, leading and controlling. Focuses on application of management principles to realistic situations managers encounter as they attempt to achieve organizational objectives. Prerequisite: BUS 100. Lecture 3 hours per week.

BUS 201 | 3 credits
Organizational Behavior
Presents a behaviorally oriented course combining the functions of management with the psychology of leading and managing people. Focuses on the effective use of human resources through understanding human motivation and behavior patterns, conflict management and resolution, group functioning and process, the psychology of decision-making, and the importance of recognizing and managing change. Lecture 3 hours per week.

BUS 202 | 3 credits
Applied Management Principles
Focuses on management practices and issues. May use case studies and/or management decision models to analyze problems in developing and implementing a business strategy while creating and maintaining competitive advantage. Prerequisite: BUS 200. Lecture 3 hours per week.

BUS 204 | 3 credits
Project Management
Provides students with knowledge of essential skills and techniques necessary to lead or participate in projects assigned to managerial personnel. Covers time and task scheduling, resource management, problem solving strategies and other areas related to managing a project. Lecture 3 hours per week.

BUS 205 | 3 credits
Human Resource Management
Introduces employment, selection, and placement of personnel, forecasting, job analysis, job descriptions, training methods and programs, employee evaluation systems, compensation, benefits, and labor relations. Lecture 3 hours per week.

BUS 208 | 3 credits
Quality and Productivity Management
Focuses on the key quality improvement concepts regarding products and services, customers and suppliers, and systems and processes that make quality a part of the work life of an organization. Emphasizes the role of teams and a variety of quality improvement tools, charts, matrices, and diagrams. Details workflow process analysis and redesign in the healthcare industry, with an emphasis on human factors and usability. Lecture 3 hours per week.

BUS 215 | 3 credits
Purchasing and Materials Management
Teaches the principles of effective purchasing and management of materials and equipment. Includes determination of requirements, source selection, pricing, value analysis, contracting, inventory management, and equipment requisition decisions. Lecture 3 hours per week.

BUS 216 | 3 credits
Probability and Statistics for Business and Economics
Introduces methods of probability assessment and statistical inference. Includes data collection and presentation; descriptive statistics; basic probability concepts; discrete and continuous probability distributions; decision
BUS 220 | 3 credits  
Introduction to Business Statistics  
Introduces statistics as a tool in decision-making. Emphasizes ability to collect, present, and analyze data. Employs measures of central tendency and dispersion, statistical inference, index numbers, probability theory, and time-series analysis. Prerequisite: MTH 121 or higher. Lecture 3 hours per week.

BUS 223 | 3 credits  
Distribution and Transportation  
Examines the background and history of transportation, emphasizing the fundamental role and importance the industry plays in companies, society, and the environment in which transportation service is provided. Provides an overview of carrier operations, management, technology, and strategies including transportation regulations and public policy. Lecture 3 hours per week.

BUS 234 | 3 credits  
Supply Chain Management  
Examines the process of planning, organizing, and controlling the flow of materials and services from supplier to end users/customers. Focuses on coordinating supply management, operations and integrated logistics into a seamless pipeline to maintain a continual flow of products and services. Lecture 3 hours per week.

BUS 236 | 3 credits  
Communication in Management  
Introduces the functions of communication in management with emphasis on gathering, organizing, and transmitting facts and ideas. Teaches the basic techniques of effective oral and written communication. Lecture 3 hours per week.

BUS 241 | 3 credits  
Business Law I  
Develops a basic understanding of the U.S. business legal environment. Introduces property and contract law, agency and partnership liability, and government regulatory law. Students will be able to apply these legal principles to landlord/tenant disputes, consumer rights issues, employment relationships, and other business transactions. Lecture 3 hours per week.

BUS 242 | 3 credits  
Business Law II  
Focuses on business organization and dissolution, bankruptcy and Uniform Commercial Code. Introduces international law and the emerging fields of E-Commerce and Internet Law. Prerequisite: BUS 241. Lecture 3 hours per week.

BUS 255 | 3 credits  
Inventory and Warehouse Management  
Emphasizes the relationships of inventory and warehouse management to customer service and profitability of the wholesale distributor. Focuses on the role of computerized systems and resulting information for effective management of inventory and the warehouse under various conditions. Lecture 3 hours per week.

BUS 260 | 2 credits  
Planning for Small Business  
Provides knowledge of the development of a business plan, which can be used to acquire capital and serve as a management guide. Combines knowledge that has been acquired in the areas of planning, management, and finance using pro forma statements and marketing. Covers Internet searching techniques. Recommended as a capstone course. Lecture 2 hours per week.

BUS 265 | 3 credits  
Ethical Issues in Management  
Examines the legal, ethical, and social responsibilities of management. May use cases to develop the ability to think and act responsibly. Lecture 3 hours per week.

BUS 266 | 3 credits  
Production and Operations Management  
Examines the process by which both goods and service-producing businesses, many not-for-profit institutions, and governmental agencies transform resources into an end product to meet the demands of customers or clients. Includes a survey of some of the quantitative methods involved in the process. Lecture 3 hours per week.

BUS 280 | 3 credits  
Introduction to International Business  
Studies the problems, challenges, and opportunities, which arise when business operations or organizations transcend national boundaries. Examines the functions of international business in the economy, international and transnational marketing, production, and financial operations. Lecture 3 hours per week.
CHEMISTRY

→ CHM 1 | 4 credits
Chemistry
Presents basic inorganic and organic principles to students with little or no chemistry background. Can be taken in subsequent semesters as necessary until course objectives are completed. Lecture 4 hours per week.

→ CHM 110 | 3 credits
Survey of Chemistry
Introduces the basic concepts of general, organic, and biochemistry with emphasis on their applications to other disciplines. No previous chemistry background required. Lecture 3 hours per week.

→ CHM 111-112 | 4 credits each
College Chemistry I-II
Explores the fundamental laws, theories, and mathematical concepts of chemistry. Designed primarily for science and engineering majors. Requires a strong background in mathematics. Prerequisite for CHM 112: CHM 111. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ CHM 121-122 | 4 credits each
Health Science Chemistry I-II
Introduces the health science student to concepts of inorganic, organic, and biological chemistry as applicable to the allied health profession. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ CHM 241 | 3 credits
Organic Chemistry I
Introduces fundamental chemistry of carbon compounds, including structures, physical properties, syntheses, and typical reactions. Emphasizes reaction mechanisms. Part I of II. Prerequisite: CHM 112. Lecture 3 hours per week.

→ CHM 242 | 3 credits
Organic Chemistry II
Introduces fundamental chemistry of carbon compounds, including structures, physical properties, syntheses, and typical reactions. Emphasizes reaction mechanisms. Part II of II. Prerequisite: CHM 241. Lecture 3 hours per week.

→ CHM 245 | 2 credits
Organic Chemistry Laboratory I
Includes qualitative organic analysis. Part I of II. Prerequisite or co-requisite: CHM 241. Laboratory 6 hours per week.

→ CHM 246 | 2 credits
Organic Chemistry Laboratory II
Includes qualitative organic analysis. Part II of II. Prerequisite: CHM 245. Prerequisite or co-requisite: CHM 242. Laboratory 6 hours per week.

CHILDHOOD DEVELOPMENT

→ CHD 118 | 3 credits
Language Arts for Young Children
Emphasizes the early development of children’s language and literacy skills. Presents techniques and methods for supporting all aspects of early literacy. Surveys children’s literature, and examines elements of promoting oral literacy, print awareness, phonological awareness, alphabetic principle, quality storytelling and story reading. Addresses strategies for intervention and support for exceptional children and English Language Learners. Prerequisite: placement into ENF 1. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ CHD 119 | 3 credits
Introduction to Reading Methods
Focuses on promoting language and literacy skills as the foundation for emergent reading. Emphasizes phonetic awareness and alphabetic principles, print awareness and concepts, comprehension and early reading and writing. Addresses strategies for intervention and support for exceptional children and English Language Learners. Prerequisite: Placement into ENG 111. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ CHD 120 | 3 credits
Introduction to Early Childhood Education
Introduces early childhood development through activities and experiences in early childhood, pre-kindergarten, kindergarten, and primary programs. Investigates classroom organization and procedures, and use of classroom time and materials, approaches to education for young children, professionalism, and curricular procedures. Prerequisite: Placement into ENF 1. Lecture 3 hours per week.
→ **CHD 145 | 3 credits**  
**Teaching Art, Music, and Movement to Children**  
Focuses on children’s exploration, play, and creative expression in the areas of art, music, and movement. Emphasis will be on developing strategies for using various open-ended media representing a range of approaches in creative thinking. Addresses strategies for intervention and support for exceptional children and English Language Learners. **Prerequisite:** Placement into ENF 1. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ **CHD 146 | 3 credits**  
**Math, Science, and Social Studies for Children**  
Provides experiences in content, methods, and materials for the development of math, science, and social studies skills in children. Emphasis will be on developing strategies for using various resources to facilitate children’s construction of knowledge. Addresses strategies for intervention and support for children with special needs and English Language Learners. **Prerequisite:** Placement into ENF 1. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ **CHD 164 | 3 credits**  
**Working with Infants and Toddlers in Inclusive Settings**  
Examines developmental and behavioral principles and practices and how these provide the most developmentally suitable curriculum and learning environment for very young children. Includes working with very young children with typical development, as well as those who are gifted, or have developmental delays or disabilities. **Lecture 3 hours per week.**

→ **CHD 165 | 3 credits**  
**Observation and Participation in Early Childhood/Primary Settings**  
Focuses on observation as the primary method for gathering information about children in early childhood settings. Emphasizes development of skills in the implementation of a range of observation techniques. May be repeated for credit. **Prerequisite:** Placement into ENF 1. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ **CHD 166 | 3 credits**  
**Infant and Toddler Programs**  
Examines child growth and development from birth to 36 months. Focuses on development in the physical, cognitive, social, emotional, and language domains. Emphasizes the importance of the environment and relationships for healthy brain development during the child’s first three years of life. Investigates regulatory standards for infant/toddler care giving. **Prerequisite:** Placement into ENF 1. Lecture 3 hours per week.

→ **CHD 167 | 3 credits**  
**CDA Theories and Applications: Resource File**  
Supports the student/CDA candidate in completing the Professional Resource File and all documentation required for the national CDA credential. **Lecture 3 hours per week.**

→ **CHD 205 | 3 credits**  
**Guiding the Behavior of Children**  
Explores the role of the early childhood educator in supporting emotional and social development of children, and in fostering a sense of community. Presents practical strategies for encouraging prosocial behavior, conflict resolution and problem solving. Emphasizes basic skills and techniques in child guidance. **Prerequisite:** Placement into ENF 1. Lecture 3 hours per week.

→ **CHD 210 | 3 credits**  
**Introduction to Exceptional Children**  
Reviews the history of and legal requirements for providing intervention and educational services for young children with special needs. Studies the characteristics of children with a diverse array of needs and developmental abilities. Explores concepts of early intervention, inclusion, guiding behavior and adapting environments to meet children’s needs. **Prerequisite:** Placement into ENF 1. Lecture 3 hours per week.

→ **CHD 215 | 3 credits**  
**Models of Early Childhood Education Programs**  
Studies and discusses the various models and theories of early childhood education programs including current trends and issues. Presents state licensing and staff requirements. **Lecture 3 hours per week.**

→ **CHD 216 | 3 credits**  
**Early Childhood Programs, School, and Social Change**  
Explores methods of developing positive, effective relations with families to enhance their developmental goals for children. Considers culture and other diverse needs, perspectives, and abilities of families and educators. Emphasizes advocacy and public policy awareness as an important role of early childhood educators. Describes risk factors and identifies community resources. **Prerequisite:** Placement into ENF 1. Lecture 3 hours per week.
→ CHD 225 | 3 credits
Curriculum Development for School-Age Child Care
Explores the creative activities, techniques, interactions, and program development that promote positive social and emotional growth in school-age children. Emphasizes positive development through everyday programming and experiences. Lecture 3 hours per week.

→ CHD 230 | 3 credits
Behavior Management for School-Age Child Care
Discusses the development of social skills that school-age children need for self-management, including self-discipline, self-esteem, and coping with stress and anger. Explores ways to effectively guide and discipline school-age children, focusing on how adults can facilitate positive pro-social and self-management skills. Lecture 3 hours per week.

→ CHD 265 | 3 credits
Advanced Observation and Participation in Early Childhood/Primary Settings
Focuses on implementation of activity planning and observation of children through participation in early childhood settings. Emphasizes responsive teaching practices and assessment of children’s development. Reviews legal and ethical implications of working with children. Prerequisite: Instructor permission. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ CHD 270 | 3 credits
Administration of Childcare Programs
Examines the skills needed for establishing and managing early childhood programs. Emphasizes professionalism and interpersonal skills, program planning, staff selection and development, creating policies, budgeting, and developing forms for record keeping. Lecture 3 hours per week.

→ CHD 298 | 1 credit
Portfolio Development
Serves, in conjunction with CHD 265, as the capstone for Early Childhood Development Associate of Applied Science degree. Focuses on the development of a portfolio to demonstrate professional competence in the field of early care and education. The resulting portfolio will be reviewed by early childhood faculty and other designated early childhood professionals. Lecture 1 hour per week.

→ CHI 101-102 | 5 credits each
Beginning Chinese I-II
Introduces understanding, speaking, reading, and writing skills; emphasizes basic Chinese sentence structure. Prerequisite for CHI 102: CHI 101 or 2 years of high school Chinese. Lecture 5 hours per week.

→ CHI 201-202 | 4 credits each
Conversational Chinese I-II
Offers intensive practice in comprehending and speaking Chinese, with emphasis on developing structure and fluency. Prerequisite for CHI 201: CHI 102 or 3 years of high school Chinese. Prerequisite for CHI 202: CHI 201 or 4 years of high school Chinese. Lecture 4 hours per week.

→ CIV 110 | 2 credits
Introduction to Civil Engineering Technology
Introduces basic skills required for a career in civil engineering technology, focusing on the roles and responsibilities of the engineering team, professional ethics, problem solving with hand calculator and computer applications. Introduces civil engineering materials and analysis, standard laboratory procedures and reporting, and engineering graphics, including instruction in Computer-Aided Drafting. Instructs students in oral presentation preparations and delivery. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ CIV 115 | 3 credits
Civil Engineering Drafting
Introduces terminology and drafting procedures related to civil engineering. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ CIV 120 | 3 credits
Masonry Technology
Introduces the ASTM standards and the methodology of concrete masonry technology emphasizing mortar mix designs, field and laboratory testing, and typical field applications. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.
→ **CIV 135 | 3 credits**  
**Construction Management and Estimating**  
Teaches the equipment and methods used in construction. Includes principles and economics of construction, planning and management, and principles of estimating primarily using highway and building project examples. **Lecture 3 hours per week.**

→ **CIV 171 | 3 credits**  
**Surveying I**  
Introduces surveying equipment, procedures and computations including adjustment of instruments, distance measurement, leveling, angle measurement, traversing, traverse adjustments, area computations and introduction to topography. **Prerequisite: Placement into MTH 163. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **CIV 172 | 3 credits**  
**Surveying II**  
Introduces surveys for transportation systems including the preparation and analysis of topographic maps, horizontal and vertical curves, earthwork and other topics related to transportation construction. **Prerequisite: CIV 171. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **CIV 200 | 3 credits**  
**Fundamentals of Building Construction**  
Introduces the various materials available for design and construction. Covers application and combination of traditional materials and recent innovations in construction systems. **Lecture 3 hours per week.**

→ **CIV 225 | 3 credits**  
**Soil Mechanics**  
Focuses on soil in its relationship to engineering construction. Includes soil composition and structure, weight-volume relationships, sampling procedures, classification systems, water in soil, stresses, strains, bearing capacity, settlement and expansion, compaction, stabilization, and introduction to foundations and retaining walls. **Co-requisite: CIV 226. Lecture 3 hours per week.**

→ **CIV 226 | 1 credit**  
**Soil Mechanics Laboratory**  
Introduces practical soil sampling; classification of unified, ASTM and ASSHTO specifications; laboratory testing of soils to predict engineering performance. **Co-requisite: CIV 225. Laboratory 2 hours per week.**

→ **CIV 228 | 2 credits**  
**Concrete Technology**  
Introduces properties of Portland cement concrete, methods of mix design and adjustment, transportation, placement and curing in accordance with ACI and PCA recommended procedures. **Co-requisite: CIV 229. Lecture 2 hours per week.**

→ **CIV 229 | 1 credit**  
**Concrete Laboratory**  
Focuses on mixing, curing, testing and quality control of concrete. **Co-requisite: CIV 228. Laboratory 2 hours per week.**

→ **CIV 230 | 3 credits**  
**Civil Construction Materials**  
Introduces the basic properties of Portland Cement concrete, soils and bituminous materials. Includes design and composition, placement, sampling and testing of concrete, soils, and asphalt cements used in civil engineering construction. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **CIV 239 | 1 credit**  
**Fluid Mechanics & Hydraulics Laboratory**  
Provides problem-solving, data analysis, and technical writing experience. Explores fluid properties, hydrostatics, fluid dynamics, closed conduit flow, open channel flow, and flow measurement. **Co-requisite: CIV 240 or instructor permission. Laboratory 2 hours. Total 2 hours per week.**

→ **CIV 240 | 3 credits**  
**Fluid Mechanics and Hydraulics**  
Introduces the principles of fluid flow and development of practical hydraulics resulting from study of fluid statics, flow of real fluid in pipes, multiple pipe lines, liquid flow in open channels, and fluid measurement techniques. **Prerequisite: MEC 131. Lecture 3 hours per week.**

→ **CIV 256 | 3 credits**  
**Global Positioning Systems for Land Surveying**  
Introduces principles of satellite-based surveying and presents Global Positioning System (GPS) as it is utilized in land surveying and the various components of the GPS technology and the techniques through which the GPS technology may be used in land surveys. Utilizes field surveys using the GPS equipment as part of the laboratory activities. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**
→ **CIV 257 | 3 credits**  
*Mapping Standards, VA Rules and Statutes, and Surveying Law*  
Presents both theory and practical mapping experience in the preparation of subdivision maps, records of surveys, topographic maps, route and rights-of-way maps. Covers the requirements of the Subdivision Map Act and the Land Surveyors Act. Presents techniques for the reduction of field survey notes and the preparation of improvement plans. Prepares students for areas of the Land Surveyors-in-Training and the State Land Surveyors examinations. **Lecture 3 hours per week.**

→ **CIV 258 | 1 credit**  
*Photogrammetry and Remote Sensing*  
Introduces principles of photogrammetry, geometry of photographs, flight planning, ground control, single and double image photogrammetry, stereoscopic plot, orthophoto, photogrammetric mapping, applications, and economic factors. Provides the student with the required background preparation for areas of the State Land Surveyors Examination and the Land Surveyors-in-Training Examination devoted to this topic. **Lecture 1 hour per week.**

→ **CIV 259 | 1 credit**  
*Virginia Coordinate Systems*  
Provides an introduction to the theory of the Virginia Coordinate System and its application to modern surveying practices; conversion of geographical coordinates, zone conversion, and transversing of the grid. Provides the student with the required background and preparation for areas of the State Land Surveyors Examination and the Land Surveyors-in-Training Examination devoted to this topic. **Lecture 1 hour per week.**

→ **CIV 280 | 3 credits**  
*Introduction to Environmental Engineering*  
Introduces the engineering elements of water and wastewater treatment, water distribution and wastewater collection systems, solid and hazardous waste, erosion control, and stormwater management. **Lecture 3 hours per week.**

→ **COMMUNICATION STUDIES AND THEATRE**

→ **CST 100 | 3 credits**  
*Principles of Public Speaking*  
Applies theory and principles of public address with emphasis on preparation and delivery. **Lecture 3 hours per week.**

→ **CST 110 | 3 credits**  
*Introduction to Communication*  
Examines the elements affecting speech communication at the individual, small group, and public communication levels with emphasis on practice of communication at each level. **Lecture 3 hours per week.**

→ **CST 111 | 3 credits**  
*Voice and Diction I*  
Enables students to improve pronunciation, articulation, and voice quality. Includes applied phonetics. **Lecture 3 hours per week.**

→ **CST 126 | 3 credits**  
*Interpersonal Communication*  
Teaches interpersonal communication skills for both daily living and the world of work. Includes perception, self-concept, self-disclosure, listening and feedback, nonverbal communication, attitudes, assertiveness, and other interpersonal skills. **Lecture 3 hours per week.**

→ **CST 130 | 3 credits**  
*Introduction to the Theatre*  
Surveys the principles of drama, the development of theatre production, and selected plays to acquaint the student with various types of theatrical presentations. **Lecture 3 hours per week.**

→ **CST 131-132 | 3 credits each**  
*Acting I-II*  
Develops personal resources and explores performance skills through such activities as theatre games, role playing, improvisation, work on basic script units, and performance of scenes. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**
→ **CST 141 | 3 credits**  
**Theatre Appreciation I**  
Aims to increase knowledge and enjoyment of theatre. Considers process, style, organization, written drama, and performed drama. **Lecture 3 hours per week.**

→ **CST 145 | 3 credits**  
**Stagecraft**  
Acquaints the student with fundamental methods, materials, and techniques of set construction for the stage. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **CST 151 | 3 credits**  
**Film Appreciation I**  
Provides students with a critical understanding of film through the discussion and viewing of motion pictures with emphasis upon the study of film history and the forms and functions of film. Students will develop skills to analyze the shared social, cultural and historical influences of films and their contexts. Part I of II. **Lecture 3 hours per week.**

→ **CST 152 | 3 credits**  
**Film Appreciation II**  
Provides students with a critical understanding of film through the discussion and viewing of motion pictures with emphasis upon the study of film history and the forms and functions of film. Students will develop skills to analyze the shared social, cultural and historical influences of films and their contexts. Part II of II. **Lecture 3 hours per week.**

→ **CST 229 | 3 credits**  
**Intercultural Communication**  
Emphasizes the influence of culture on the communication process including differences in values, message systems, and communication rules. **Lecture 3 hours per week.**

→ **CST 233 | 3 credits**  
**Rehearsal and Performance I**  
Explores various aspects of the theatre through involvement in college theatre production. Part I of II. **Variable hours per week.**

→ **CST 234 | 3 credits**  
**Rehearsal and Performance II**  
Explores various aspects of the theatre through involvement in college theatre production. Part II of II. **Variable hours per week.**

→ **CST 241 | 3 credits**  
**Introduction to Directing I**  
Introduces theory and practice of stage direction through the study of directing methods as well as the execution and discussion of directing exercises. **Prerequisites: CST 131 and CST 132 or divisional approval. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **CST 251 | 3 credits**  
**Stage Lighting and Sound**  
Provides students with a basic understanding of the principles of stage lighting and sound. Instructs students in the fundamentals of stage lighting such as: functions of lighting, qualities of light, design, basic electricity, lighting instruments and equipment, board operation, and safety. Instructs students in the functions of sound, equipment, design, and sound operation. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **CST 266 | 3 credits**  
**Outdoor Drama**  
Enables students to study production techniques through participation as actors or technicians in outdoor drama. **Prerequisite: Instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **CSC 110 | 3 credits**  
**Introduction to Computing**  
Introduces problem solving through computer applications and a programming language. Examines development of computers, social and ethical implications of computers, and properties of programming languages. Covers input, storage, data manipulation, software, and hardware. **Prerequisite: Placement into MTH 173. Lecture 3 hours per week.**

→ **CSC 201 | 4 credits**  
**Computer Science I**  
Introduces algorithm and problem solving methods. Emphasizes structured programming concepts, elementary data structures and the study and use of a high level programming language. **Prerequisite: CSC 110. Lecture 4 hours per week.**
→ **CSC 205**  |  3 credits  
**Computer Organization**  
Examines the hierarchical structure of computer architecture. Focuses on multi-level machine organization. Uses a simple assembler language to complete programming projects. Includes processors, instruction, execution, addressing techniques, data representation and digital logic. 
**Prerequisite:** CSC 110. Lecture 3 hours per week.

→ **CSC 210**  |  4 credits  
**Programming with C++**  
Includes language syntax, problem-solving techniques, top-down refinement, procedure definition, loop invariance, theory of numerical errors and debugging. Covers the syntax of the C++ language. 
**Prerequisite:** CSC 201 or EGR 125. Lecture 4 hours per week.

→ **CSC 215**  |  3 credits  
**Advanced Computer Organization**  
Examines advanced topics in Computer Science such as I/O methods, virtual memory, disk management and operating systems. 
**Prerequisite:** CSC 205. Lecture 3 hours per week.

→ **CAD 140**  |  3 credits  
**Technical Drawing**  
Enhances the principles learned that are related directly to the field of drafting and design. Gives a more in-depth exposure to detail and working drawings, dimensioning, tolerancing and conventional drafting practices. Teaches CAD modeling, may include parametric modeling. (Credit will not be awarded for both CAD 140 and DRF 140.) 
Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ **CAD 151-152**  |  3 credits each  
**Engineering Drawing Fundamentals I-II**  
Introduces technical drafting from the fundamentals through advanced drafting practices. Includes lettering, geometric construction, technical sketching, orthographic projection, sections, intersections, development, and fasteners. Teaches theory and application of dimensioning and tolerances, pictorial drawing, and preparation of drawings. 
**Prerequisite for CAD 152:** CAD 151. Lecture 1 hour. Laboratory 6 hours. Total 7 hours per week.

→ **CAD 160**  |  3 credits  
**Machine Blueprint Reading**  
Introduces interpretation of various blueprints and working drawings. Applies basic principles and techniques such as visualization of an object, orthographic projection, technical sketching and drafting terminology. Requires outside preparation. 
Lecture 3 hours per week.

→ **CAD 165**  |  3 credits  
**Architectural Blueprint Reading**  
Emphasizes reading, understanding and interpreting standard types of architectural drawings including plans, elevation, sections, and details. 
Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ **CAD 201**  |  4 credits  
**Computer-Aided Drafting and Design I**  
Teaches computer-aided drafting concepts and equipment designed to develop a general understanding of components of a typical CAD system and its operation. 
Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ **CAD 202**  |  4 credits  
**Computer-Aided Drafting and Design II**  
Teaches production drawings and advanced operations in computer-aided drafting. 
**Prerequisite:** CAD 201. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.
CAD 211 | 3 credits  
Advanced Technical Drafting I  
Teaches use of drafting equipment and applications, emphasizing knowledge and skill required for industrial drawing. Includes piping, gearing, geometric and positional tolerances and 2D/3D drawing layout. Prerequisites: CAD 152 and CAD 201. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

CAD 212 | 3 credits  
Advanced Technical Drafting II  
Teaches concepts of sheet metal fabrication including radii, fillets and tolerances, electrical and electronics symbols and drawing, and advanced design drafting techniques. Prerequisites: CAD 201 and CAD 202. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

CAD 238-239 | 3 credits each  
Computer-Aided Modeling and Rendering I-II  
Focuses on training students in the contemporary techniques of 3-D modeling, rendering, and animation on the personal computer. Introduces the principles of visualization, sometimes known as photo-realism, which enables the student to create presentation drawings for both architectural and industrial product design. Uses computer animation to produce walk-throughs that will bring the third dimension to architectural designs. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

CAD 241-242 | 3 credits each  
Parametric Solid Modeling I-II  
Focuses on teaching students the design of parts by parametric solid modeling. Topics covered will include, but not limited to, sketch profiles; geometric and dimensional constraints; 3-D features; model generation by extrusion, revolution and sweep; and the creation of 2-D drawing views that include sections, details, and auxiliary. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

CAD 280 | 3 credits  
Design Capstone Project  
Focuses on design projects developed independently and in consultation with the instructor. Topics covered, but not limited to, parametric modeling, civil, mechanical piping, architectural applications, structural, electro-mechanical, 3-D solids, exploration of application software, and the integration of CAD/CAM. Prerequisites: (ARC 122 and ARC 221) or (CAD 201 and CAD 211). Lecture 3 hours per week.

CRF 101 | 3 credits  
Hand-Built Pottery  
Introduces fundamental concepts and skills related to hand crafted hand-built pottery. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

CRF 102 | 3 credits  
Wheel-Thrown Pottery  
Introduces fundamental concepts and skills related to hand crafted wheel-thrown pottery. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

CRF 130 | 3 credits  
Glass Blowing I  
Introduces a variety of techniques for manipulating molten “hot glass” into vessel or sculptural forms. Teaches studio safety, equipment operation, techniques of forming molten glass, annealing and cold working techniques. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

CRF 131 | 3 credits  
Glass Blowing II  
Introduces intermediate glass blowing techniques using progressively more complex forms. Emphasis on design and working from prepared drawings. Prerequisite: CRF 130. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

CRF 132 | 3 credits  
Glass Fusing and Painting  
Introduces basic glass fusing, slumping, and painting techniques used to make vessels, fused, and painted glass items. Progresses with more difficult assignments that develop skill and concepts. Discusses historical and contemporary glass techniques, designs, and applications and incorporates into student stained glass work. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.
→ **CRF 230 | 3 credits**  
**Glass Blowing III**  
Introduces advanced techniques of producing blown glass pieces with multiple blown forms. Explores advanced design problems and the development of individual styles. Continues practice in color application, facility, and equipment maintenance and studio operation.  
**Prerequisites:** ART 131 and CRF 131. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ **CRF 231 | 3 credits**  
**Glass Blowing IV**  
Explores advanced glass blowing techniques and color application with the development of a unified body of glass vessels and objects. Examines marketing, sales, studio operation, the process of show application, image, and resume preparation.  
**Prerequisite:** CRF 230. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ **DEVELOPMENTAL MATHEMATICS**

→ **MTT 1 | 1 credit**  
**Developmental Mathematics (Technology-Based) I**  
Covers mathematics topics in a technology-based setting to prepare students for the study of college level mathematics courses and curricula. Designed for the study of one developmental math unit prescribed by the student’s placement test results. Credits not applicable toward graduation.  
**Prerequisite:** Placement scores requiring the student to complete one developmental math unit at MTE 1 or higher.

→ **MTT 2 | 2 credits**  
**Developmental Mathematics (Technology-Based) II**  
Covers mathematics topics in a technology-based setting to prepare students for the study of college level mathematics courses and curricula. Designed for the study of any combination of two developmental math units prescribed by the student’s placement test results. Credits not applicable toward graduation.  
**Prerequisite:** Placement test scores requiring the student to complete two developmental math units at MTE 1 or higher.

→ **MTT 3 | 3 credits**  
**Developmental Mathematics (Technology-Based) III**  
Covers mathematics topics in a technology-based setting to prepare students for the study of college level mathematics courses and curricula. Designed for the study of any combination of three developmental math units prescribed by the student’s placement test results. Credits not applicable toward graduation.  
**Prerequisite:** Placement test scores requiring the student to complete three developmental math units at MTE 1 or higher.

→ **MTT 4 | 4 credits**  
**Developmental Mathematics (Technology-Based) IV**  
Covers mathematics topics in a technology-based setting to prepare students for the study of college level mathematics courses and curricula. Designed for the study of any combination of four developmental math units prescribed by the student’s placement test results. Credits not applicable toward graduation.  
**Prerequisite:** Placement scores requiring the student to complete four developmental math units at MTE 1 or higher.

→ **DMS 206 | 2 credits**  
**Introduction to Sonography**  
Introduces the diagnostic foundations of diagnostic medical sonography, including terminology, scan plane orientations, anatomical relationships, departmental administrative operations, hospital organization and basic patient care principles.  
**Prerequisite:** Admission into program or instructor permission. Lecture 2 hours per week.

→ **DMS 207 | 2 credits**  
**Sectional Anatomy**  
Teaches normal sectional anatomy in the transverse, longitudinal and coronal planes, with correlated sonographic images. Emphasis will be placed on abdominopelvic organs and vasculature.  
**Prerequisite:** Admission into program or instructor permission. Lecture 2 hours per week.
→ DMS 208 | 3 credits
Ultrasound Physics and Instrumentation I
Discusses and solves mathematical problems associated with human tissue, basic instrumentation and scanning technology. Prerequisite: Admission into program or instructor permission. Lecture 3 hours per week.

→ DMS 209 | 3 credits
Ultrasound Physics and Instrumentation II
Focuses on the areas of ultrasonic, instrumentation, image artifacts, biologic effects, quality control, as well as Doppler principles and applications and basic types of equipment through lecture and laboratory exercises. Prerequisites: Admission into program and DMS 208 or instructor permission. Lecture 3 hours per week.

→ DMS 211 | 4 credits
Abdominal Sonography
Examines the clinical applications within the specialty of abdominal sonography including interpretation of normal and abnormal sonographic patterns, pathology, related clinical signs and symptoms, normal variants and clinical laboratory tests. Includes laboratory sessions on basic scanning techniques and protocols. Prerequisite: Admission into program or instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ DMS 212 | 4 credits
Obstetrical and Gynecological Sonography
Presents the clinical applications within the sonographic specialties of obstetrics and gynecology. Includes topics of discussion on normal and abnormal sonographic patterns, related clinical symptoms and associated laboratory tests. Includes laboratory sessions on basic scanning techniques. Prerequisite: Admission into program. Co-requisite: DMS 211 or instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ DMS 221 | 3 credits
Ultrasound Seminar I
Introduces the fundamentals of renal failure and transplantations, small parts sonography, basic echocardiography, neonatal neurosonography, and rare and interesting ultrasonic case presentations. Prerequisite: Admission into program or instructor permission. Lecture 3 hours per week.

→ DMS 222 | 3 credits
Sonography Registry Review
Reviews material covered throughout the sonography program to prepare the student for the ultrasound registry examination. Prerequisite: Admission into program or instructor permission. Lecture 3 hours per week.

→ DMS 223 | 2 credits
Introduction to Vascular Ultrasound
Discusses the principles of vascular ultrasound, the related anatomy and more common pathologies detected as well as the physiology and hemodynamics detected and evaluated with ultrasound. Prerequisites: Admission into program and DMS 211 or instructor permission. Lecture 2 hours per week.

→ DMS 231 | 2 credits
Clinical Education I
Develops the student’s ultrasonic skills in a diagnostic environment; may include on-campus laboratories, private office settings, as well as hospital rotations. May include experiences in abdominal, pelvic, obstetrical, and small parts scanning, as well as echocardiography and vascular sonography. Prerequisite: Admission into program or instructor permission. Laboratory 10 hours per week.

→ DMS 232 | 4 credits
Clinical Education II
Develops the student’s ultrasonic skills in a diagnostic environment; may include on-campus laboratories, private office settings, as well as hospital rotations. May include experiences in abdominal, pelvic, obstetrical, and small parts scanning, as well as echocardiography and vascular sonography. Prerequisites: Admission into program and DMS 231 or instructor permission. Laboratory 20 hours per week.

→ DMS 233 | 5 credits
Clinical Education III
Develops the student’s ultrasonic skills in a diagnostic environment; may include on-campus laboratories, private office settings, as well as hospital rotations. Includes experience in abdominal, pelvic and obstetrical and small parts scanning. Prerequisites: Admission into program and DMS 232 or instructor permission. Laboratory 25 hours per week.
→ **DMS 234 | 6 credits**  
**Clinical Education IV**  
Develops the student's ultrasonic skills in a diagnostic environment. Includes on-campus laboratories, private office settings, as well as hospital rotations. Includes additional experience in abdominal, pelvic, obstetrical, and small parts scanning. **Prerequisites:** Admission into program and DMS 233 or instructor permission. Laboratory 30 hours per week.

→ **DSL 135 | 3 credits**  
**Introduction to Diesel Technology**  
Introduces careers in the diesel repair industry, safety procedures, tools and equipment used in the industry, and component identification. Teaches preventative maintenance inspections (PMI), precision measuring, and the use of electronic databases for service and repair. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **DSL 137 | 5 credits**  
**Basic Diesel Engine Systems**  
Introduces the theory of operation, design, and components of a modern diesel engine. Provides instruction on modern fuel system components and operation. Presents the design and operation of air induction, lubrication, and cooling systems. Demonstrates basic engine diagnostics. Provides preparation for the Automotive Service Excellence (ASE) T2 Engines certification examination. **Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.**

→ **DSL 143 | 4 credits**  
**Diesel Truck Electrical Systems**  
Studies the theory and operation of various truck and tractor electrical systems. Covers preheating, starting, generating, and lighting systems. Uses modern test equipment for measurement, adjustment, and troubleshooting. **Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.**

→ **DSL 145 | 3 credits**  
**Medium/Heavy Duty Truck Preventative Maintenance Inspection**  
Presents the process of implementing a preventive maintenance program, the various inspection procedures required by the original equipment manufacturers (OEM), federal regulations, and the process of related documentation. Provides preparation for the Automotive Service Excellence (ASE) T8 Preventative Maintenance Inspection certification examination. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **DSL 210 | 5 credits**  
**Medium/Heavy Duty Truck Brake Systems**  
Presents the operation of air and hydraulic brake systems. Demonstrates diagnostic and repair procedures in accordance with Federal Motor Vehicle Safety Standards (FMVSS) 121. Presents diagnostic and repair procedures for anti-lock braking systems (ABS) and electronic braking systems (EBS). Provides preparation for the Automotive Service Excellence (ASE) T4 Brakes certification exam. **Lecture 4 hours. Laboratory 3 hours. Total 7 hours per week.**

→ **DSL 212 | 5 credits**  
**Medium/Heavy Duty Truck Steering and Suspension**  
Presents steering and suspension components used on modern medium/heavy duty trucks, including the operation of each system and how it affects the overall operation of the truck. Teaches how to perform a multi axle alignment using industry standard equipment, standard industry techniques, and diagnostic procedures. Provides preparation for the Automotive Service Excellence (ASE) T5 Steering and Suspension certification examination. **Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.**

→ **DSL 214 | 5 credits**  
**Heavy Duty Drive Train Systems**  
Presents modern heavy duty drive train overhaul procedures to include precision measuring and failure analysis. Covers transmission diagnosis and repair using industry standard diagnostic equipment. Demonstrates repair procedures on Power Take-Offs (PTO). Provides preparation for the Automotive Service Excellence (ASE) T3 Drive Train certification exam. **Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.**

→ **DSL 237 | 5 credits**  
**Advanced Diesel Engine Systems**  
Presents modern diesel engine overhaul procedures to include precision measuring and failure analysis. Teaches advanced fuel system diagnosis and repair using industry standard diagnostic equipment. Provides preparation for the Automotive Service Excellence (ASE) T2 Diesel Engines certification exam. **Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.**
DIETETICS

→ DIT 121 | 3 credits
Nutrition I
Studies food composition, dietary guidelines, and nutrients essential to healthy human life. Analyzes nutrient function and metabolism. Lecture 3 hours per week.

→ DIT 125 | 3 credits
Current Concepts in Diet and Nutrition
Studies the importance of diet to health and well-being in daily life. Addresses current controversies over food practices and information, food facts and fiction, fad diets, vegetarianism, diet and heart disease, and sound guidelines for maintaining good health with wise food choices. Applies computer technology for nutritional analysis. Intended especially for the non-dietetic major. Lecture 3 hours per week.

ECONOMICS

→ ECO 120 | 3 credits
Survey of Economics
Presents a broad overview of economic theory, history, development, and application. Introduces terms, definitions, policies, and philosophies of market economies. Provides some comparison with other economic systems. Includes some degree of exposure to microeconomic and macroeconomic concepts. Lecture 3 hours per week.

→ ECO 201 | 3 credits
Principles of Macroeconomics
Introduces macroeconomics including the study of Keynesian, classical, monetarist principles and theories, the study of national economic growth, inflation, recession, unemployment, financial markets, money and banking, the role of government spending and taxation, along with international trade and investments. Lecture 3 hours per week.

→ ECO 202 | 3 credits
Principles of Microeconomics
Introduces the basic concepts of microeconomics. Explores the free market concepts with coverage of economic models and graphs, scarcity and choices, supply and demand, elasticities, marginal benefits and costs, profits, and production and distribution. Lecture 3 hours per week.

→ ECO 210 | 3 credits
International Economics
Analyzes the nature, performance and problems of market and non-market economic systems with emphasis on post World War II experience. Lecture 3 hours per week.

EDUCATION

→ EDU 200 | 3 credits
Introduction to Teaching as a Profession
Provides an orientation to the teaching profession in Virginia, including historical perspectives, current issues, and future trends in education on the national and state levels. Emphasizes information about teacher licensure examinations, steps to certification, teacher preparation and induction programs, and attention to critical shortage areas in Virginia. Includes supervised field placement (recommended: 40 clock hours) in a K-12 school. Prerequisite: 24 credits of transfer courses, 15 of which must be completed prior to enrolling. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ EDU 247 | 4 credits
Adult Independent Living and Vocational Skills for Disabled
Emphasizes skills required to develop competencies in teaching developmentally disabled individuals ages 16 and older in vocational training settings. Develops competencies related to teaching independent living and mobility skills, occupational behavior skills, and job task performance skills. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EDU 250 | 4 credits
Introduction to Developmental Disabilities
Presents an overview, history, and current philosophy of the developmental disabilities program. Provides descriptions and examines causes of developmental disabilities, identifies intervention strategies, promotes social and legal advocacy,
explores employment and career opportunities. Laboratory experiences include a minimum of ten hours of observation of work settings. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EDU 254 | 3 credits
Teaching Basic Academic Skills to Exceptional Children
Develops competencies required to teach readiness and basic skills to children with special needs in private or public school settings. Includes the preparation of lesson plans, instructional units, and Individualized Education Programs (IEP’s). Includes child abuse recognition and intervention training. Emphasizes exceptionalities for students ages 2-21 under Public Law 94-142. Familiarizes students with the indicators of effective teaching. Lecture 3 hours per week.

→ EDU 255 | 4 credits
Behavior Modification in School and Community Settings
Presents basic principles of behavior modification and behavioral learning theory. Promotes skills in pinpointing, observing, and recording human behavior. Includes learning objectives that address attitude, knowledge, and mental and physical skill competencies needed for implementing behavioral programs. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EDU 270 | 3 credits
Introduction to Autism Spectrum Disorders
Explores the nature of autism and related developmental disorders. Details and discusses current evaluation and assessment measures in ASD. Discusses current intervention strategies and their implementation in the school setting. Lecture 3 hours per week.

→ ELE 127 | 3 credits
Residential Wiring Methods
Studies wiring methods and standards used for residential dwellings. Provides practical experience in design, layout, construction, and testing of residential wiring systems by use of scaled mock-ups. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ ELE 131-132 | 4 credits each
National Electrical Code I-II
Provides a comprehensive study of the purpose and interpretations of the National Electrical Code as well as familiarization and implementation of various charts, code rulings and wiring methods including state and local regulations. Lecture 4 hours per week.

→ ELE 145 | 2 credits
Transformer Connections and Circuits
Studies transformer theory, symbols, diagrams, connections, terminology and troubleshooting techniques. Prerequisite: ELE 150 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ ELE 146 | 4 credits
Electric Motor Control
Studies solid state devices with application and emphasis toward control of power. Includes diodes, SCR’s, photoelectric controls, timing, circuits, voltage regulation and three phase rectifiers. Prerequisite: ELE 150 or equivalent. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ ELE 148 | 3 credits
Power Distribution Systems
Introduces transmission and distribution of electrical power. Includes application of transformers, distribution and overcurrent protection devices, substations, switchboards, feeders, busways, motor control centers, generators, motors, and troubleshooting techniques associated with these systems and devices. Prerequisite: ELE 150. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ ELE 149 | 3 credits
Wiring Methods in Industry
Studies the fundamentals of industrial power distribution, circuits, switches, enclosures, panels, fuses, circuit breakers, transformers, and wiring methods using various charts and tables of the National Electrical Code. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ ELE 150 | 3 credits
A.C. and D.C. Circuit Fundamentals
Provides an intensive study of the fundamentals of direct and alternating current, resistance, magnetism, inductance and capacitance, with emphasis on practical applications. Focuses on electrical/machine applications. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.
→ **ELE 174 | 3 credits**  
Fiber Optic Connections  
Introduces construction of fiber optic cable connections to a quality acceptable in the industry today. Includes types of cabling, connectors and splices, installation techniques and hardware in fiber optic systems. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **ELE 176 | 3 credits**  
Introduction to Alternative Energy Including Hybrid Systems  
Introduces Alternative Energy with an emphasis on solar photovoltaic systems, small wind turbines technology, the theory of PV technology, PV applications, solar energy terminology, system components, site analysis, PV system integration and PV system connections and small wind turbine technology site analysis. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **ELE 178 | 4 credits**  
Wind Turbine Technology  
Introduces many facets of the wind industry. Introduces the history and development of the wind systems as well as the future of the wind industry as the desire for alternative energy grows. Presents the terminology used in the application of wind systems. Identifies the various types of wind energy turbines and other topics as appropriate. Includes safety training. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ELE 179 | 3 credits**  
Satellite Dish Installation  
Introduces installation, testing, troubleshooting, and repair of satellite dish systems. Prepares students for the Electronics Technician Association Certified Satellite Installer (CSI) certification necessary to compete for entry-level positions in the satellite installation industry. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **ELE 188 | 4 credits**  
Geothermal Technology for Electricians  
Provides an introduction to the use of geothermal energy as it applies to electricians. Introduces geothermal system design, installation, and maintenance. Focuses on site surveys, soil types, header design, loop types, pump sizing, flushing and purging. Introduces the feasibility of heat pump applications for local use on an individual basis. Includes safety training. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ELE 189 | 3 credits**  
Data Cabling Communication  
Introduces construction, testing, troubleshooting, and repair of a variety of copper cables. Prepares students for the Electronics Technician Association Data Cable Installer Certification (DCIC) necessary to compete for entry-level positions in a wide range of networking, security and video companies. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **ELE 211 | 3 credits**  
Electrical Machines I  
Studies the construction, theory of operations and applications of DC and AC machines. **Prerequisite: ETR 114 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **ELE 217 | 3 credits**  
Electric Power Utilities  
Provides an introduction to the electric power utilities field. Examines the generation, transmission and distribution of electrical energy. **Lecture 3 hours per week.**

→ **ELE 229 | 3 credits**  
Troubleshooting and Maintenance of Electrical Systems  
Introduces techniques of troubleshooting electrical systems and equipment such as motors, relays, power distribution, lighting, solenoids, and generators. Includes hands-on lab practices to develop and perform problem solving skills, repair and preventative maintenance of various types of electrical equipment using wiring diagrams, special meters, various troubleshooting procedures and safety practices. **Prerequisites: ELE 146 and ELE 150. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **ELE 233-234 | 3 credits each**  
Programmable Logic Controller Systems I-II  
Teaches operating and programming of programmable logic controllers. Covers analog and digital interfacing and communication schemes as they apply to systems. **Prerequisite or co-requisite for ELE 233: ELE 146. Prerequisite for ELE 234: ELE 146. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **ELE 239 | 3 credits**  
Programmable Logic Controllers  
Examines installation, programming, interfacing, and concepts of troubleshooting programmable controllers. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**
→ **ELE 246 | 3 credits**  
**Industrial Robotics Programming**  
Introduces industrial robotics and their programming for repetitive manufacturing systems. Includes the design of software that ensures safe operation and programming of both on- and off-line robot operations. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **ELE 248 | 3 credits**  
**Microcontroller Interfacing and Programming**  
Explores issues and concerns related to the programming and interfacing of microcontrollers. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **ELE 250 | 3 credits**  
**Fiber Optics Technology**  
Introduces testing, troubleshooting, and repair of fiber optic systems. Prepares students for the Electronics Technician Association Fiber Optics Technician (FOT) certification necessary to compete for technician level positions in a wide range of networking, security and video companies. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **ETR 104 | 4 credits**  
**Electronic Fundamentals with Computer Applications**  
Provides an introduction to the fundamentals of D.C. and A.C. circuit analysis and computer applications. Includes the study of electrical units and components, series, parallels, series-parallel D.C. and A.C. circuits, inductive and capacitive reactance, impedance and use of circuit analysis software. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ETR 112 | 2 credits**  
**Math Applications for ELE/ETR Analysis**  
Presents mathematical applications for ELE/ETR students. Includes mathematical concepts and problems in algebra and trigonometry, and direct application to electronic analysis. Includes a survey of advanced mathematics to develop and reinforce electronic concepts. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **ETR 113-114 | 4 credits each**  
**D.C. and A.C. Fundamentals I-II**  
Studies D.C. and A.C. circuits, basic electrical components, instruments, network theorems, and techniques used to predict, analyze and measure electrical quantities. **Prerequisites for ETR 113: ETR 104 and MTH 164 or MTH 166. Prerequisite for ETR 114: ETR 113. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ETR 116 | 4 credits**  
**D.C. and A.C. Circuit Analysis**  
Covers background information required by the Electronics Engineering Technology program but not covered in military electronic schools. Includes D.C. and A.C. circuit analysis techniques such as Thevenin, Norton, Mesh, Nodal, branch current, three phase power, two port parameters, etc. **Corequisite: MTH 164 or MTH 166. Lecture 4 hours per week.**

→ **ETR 148 | 4 credits**  
**Amplifiers and Integrated Circuits**  
Studies devices and amplifiers with emphasis on analysis and design. May include summing and integrating amplifiers, choppers, modulators and other circuits. **Prerequisite: ETR 113. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ETR 174 | 4 credits**  
**Virtual Instrumentation**  
Provides an introduction to virtual instrumentation, data acquisition, and instrument control using LabVIEW. Includes structures, arrays, clusters, charts, graphs, strings, file I/O, and data analysis. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ETR 193 | 4 credits**  
**Introduction to LabVIEW**  
An introductory course in virtual instrumentation, data acquisition, and instrument control, all using LabVIEW. Structures, arrays and clusters, charts and graphs, strings and file I/O, and data analysis will be introduced for student application programs. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ETR 203 | 3 credits**  
**Electronic Devices I**  
Studies active devices and circuits such as diodes, power supplies, transistors, amplifiers, and others. **Prerequisite: ELE 150. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**
→ ETR 250 | 4 credits
Solid State Circuits
Teaches theory and application of amplifiers and oscillators. Includes amplifier circuit configurations, amplifier classes, operational amplifiers, power amplifiers, bandwidth distortion, and principles of feedback. **Prerequisite:** ETR 148. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ ETR 261 | 4 credits
Microprocessor Application I
Teaches the fundamentals of microprocessors including architecture, internal operations, memory, I/O devices, machine level programming and interfacing. Emphasizes instrumentation and microprocessor. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ ETR 279 | 4 credits
Digital Principles, Terminology and Applications
Studies digital principles, terminology and applications covering number systems, arithmetic, Boolean algebra, Karnaugh maps and advanced logic circuits. Includes the study of registers, encoding and decoding, and multiplexing; A/D, D/A, displays and others. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ ETR 281 | 3 credits
Digital Systems
Includes basic numbering systems, Boolean algebra, logic circuits and systems, pulse circuits and pulse logic systems as applied to computer and microprocessor technology. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ EMS 111 | 7 credits
Emergency Medical Technician
Prepares student for certification as a Virginia and National Registry EMT-Basic. Focuses on all aspects of pre-hospital basic life support as defined by the Virginia Office of Emergency Medical Services curriculum for Emergency Medicine Technician. **Prerequisite:** CPR certification at the Health Care Provider level (provided first day of class.) Co-requisite: EMS 120. Lecture 5 hours. Laboratory 4 hours. Total 9 hours per week.

→ EMS 115 | 2 credits
Emergency Medical Technician - Basic Refresher
Provides 36 clock hours of instruction to meet Virginia Office of EMS requirements for recertification at the EMT-Basic level. Lecture 2 hours per week.

→ EMS 120 | 1 credit
Emergency Medical Technician – Basic Clinical
Observes in a program approved clinical/field setting. Co-requisite: EMS 111. Laboratory 2 hours per week.

→ EMS 151 | 4 credits
Introduction to Advanced Life Support
Prepares the student for Virginia Enhanced certification eligibility and begins the sequence for National Registry Intermediate and/or Paramedic certification. Includes the theory and application of the following: foundations, human systems, pharmacology, overview of shock, venous access, airway management, patient assessment, respiratory emergencies, allergic reaction, and assessment based management. Conforms at a minimum to the Virginia Office of Emergency Medical Services curriculum. **Co-requisite:** EMS 170. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EMS 152 | 2 credits
Advanced EMT Completion
Continues the Virginia Office of Emergency Medical Services Advanced, Intermediate and/or Paramedic curricula. Includes patient assessment, differential diagnosis and management of multiple complaints. Includes, but are not limited to conditions relating to diabetic, neurological, abdominal pain, environmental, behavioral, gynecology, and toxicological disease conditions. Also includes Advanced EMT level cardiac, trauma and special population topics. **Prerequisite:** Current EMT Certification and EMS 151. Co-requisite: EMS 151. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ EMS 153 | 2 credits
Basic ECG Recognition
Focuses on the interpretation of basic electrocardiograms (ECG) and their significance. Includes an overview of anatomy and physiology of the cardiovascular system including structure, function and electrical conduction in the heart. Covers advanced concepts that build on the knowledge and skills of basic dysrhythmia determination and introduction to 12 lead ECG. Lecture 2 hours per week.
EMS 155 | 4 credits
ALS - Medical Care
Continues the Virginia Office of Emergency Medical Services Intermediate and/or Paramedic curricula. Includes ALS pharmacology, drug and fluid administration with emphasis on patient assessment, differential diagnosis and management of multiple medical complaints. Includes, but is not limited to, conditions relating to cardiac, diabetic, neurological, non-traumatic abdominal pain, environmental, behavioral, gynecological, and toxicological disease conditions. Prerequisite: Current EMT-B certification. Co-requisites: EMS 151 and EMS 153. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

EMS 157 | 3 credits
ALS - Trauma Care
Continues the Virginia Office of Emergency Medical Services Intermediate and/or Paramedic curricula. Utilizes techniques which will allow the student to utilize the assessment findings to formulate a field impression and implement the treatment plan for the trauma patient. Prerequisites: Current EMT-B certification and EMS 151. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

EMS 159 | 3 credits
ALS - Special Populations
Continues the Virginia Office of Emergency Medical Services Intermediate and/or Paramedic curricula. Focuses on the assessment and management of specialty patients including obstetrical, neonates, pediatric, and geriatrics. Prerequisites: EMS 151 and EMS 153. Prerequisite or co-requisite: EMS 155. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

EMS 161 | 1 credit
Basic Trauma Life Support (BTLS)
Offers instruction for students in current topics of care for trauma patients and offers certification as a Basic Trauma Life Support Provider (BTLS) as defined by the American College of Emergency Physicians. Prerequisite: Divisional approval. Lecture 1 hour per week.

EMS 165 | 1 credit
Advanced Cardiac Life Support (ACLS)
Prepares for certification as an Advanced Cardiac Life provider. Follows course as defined by the American Heart Association. Prerequisite: EMS 153 or equivalent. Lecture 1 hour per week.

EMS 169 | 1 credit
Pediatric Advanced Life Support (PALS)
Prepares the student for certification as a pediatric advanced life support provider as defined by the American Heart Association. Covers primary assessment and emergency care of infants and children. Lecture 1 hour per week.

EMS 170 | 1 credit
ALS Internship I
Begins the first in a series of clinical experiences providing supervised direct patient contact in appropriate patient care facilities in and out of hospitals. Includes, but not limited to, patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room, Trauma centers, and various advanced life support units. Laboratory 3 hours per week.

EMS 172 | 1 credit
ALS Clinical Internship II
Continues with the second in a series of clinical experiences providing supervised direct patient contact in appropriate patient care facilities in and out of hospitals. Includes, but not limited to, patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room, and Trauma Centers. Prerequisite: EMS 151. Laboratory 3 hours per week.

EMS 173 | 1 credit
ALS Field Internship II
Continues with the second in a series of field experiences providing supervised direct patient care in out-of-hospital advanced life support units. Laboratory 3 hours per week.

EMS 201 | 3 credits
EMS Professional Development
Prepares students for Paramedic certification at the National Registry Level by fulfilling community activism, personal wellness, resource management, ethical considerations in leadership and research objectives in the Virginia Office of Emergency Medical Services Paramedic curriculum. Prerequisite: Divisional approval. Lecture 3 hours per week.

EMS 205 | 4 credits
Advanced Pathophysiology
Focuses on the pathological processes of disease with emphasis on the anatomical and physiological alterations of the human body by systems. Includes diagnosis and management appropriate to the advanced health care provider in and out of the hospital environment. Prerequisite: EMS 155. Lecture 4 hours per week.
→ EMS 207  |  3 credits
Advanced Patient Assessment
Focuses on the principles of normal and abnormal physical exam. Emphasizes the analysis and interpretation of physiological data to assist in patient assessment and management. Applies principles during the assessment and management of trauma, medical, and specialty patients in laboratory environment. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ EMS 209  |  4 credits
Advanced Pharmacology
Focuses on the principles of pharmacokinetics, pharmacodynamics and drug administration. Includes drug legislation, techniques of medication administration, and principles of math calculations. Emphasizes drugs used to manage respiratory, cardiac, neurological, gastrointestinal, fluid and electrolyte and endocrine disorders and includes classification, mechanism of action, indications, contraindications, precautions, and patient education. Incorporates principles related to substance abuse and hazardous materials. Applies principles during the assessment and management of trauma, medical, and specialty patients in a laboratory environment. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EMS 211  |  2 credits
Operations
Prepares the student in the theory and application of the following: medical incident command, rescue awareness and operations, hazardous materials incidents, and crime scene awareness. (Conforms to the current Virginia Office of Emergency Medical Services curriculum for EMT-Paramedics.) Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ EMS 216  |  1 credit
Paramedic Review
Provides the student with intensive review for the practical and written portions of the National Registry Paramedic exam. May be repeated once, for credit. Lecture 1 hour per week.

→ EMS 240  |  1 credit
ALS Internship II
Continues clinical and/or field experiences providing supervised direct patient contact in appropriate patient care facilities in and out of hospitals. Includes, but not limited to, patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room, Trauma Centers and various advanced life support units. Laboratory 3 hours per week.

→ EMS 242  |  1 credit
ALS Clinical Internship III
Continues with the third in a series of clinical experiences providing supervised direct patient contact in appropriate patient care facilities in-and-out of hospitals. Includes, but not limited to, patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room, Trauma Centers, and various advanced life support units. Laboratory 3 hours per week.

→ EMS 243  |  1 credit
ALS Field Internship III
Continues with the third in a series of field experiences providing supervised direct patient care in out-of-hospital advanced life support units. Laboratory 3 hours per week.

→ EMS 244  |  1 credit
ALS Clinical Internship IV
The fourth in a series of clinical experiences providing direct patient contact in appropriate patient care facilities in-and-out of hospitals. Includes, but not limited to, patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room, and Trauma Centers. May be repeated as necessary. Laboratory 3 hours per week.

→ EMS 245  |  1 credit
ALS Field Internship IV
Continues with the fourth in a series of field experiences providing supervised direct patient care in out-of-hospital advanced life support units. May be repeated as necessary. Laboratory 3 hours per week.

→ EMS 253  |  4 credits
ALS Refresher
Reviews material covered in the ALS programs. Meets all required criteria for recertification eligibility. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EMS 255  |  5 credits
Concepts in Critical Care
Prepares the paramedic or RN to become a critical care specialist, capable of managing the care of a critical care patient both in a hospital setting or during a high risk inter-facility transfer. Includes advanced concepts that build on the knowledge and skills of the paramedic and/or nursing curricula, as well as topics needed to troubleshoot complex monitoring devices and equipment. Includes anatomy and physiology based clinical assessment, advanced airway management to include mechanical ventilators, diagnostics
data interpretation, bedside hemodynamic monitoring, 12 lead EKG interpretation, and hemodialysis care. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

→ **EMS 256 I 2 credits**  
12 Lead ECG Interpretation  
Prepares student to interpret 12 lead electrocardiograms and recognize acute myocardial injury as well as infarct imitators. Includes lead placement, collection of the 12 lead ECG, review of cardiac anatomy and physiology, electrical conduction through the heart, common dysrhythmias, pathophysiology of AMI and infarct imitators. Includes field treatment of the acute coronary syndrome. Lecture 2 hours per week.

**ENERGY TECHNOLOGY**

→ **ENE 100 I 4 credits**  
Conventional and Alternate Energy Applications  
Provides an overview of hydroelectric, coal, and nuclear energy production methods and renewable solar, geothermal, wind, and fuel cell technology. A complete system breakdown of conventional power production methods, efficiency, and sustainability when compared with solar, geothermal, wind, and fuel cell applications. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ **ENE 105 I 4 credits**  
Solar Thermal Active and Passive Technology  
Provides a comprehensive study of thermal technology as it applies to collector types and ratings, open-loop versus closed-loop and system sizing. Introduces hydronics, hot water, and pool heating applications. Provides an introduction to fluid dynamics and chemistry as it applies to system installation and maintenance. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ **ENE 110 I 4 credits**  
Solar Power Installations  
Covers wiring, control, conversion, and ties to established power systems. Studies use of invertors, batteries, and charging systems. Prerequisite: ELE 150. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ **ENE 120 I 4 credits**  
Solar Power - Photovoltaic and Thermal  
Studies the production and conversion of electrical energy from modular to grid power systems. Covers the storage of energy, thermal solar capture, and storage for residential and commercial applications. Covers energy conversion and storage equipment based on size and efficiency. Prerequisite: ELE 150. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ **ENE 225 I 4 credits**  
Commercial/Industrial Photovoltaic Design and Installation  
Studies the design and construction of electrical energy from utility interactive grid-tied power systems. Covers the request for proposals, design stages, installation and management for commercial and industrial applications. Covers engineering principles for large scale renewable energy photovoltaic systems. Includes the installation, testing and troubleshooting of commercial/industrial power generation system. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ENGINEERING**

→ **EGR 110 I 3 credits**  
Engineering Graphics  
Presents theories and principles of orthographic projection. Studies multiview, pictorial drawings and sketches, geometric construction, sectioning, lettering, tolerancing, dimensioning and auxiliary projections. Studies the analysis and graphic presentation of space relationships of fundamental geometric elements; points, lines, planes and solids. Includes instruction in Computer-Aided Drafting. Prerequisite: MTH 164, MTH 166 or placement into MTH 173. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ **EGR 120 I 2 credits**  
Introduction to Engineering  
Introduces the engineering profession, professional concepts, ethics, and responsibility. Reviews hand calculators, number systems, and unit conversions. Introduces the personal computer and operating systems. Includes engineering problem-solving techniques using computer software. Prerequisite: MTH 164, MTH 166 or placement into MTH 173. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.
→ EGR 125  |  4 credits
**Introduction to Engineering Methods**
Applies problem-solving techniques to engineering problems utilizing computer programming and algorithms in a higher level computer language such as FORTRAN, PASCAL, or C++. **Prerequisites:** EGR 110 and EGR 120. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EGR 140  |  3 credits
**Engineering Mechanics - Statics**
Introduces mechanics of vector forces and space, scalar mass and time, including S.I. and U.S. customary units. Teaches equilibrium, free-body diagrams, moments, couples, distributed forces, centroids, moments of inertia analysis of two-force and multi-force members, and friction and internal forces. **Prerequisite:** EGR 120. **Co-requisite:** MTH 174. Lecture 3 hours per week.

→ EGR 218  |  3 credits
**Introduction to Modeling and Simulation**
Introduces basic concepts in modeling, simulation, and visualization. Includes applications in various phases of product creation and development; use of software and hardware interfaces to improve use and understanding of simulations; and current topics and future directions in modeling, simulation, and visualization. **Prerequisites:** MTH 173 and EGR 125. Lecture 3 hours per week.

→ EGR 230  |  4 credits
**Discrete Event Simulation**
Introduces fundamentals of modeling and simulating discrete-state, event-driven systems. Includes basic simulation concepts and terms, queuing theory models for discrete event systems, structure of discrete event simulations, problem formulation and specification, input data representation, output data analysis, verification and validation, and the design of simulation experiments. **Prerequisites:** EGR 218 and MTH 243. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ EGR 245  |  3 credits
**Engineering Mechanics - Dynamics**
Presents approach to kinematics of particles in linear and curvilinear motion. Includes kinematics of rigid bodies in plane motion. Teaches Newton's second law, work-energy and power, impulse and momentum, and problem solving using computers. **Prerequisite:** EGR 140. Lecture 3 hours per week.

→ EGR 246  |  3 credits
**Mechanics of Materials**
Teaches concepts of stress, strain, deformation, internal equilibrium, and basic properties of engineering materials. Analyzes axial loads, torsion, bending, shear and combined loading. Studies stress transformation and principle stresses, column analysis, and energy principles. **Prerequisite:** EGR 140. Lecture 3 hours per week.

→ EGR 247  |  1 credit
**Mechanics of Materials Laboratory**
Examines mechanical behavior of bars, rods, shafts, tubes and beams subjected to various types of loading. Introduces experimental stress analysis techniques, such as the use of strain gauges and data reduction. **Prerequisite:** EGR 140. **Co-requisite:** EGR 246. Laboratory 2 hours per week.

→ EGR 262  |  2 credits
**Fundamental Circuits Laboratory**
Covers topics including microprocessor hardware and programming, lab test equipment, lab safety, technical report writing, and using a microprocessor, such as the MicroStamp 11, to control basic electric circuits. Experiments include topics such as resistive circuits, analog-to-digital and digital-to-analog conversion, pulse width modulation, and the design of power supplies. **Prerequisites:** EGR 125 and EGR 271. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ EGR 270  |  4 credits
**Fundamentals of Computer Engineering**
Covers the design and organization of digital systems, including number systems, Boolean algebra, logic gates, Karnaugh maps, combinational and sequential logic circuits, timing diagrams, and synchronous and asynchronous controllers. Introduces hardware description language (HDL) and assembly language programming. **Prerequisite:** EGR 125. **Prerequisite or Co-requisite:** EGR 271. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ EGR 271  |  3 credits
**Circuit Theory I**
Teaches basic electrical concepts and laws, the formulation of network equations for resistive networks based on the use of graph theory and linear algebra, network theorems, and network reduction techniques. **Prerequisite:** EGR 110. **Corequisite:** MTH 279. Lecture 3 hours per week.
→ **EGR 272 | 3 credits**  
Circuit Theory II  
Introduces expansion of network equation formulation to include inductive and capacitive networks; network analysis using the differential equations, Laplace transforms, and phasor; transfer functions; frequency response; and mutual inductance. **Prerequisites:** EGR 271 and MTH 279. Lecture 3 hours per week.

→ **ENG 108 | 3 credits**  
Critical Reading and Study Skills  
Helps students improve their reading and learning processes. Includes advanced comprehension strategies and study skills such as time management, note-taking, studying from textbooks and other reading materials, taking examinations, and using the library. **Prerequisite:** Qualifying Placement Test score. Lecture 3 hours per week.

→ **ENG 111 | 3 credits**  
College Composition I  
Introduces students to critical thinking and the fundamentals of academic writing. Through the writing process, students refine topics; develop and support ideas; investigate, evaluate, and incorporate appropriate resources; edit for effective style and usage; and determine appropriate approaches for a variety of contexts, audiences, and purposes. Writing activities will include exposition and argumentation with at least one researched essay. **Prerequisite:** Qualifying Placement Test score or ENF 1, ENF 2 or equivalent. Lecture 3 hours per week.

→ **ENG 112 | 3 credits**  
College Composition II  
Continues to develop college writing with increased emphasis on critical essays, argumentation, and research, developing these competencies through the examination of a range of texts about the human experience. Requires students to locate, evaluate, integrate, and document sources and effectively edit for style and usage. **Prerequisites:** ENG 111 or equivalent and ability to use word processing software. Lecture 3 hours per week.

→ **ENG 115 | 3 credits**  
Technical Writing  
Develops ability in technical writing through extensive practice in composing technical reports and other documents. Guides students in achieving voice, tone, style, and content in formatting, editing, and graphics. Introduces students to technical discourse through selected reading. **Prerequisite:** Qualifying Placement Test score or ENF 1, ENF 2 or equivalent. Lecture 3 hours per week.

→ **ENG 125 | 3 credits**  
Introduction to Literature  
Introduces students to a range of literary genres that may include poetry, fiction, drama, creative nonfiction, and other cultural texts, as it continues to develop college writing. **Prerequisite:** ENG 111. Lecture 3 hours per week.

→ **ENG 131 | 3 credits**  
Technical Report Writing I  
Offers a review of organizational skills including paragraph writing and basic forms of technical communications, various forms of business correspondence, and basic procedures for research writing. Includes instruction and practice in oral communication skills. **Prerequisite:** ENG 111 or divisional approval. Lecture 3 hours per week.

→ **ENG 210 | 3 credits**  
Advanced Composition  
Helps students refine skills in writing non-fiction prose. Guides development of individual voice and style. Introduces procedures for publication. **Prerequisite:** ENG 112 or divisional approval. Lecture 3 hours per week.

→ **ENG 211-212 | 3 credits each**  
Creative Writing I-II  
Introduces the student to the fundamentals of writing imaginatively. Students write in forms to be selected from poetry, fiction, drama, and essays. **Prerequisite:** ENG 112 or divisional approval. Lecture 3 hours per week.

→ **ENG 236 | 3 credits**  
Introduction to the Short Story  
Examines selected short stories emphasizing the history of the genre. Involves critical reading and writing. **Prerequisite:** ENG 112 or divisional approval. Lecture 3 hours per week.
→ ENG 241-242 | 3 credits each  
Survey of American Literature I-II  
Examines American literary works from colonial times to the present, emphasizing the ideas and characteristics of our national literature. Involves critical reading and writing. 
Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

→ ENG 243-244 | 3 credits each  
Survey of English Literature I-II  
Studies major English works from the Anglo-Saxon period to the present, emphasizing ideas and characteristics of the British literary tradition. Involves critical reading and writing. 
Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

→ ENG 251-252 | 3 credits each  
Survey of World Literature I-II  
Examines major works of world literature. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

→ ENG 253-254 | 3 credits each  
Survey of African-American Literature I-II  
Examines selected works by African-American writers from the colonial period to the present. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

→ ESL 31 | 4 credits  
Composition I  
Provides instruction and practice in the writing process, emphasizing development of fluency in writing and competence in structural and grammatical patterns of written English. Credits are not applicable toward graduation. 
Prerequisite: Qualifying ESL Placement Test score or ESL 20. Lecture 4 hours per week.

→ ESL 32 | 4 credits  
Reading I  
Helps students improve their reading comprehension and vocabulary development. Improves students' reading proficiency to a level which would allow the student to function adequately in ESL 42 and other college classes. 
Prerequisite: Qualifying ESL Placement Test score or ESL 20. Lecture 4 hours per week.

→ ESL 33 | 4 credits  
Oral Communication I  
Helps students practice and improve listening and speaking skills as needed for functioning successfully in academic, professional, and personal settings. Assesses students' oral skills and includes, as needed, practice with pronunciation, rhythm, stress and intonation. Provides exercises, practices, small and large group activities, and oral presentations to help students overcome problems in oral communication. Credits are not applicable toward graduation. 
Prerequisite: Qualifying ESL Placement Test score or ESL 20. Lecture 4 hours per week.

→ ESL 41 | 4 credits  
Composition II  
Provides further instruction and practice in the writing process, and introduces advanced language patterns. Includes practice in developing and improving writing strategies. Credits are not applicable toward graduation. 
Prerequisite: Qualifying ESL Placement Test score or ESL 31. Lecture 4 hours per week.

→ ESL 42 | 4 credits  
Reading II  
Improves students' reading proficiency to a level that would allow the student to function adequately in the ESL 52 reading class and other college courses. Courses are not applicable toward graduation. 
Prerequisite: Qualifying ESL Placement Test score or ESL 32. Lecture 4 hours per week.
→ **ESL 43 | 4 credits**  
**Oral Communication II**  
Provides further instruction and practice in helping students to improve listening and speaking skills. Assesses students’ oral skills and includes, as needed, practice with pronunciation, rhythm, stress, and intonation. Emphasizes the development of fluency through exercises, practices, small and large group activities, and formal and informal presentations. **Prerequisite:** Qualifying ESL Placement Test score or ESL 33. Lecture 4 hours per week.

→ **ESL 51 | 4 credits**  
**Composition III**  
Prepares students for college-level writing by practice in the writing process, emphasizing development of thought in essays of greater length and complexity, and use of appropriate syntax and diction. Credits are not applicable toward graduation. **Prerequisite:** Qualifying ESL Placement Test score or ESL 41. Lecture 4 hours per week.

→ **ESL 52 | 4 credits**  
**Reading III**  
Emphasizes applying and synthesizing ideas. Includes ways to detect organization, summarize, make inferences, draw conclusions, evaluate generalizations, recognize differences between facts and opinions, and introduces other advanced comprehension strategies. May also include comprehensive library skills. Credits are not applicable toward graduation. **Prerequisite:** Qualifying ESL Placement Test score or ESL 42. Lecture 4 hours per week.

→ **ENF 1 | 8 credits**  
**Preparing for College English I**  
Provides integrated reading and writing instruction for students who require extensive preparation to succeed in college-level English courses. Upon successful completion and faculty recommendation, students will move into Preparing for College English III (if they require additional preparation) or into college-level English (if they require no additional preparation). **Prerequisite:** Qualifying Placement Test score. Lecture 8 hours per week.

→ **ENF 2 | 4 credits**  
**Preparing for College English II**  
Provides integrated reading and writing instruction for students who require intermediate preparation to succeed in college-level English courses. Upon successful completion and faculty recommendation, students will move into Preparing for College Level III (if they require additional preparation) or into college-level English (if they require no additional preparation). Credit is not applicable toward graduation. **Prerequisite:** Qualifying Placement Test score. Lecture 4 hours per week.

→ **ENF 3 | 2 credits**  
**Preparing for College English III**  
Provides integrated reading and writing instruction for students who require minimal preparation for college-level English but still need some preparation to succeed. **Prerequisite:** Qualifying Placement Test score or faculty recommendation. Co-requisite: ENG 111. Lecture 2 hours per week.

**ENVIRONMENTAL SCIENCE**

→ **ENV 121 | 4 credits**  
**General Environmental Science I**  
Explores fundamental components and interactions that make up the natural systems of the earth. Introduces the basic science concepts in the disciplines of biological, chemical, and earth sciences that are necessary to understand and address environmental issues. Lecture 3 hours. Recitation and Laboratory 3 hours. Total 6 hours per week.

→ **ENV 122 | 4 credits**  
**General Environmental Science II**  
Explores fundamental interactions between human populations and natural systems of the earth. Introduces the basic science behind the causes, effects, and mitigation of major environmental issues. Part II of II. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **ENV 220 | 3 credits**  
**Environmental Problems**  
Studies the relationship of man to his environment; ecological principles, population dynamics, topics of current importance including air, water, and noise pollution; poisoning and toxicity, radiation, conservation and management of natural resources. Lecture 3 hours per week.
$\text{FINANCIAL SERVICES}$

→ **FIN 107 | 3 credits**  
**Personal Finance**  
Presents a framework of personal money management concepts, including establishing values and goals, determining sources of income, managing income, preparing a budget, developing consumer buying ability, using credit, understanding savings and insurance, providing for adequate retirement, and estate planning.  
Lecture 3 hours per week.

→ **FIN 110 | 3 credits**  
**Principles of Banking**  
Presents nearly every aspect of banking, providing a comprehensive introduction to the diversified services and operations of the banking industry. Focuses on new trends gaining attention in banking circles. Recommended for all banking students.  
Lecture 3 hours per week.

→ **FIN 115 | 2 credits**  
**Personal Investments**  
Examines personal financial investments, money management and risk reward strategies. Covers most widely employed investment instruments, including current information on stocks, bonds, mutuals, real estate, limited partnerships and tax sheltering devices.  
Lecture 2 hours per week.

→ **FIN 215 | 3 credits**  
**Financial Management**  
Introduces basic financial management topics including statement analysis, working capital, capital budgeting, and long-term financing. Focuses on Net Present Value and Internal Rate of Return techniques, lease vs. buy analysis, and Cost of Capital computations. Uses problems and cases to enhance skills in financial planning and decision making.  
Prerequisite: ACC 212.  
Lecture 3 hours per week.

→ **FIN 260 | 2 credits**  
**Financial Management for Small Business**  
Provides the tools of financial planning for the small business owner. Includes areas such as financial statements, ratio analysis, forecasting profit, cash flow, pricing, and obtaining capital.  
Prerequisites: ACC 220 or ACC 211 and BUS 165.  
Lecture 2 hours per week.

$\text{FIRE SCIENCE TECHNOLOGY}$

→ **FST 100 | 3 credits**  
**Principles of Emergency Services**  
Provides an overview to fire protection; career opportunities in fire protection and related fields; philosophy and history of fire protection/service; fire loss analysis; organization and function of public and private fire protection services; fire departments as part of local government; laws and regulations affecting the fire service; fire service nomenclature; specific fire protection functions; basic fire chemistry and physics; introduction to fire protection systems; introduction to fire strategy and tactics.  
Lecture 3 hours per week.

→ **FST 110 | 3 credits**  
**Fire Behavior and Combustion**  
Explores the theories and fundamentals of how and why fires start, spread and how they are controlled.  
Lecture 3 hours per week.

→ **FST 112 | 3 credits**  
**Hazardous Materials Chemistry**  
Provides basic fire chemistry relating to the categories of hazardous materials including problems of recognition, reactivity, and health encountered by firefighters.  
Lecture 3 hours per week.

→ **FST 115 | 3 credits**  
**Fire Prevention**  
Provides fundamental information regarding the history and philosophy of fire prevention, organization and operation of a fire prevention bureau, use of fire codes, identification and correction of fire hazards, and the relationships of fire prevention with built-in fire protection systems, fire investigation, and fire and life-safety education.  
Lecture 3 hours per week.

→ **FST 120 | 3 credits**  
**Occupational Safety and Health for the Fire Service**  
Introduces the basic concepts of occupational health and safety as it relates to emergency service organizations. Includes risk evaluation and control procedures for fire stations, training sites, emergency vehicles, and emergency situations involving fire, EMS, hazardous materials, and technical rescue. Upon completion of this course, students should be able to establish and manage a safety program in an emergency service organization.  
Lecture 3 hours per week.
- **FST 121 | 3 credits**  
  **Principles of Fire and Emergency Services Safety and Survival**  
  Introduces basic principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavior change throughout the emergency services. Lecture 3 hours per week.

- **FST 135 | 3 credits**  
  **Fire Instructor I**  
  Emphasizes development of teaching methods and aids, including role-playing, small group discussion and development of individual learning methods and materials. Requires student to develop lesson plans and make presentations on appropriate topics. Based on current requirements of NFPA 1041, Standards for Fire Instructor Professional Qualifications, and prepares student for certification as Fire Instructor I. Lecture 3 hours per week.

- **FST 140 | 4 credits**  
  **Fire Officer I**  
  Presents a basic course to help individuals develop the skills needed to supervise and direct personnel, and manage resources at the company level; and is based on the current requirements of the NFPA 1021, Standards for Fire Officer Professional Qualifications. Prepares student for certification as Fire Officer I. Lecture 4 hours per week.

- **FST 205 | 3 credits**  
  **Fire Protection Hydraulics and Water Supply**  
  Provides a foundation of theoretical knowledge in order to understand the principles of the use of water in fire protection and to apply hydraulic principles to analyze and to solve water supply problems. Lecture 3 hours per week.

- **FST 210 | 3 credits**  
  **Legal Aspects of Fire Service**  
  Introduces the federal, state, and local laws that regulate emergency services, national standards influencing emergency services, standard of care, tort, liability, and a review of relevant court cases. Lecture 3 hours per week.

- **FST 215 | 3 credits**  
  **Fire Protection Systems**  
  Provides information relating to the features of design and operation of fire detection and alarm systems, heat and smoke control systems, special protection and sprinkler systems, water supply for fire protection and portable fire extinguishers. Lecture 3 hours per week.

- **FST 220 | 3 credits**  
  **Building Construction for Fire Protection**  
  Provides the components of building construction that relate to fire and life safety. Focuses on firefighter safety. Covers the elements of construction and design of structures and how they are key factors when inspecting buildings, preplanning fire operations, and operating at emergencies. Lecture 3 hours per week.

- **FST 230 | 3 credits**  
  **Fire Investigation**  
  Provides the student with the fundamentals and technical knowledge needed for proper fire scene interpretations, including recognizing and conducting origin and cause, preservation of evidence and documentation, scene security, motives of the fire setter, and types of fire causes. Lecture 3 hours per week.

- **FST 235 | 3 credits**  
  **Strategy and Tactics**  
  Provides an in-depth analysis of the principles of fire control through utilization of personnel, equipment, and extinguishing agents on the fire ground. Lecture 3 hours per week.

- **FST 237 | 3 credits**  
  **Emergency Service Supervision**  
  Teaches the history of modern management theories, including scientific management and behavioral scientist approach. Introduces concepts of group dynamics, leadership, communication, stress and time management, and personnel evaluation techniques. Discusses the legal and ethical considerations of personnel management in the emergency service. Lecture 3 hours per week.

- **FST 240 | 3 credits**  
  **Fire Administration**  
  Introduces the student to the organization and management of a fire department and the relationship of government agencies to the fire service. Emphasizes fire service leadership from the perspective of the company officer. Lecture 3 hours per week.

- **FST 245 | 3 credits**  
  **Fire and Risk Analysis**  
  Presents a study of current urban fire problems with emphasis on solutions based upon current available technology. Includes master planning, as well as methods of identifying, analyzing and measuring accompanying risk and loss possibilities. Prerequisite: FST 240. Lecture 3 hours per week.
→ **FST 250 | 3 credits**
  **Fire Officer II**
  Presents an intermediate-level course to help individuals further develop the skills needed to supervise and direct personnel, manage resources at the company level, and is based on the current requirements of the NFPA 1021, Standards for Fire Officer Professional Qualifications. Prepares student for certification as Fire Officer II. **Prerequisite:** FST 140 or certification as Fire Officer I. Lecture 3 hours per week.

→ **FRE 101-102 | 4 credits each**
  **Beginning French I-II**
  Introduces understanding, speaking, reading, and writing skills and emphasizes basic French sentence structure. **Prerequisite for FRE 102:** FRE 101 or 2 years of high school French. Lecture 4 hours per week. May include one additional hour of oral practice per week.

→ **FRE 203-204 | 3 credits each**
  **Intermediate French I-II**
  Continues to develop understanding, speaking, reading, and writing skills. **Prerequisite for FRE 203:** FRE 102 or 3 years of high school French. **Prerequisite for FRE 204:** FRE 203 or 4 years of high school French. Lecture 3 hours per week.

→ **FNS 110 | 2 credits**
  **Introduction to Funeral Service**
  Presents a comprehensive study of the history of funeral service, commencing with the practices of the Egyptians, early Christians, Romans, and Hebrews. Traces funeral practice from its early pagan origins to the modern practices of today. May include the study of the sociology of funeral service. **Prerequisite:** Admission into program or instructor permission. Lecture 2 hours per week.

→ **FNS 111 | 3 credits**
  **Theory of Embalming I**
  Introduces the purpose and historical background of embalming. Teaches the ethics and sanitary consideration in the handling of human remains, signs and tests of deaths, and postmortem changes in the body. **Prerequisite:** Admission into program or instructor permission. Co-requisite: FNS 113. Lecture 3 hours per week.

→ **FNS 112 | 3 credits**
  **Theory of Embalming II**
  Presents pre-embalming diagnosis, positioning the body and posing the features, linear and anatomical guides for selected blood vessels, and factors that influence fluid distribution and blood drainage. **Prerequisites:** Admission into program, FNS 111 and FNS 113. Co-requisite: FNS 114. Lecture 3 hours per week.

→ **FNS 113 | 1 credit**
  **Theory of Embalming Laboratory I**
  Teaches the basic procedures of embalming. Presents instruments, equipment, and the types of preservatives and disinfectant chemicals used in embalming. **Prerequisite:** Admission into program or instructor permission. Co-requisite: FNS 114. Laboratory 3 hours per week.

→ **FNS 114 | 1 credit**
  **Theory of Embalming Laboratory II**
  Teaches through practice and demonstration of various embalming techniques. May include clinical experiences in area funeral homes. **Prerequisites:** Admission into program, FNS 111 and FNS 113. Co-requisite: FNS 112. Laboratory 3 hours per week.

→ **FNS 121 | 3 credits**
  **Anatomy for Funeral Service I**
  Introduces anatomy and physiology and basic terminology. Presents information about wills, tissues, and organs. Discusses the reproductive, urinary, and endocrine body system. **Lecture 3 hours per week.**

→ **FNS 125 | 3 credits**
  **Microbiology for Funeral Service**
  Focuses on microscopic forms of life from a morphological, cultural, and staining viewpoint. Studies in detail causative agents of disease and their importance to a scientific approach to sanitation. Stresses the need for scientific knowledge concerning disease and its cause. **Prerequisite:** Admission into program or instructor permission. Lecture 3 hours per week.
→ **FNS 126 | 3 credits**  
*Pathology for Funeral Service*  
Introduces the general processes of disease, stressing their importance to the scientific embalmer and funeral director as health guardians. Studies diseases of specific organs and organ systems with emphasis on the significant structural changes involved and the embalming problems they present. **Prerequisite:** Admission into program or instructor permission. Lecture 3 hours per week.

→ **FNS 211 | 3 credits**  
*Restorative Art I*  
Presents surface contour; the influence of the bone structure on facial form; and the effect of the facial muscles on the wrinkles, grooves, and folds of the face. Teaches the treatments and techniques for restorations. Introduces wax and non-wax treatments such as swellings, feature corrections, and hair restoration. Studies lip-waxing techniques and the modeling of various forms of the mouth and eyes. Teaches the rudiments of cosmetic knowledge and techniques through lectures, demonstrations, and student participation. **Prerequisite:** Admission into program or instructor permission. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ **FNS 212 | 3 credits**  
*Restorative Art II*  
Studies color principles and their application to funeral work and the funeral establishment. Teaches the basic principles employed in recreating the personalized form and dimensions of each facial feature when restoration is necessary. Focuses on problem cases which require illusory corrections, matching wax color skin, and the masking of small and extensive discolorations. Teaches feature construction with restorative wax through demonstrations and laboratory practice. **Prerequisites:** Admission into program and FNS 211. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ **FNS 231 | 4 credits**  
*Principles of Funeral Management I*  
Introduces the basic social, religious, ethical, and psychological factors that influence funeral service. Teaches telephone techniques and etiquette and acceptable funeral terminology. Studies the various types of religious, fraternal, and military funeral services. **Prerequisite:** Admission into program or instructor permission. Lecture 4 hours per week.

→ **FNS 232 | 4 credits**  
*Principles of Funeral Management II*  
Teaches merchandising, the principles of buying and selling and the techniques of making funeral arrangements. Studies the construction and proper selection of casket, room arrangement, and Social Security and veterans’ benefits. Focuses on modern funeral establishment management techniques and procedures. **Prerequisites:** Admission into program and FNS 231. Lecture 4 hours per week.

→ **FNS 236 | 3 credits**  
*Funeral Service Law*  
Focuses on the duties, rights, responsibilities, and liabilities of the funeral director and embalmer. Teaches building and zoning ordinances relating to the funeral establishment, tort liability, cemetery law, wills, and the administration of estates. May include the study of state laws as they pertain to funeral services. **Prerequisite:** Admission into program or instructor permission. Lecture 3 hours per week.

→ **FNS 270 | 3 credits**  
*Funeral Service Review*  
Prepares the student for national and state licensing examination in funeral service. Reviews all materials that will be covered by funeral service licensing examinations. Teaches modern test-taking techniques. Requires the writing of a detailed outline of one funeral service subject which determines the final grade. This is a capstone course designed to prepare students for the National Board Examination (NBE). Completion of the NBE is a requirement for successful completion of this course. FEE: $350/$400 for National Board Exam. **Prerequisite:** Admission into program or instructor permission. Lecture 3 hours per week.

**GEOGRAPHICAL INFORMATION SYSTEMS**

→ **GIS 101 | 3 credits**  
*Introduction to Geospatial Technology I*  
Provides an introduction to the concepts of Geographic Information Systems (GIS), Global Positioning Systems, (GPS) and remote sensing components of Geospatial Technology. Teaches the introductory concepts of geographic location and problem solving by using GIS and GPS units in demonstrating solutions to cross-curricular applications of the technology. **Prerequisite:** ITE 115. Lecture 3 hours per week.
→ GIS 200  |  4 credits
**Geographical Information Systems I**
Provides hands-on introduction to a dynamic desktop GIS (Geographic Information System). Introduces the components of a desktop GIS and their functionality. Emphasizes manipulation of data for the purpose of analysis, presentation, and decision-making. Prerequisite: ITE 115, ITE 119 or equivalent. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ GIS 201  |  4 credits
**Geographical Information Systems II**
Provides a continuation of GIS 200, with emphasis on advanced topics in problem solving, decision-making, modeling, programming, and data management. Covers map projections and data formats, and methods for solving the problems they create. Prerequisite: GIS 200. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ GIS 203  |  4 credits
**Cartography for GIS**
Focuses on the fundamental cartographic concepts used in planning, designing, and creating effective maps. Provides the foundation to critically evaluate maps to produce accurate and visually pleasing cartographic displays that convey information in a manner that enables easy interpretation. Includes topics of map compilation, map design, map types, and critical evaluation of map content. Prerequisite: GIS 200. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ GIS 205  |  4 credits
**GIS 3-Dimensional Analysis**
Introduces GIS 3D (three-dimensional) concepts and practices with a concentration on displaying, creating, and analyzing spatial GIS data using 3D. Covers 3D shape files, 3D data formats such as Tins, DEMs, grids, and controlling the perspective and scale of 3D data through rotating, panning, and zooming. Prerequisite: GIS 201. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ GIS 210  |  4 credits
**Understanding Geographic Data**
Provides the student an introduction to geographic data and the principles behind their construction. Introduces the concepts for measuring locations and characteristics of entities in the real world. Exposes the student to the limitations and common characteristics of geographic data. Prerequisite: GIS 201. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ GIS 215  |  4 credits
**New GIS Software Platforms and Applications**
Assists users with the transition to newer GIS software platforms and applications. Covers concepts and terminology needed to become proficient in the latest GIS software. Prerequisite: GIS 201. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ GIS 220  |  4 credits
**Introduction to Urban and Regional Planning**
Provides an overview of how GIS is used in urban and regional planning. Emphasizes the use of GIS software to address real world social, economic, and environmental planning problems. Prerequisite: GIS 201. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ GIS 230  |  3 credits
**GIS: Applications in Environmental Science**
Introduces Global Positioning Systems (GPS) and Geographic Information Systems (GIS) hardware and software and applies the principles of GPS and GIS to Forest Science and Environmental Science. Includes: Natural Disasters, Pest Control, Water Quality, Prescribed Burning, and Identifying Sources of Pollution. (This course covers the same content as ENV 230. Credit will not be granted for both courses). Prerequisite: GIS 200. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ GIS 255  |  4 credits
**Exploring our Earth: Introduction to Remote Sensing**
Introduces material to understand the fundamental physical and mathematical principles and techniques of Remote Sensing. Introduces how each part of the electromagnetic spectrum is used to gather data about Earth. Describes limitations imposed by satellites, aircraft, and sensors. Surveys various methods to access and apply Earth observation/Remote Sensing data. Teaches students to use Remote Sensing software to process and manipulate Landsat, SPOT, photographic, and other imagery in a hands-on approach to Remote Sensing analysis. Prerequisite: GIS 200. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.
GEOGRAPHY

→ GEO 210 | 3 credits
People and the Land: Introduction to Cultural Geography
Focuses on the relationship between culture and geography. Presents a survey of modern demographics, landscape modification, material and non-material culture, language, race and ethnicity, religion, politics, and economic activities. Introduces the student to types and uses of maps. Lecture 3 hours per week.

→ GEO 220 | 3 credits
World Regional Geography
Studies physical and cultural characteristics of selected geographical regions of the world. Focuses upon significant problems within each of the regions, and examines the geographical background of those problems. Introduces the student to types and uses of maps. Lecture 3 hours per week.

→ GEO 221 | 3 credits
Regions of the World I
Presents an overview of physical and cultural characteristics of selected geographical regions of the world. Focuses upon significant problems within each of the regions. Studies the European cultural sphere including Europe, Soviet Union, the Americas and Australia and the emerging nations in Africa, Southwest Asia and the Orient. Introduces the student to types and uses of maps. Lecture 3 hours per week.

GEOLOGY

→ GOL 105 | 4 credits
Physical Geology
Introduces the composition and structure of the earth and modifying agents and processes. investigates the formation of minerals and rocks, weathering, erosion, earthquakes, and crustal deformation. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ GOL 106 | 4 credits
Historical Geology
Traces the evolution of the earth and life through time. Presents scientific theories of the origin of the earth and life and interprets rock and fossil records. Prerequisite: GOL 105. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ GOL 110 | 4 credits
Earth Science
FOR NON-SCIENCE MAJORS. Examines the dynamics of the earth and its relation to the solar system. Applies the principles of geology, oceanography, meteorology and astronomy in a multi-disciplinary science environment. Stresses the effects of geologic processes on the environment. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ GOL 111-112 | 4 credits each
Oceanography I-II
Examines the dynamics of the oceans and ocean basins. Applies the principles of physical, chemical, biological, and geological oceanography. Prerequisite for GOL 112: GOL 111. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

GERMAN

→ GER 101-102 | 4 credits each
Beginning German I-II
Introduces understanding, speaking, reading, and writing skills and emphasizes basic German sentence structure. Prerequisite for GER 102: GER 101 or 2 years of high school German. Lecture 4 hours per week. May include one additional hour oral practice per week.

→ GER 201-202 | 3 credits each
Intermediate German I-II
Continues to develop understanding, speaking, reading, and writing skills. German is used in the classroom. Prerequisite for GER 201: GER 102 or 3 years of high school German. Prerequisite for GER 202: GER 201 or 4 years of high school German. Lecture 3 hours per week. May include one additional hour oral practice per week.
# HEALTH

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Description</th>
<th>Lecture Hours per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLT 100</td>
<td>3</td>
<td>First Aid and Cardiopulmonary Resuscitation</td>
<td>Focuses on the principles and techniques of safety, first aid, and cardiopulmonary resuscitation.</td>
<td>3</td>
</tr>
<tr>
<td>HLT 105</td>
<td>1</td>
<td>Cardiopulmonary Resuscitation</td>
<td>Provides training in coordinated mouth-to-mouth artificial ventilation and chest compression, choking, life-threatening emergencies, and sudden illness.</td>
<td>1</td>
</tr>
<tr>
<td>HLT 106</td>
<td>2</td>
<td>First Aid and Safety</td>
<td>Focuses on the principles and techniques of safety and first aid.</td>
<td>2</td>
</tr>
<tr>
<td>HLT 110</td>
<td>3</td>
<td>Concepts of Personal and Community Health</td>
<td>Studies the concepts related to the maintenance of health, safety, and the prevention of illness at the personal and community level.</td>
<td>3</td>
</tr>
<tr>
<td>HLT 116</td>
<td>3</td>
<td>Introduction to Personal Wellness Concepts</td>
<td>Introduces students to the dimensions of wellness including the physical, emotional, environmental, spiritual, occupational, and social components.</td>
<td>3</td>
</tr>
<tr>
<td>HLT 121</td>
<td>3</td>
<td>Introduction to Drug Use and Abuse</td>
<td>Explores the use and abuse of drugs in contemporary society with emphasis upon sociological, physiological and psychological effects of drugs.</td>
<td>3</td>
</tr>
<tr>
<td>HLT 125</td>
<td>3</td>
<td>Anatomy and Physiology for Exercise Science</td>
<td>Presents basic principles of human anatomy and physiology including the body structure, systems and functions. The course provides a foundation to build and apply concepts in the study of Exercise Science, Group Fitness, Personal Training, and related fitness studies.</td>
<td>3</td>
</tr>
<tr>
<td>HLT 130</td>
<td>1</td>
<td>Nutrition and Diet Therapy</td>
<td>Studies nutrients, sources, functions, and requirements with an introduction to diet therapy.</td>
<td>1</td>
</tr>
<tr>
<td>HLT 135</td>
<td>3</td>
<td>Child Health and Nutrition</td>
<td>Focuses on the physical needs of the preschool child and the methods by which these are met. Emphasizes health routines, hygiene, nutrition, feeding and clothing habits, childhood diseases, and safety as related to health, growth and development.</td>
<td>3</td>
</tr>
<tr>
<td>HLT 138</td>
<td>2</td>
<td>Principles of Nutrition</td>
<td>Studies nutrient components of food, including carbohydrates, fats, proteins, vitamins, minerals and water. Provides a behavioral approach to nutrient guidelines for the development, and maintenance of optimum wellness.</td>
<td>2</td>
</tr>
<tr>
<td>HLT 140</td>
<td>2</td>
<td>Orientation to Health Related Professions</td>
<td>Explores the interrelated roles and functions of various members of the health team. Focuses on understanding and working within the culture of healthcare for non-healthcare professionals in public health and private healthcare settings.</td>
<td>2</td>
</tr>
<tr>
<td>HLT 141</td>
<td>2</td>
<td>Introduction to Medical Terminology</td>
<td>Focuses on medical terminology for students preparing for careers in the health professions.</td>
<td>2</td>
</tr>
<tr>
<td>HLT 143-144</td>
<td>3 each</td>
<td>Medical Terminology I-II</td>
<td>Provides an understanding of medical abbreviations and terms. Includes the study of prefixes, suffixes, word stems, and technical terms with emphasis on proper spelling, pronunciation, and usage. Emphasizes more complex skills and techniques in understanding medical terminology. Prerequisite for HLT 144: HLT 143.</td>
<td>3</td>
</tr>
<tr>
<td>HLT 150</td>
<td>1</td>
<td>Cross Cultural Health and Wellness Practices</td>
<td>Explores prevailing cultural values toward health and wellness and compares them with cultures around the world. Presents concepts related to communication, spirituality, family and gender roles, dietary restrictions, traditional practices, reaction to pain, and end-of-life decisions.</td>
<td>1</td>
</tr>
</tbody>
</table>
→ HLT 155 | 2 credits
Current Issues and Health Care
Focuses on current issues in the health care industry. 
Prerequisite: Admission into program or instructor permission. Lecture 2 hours per week.

→ HLT 160 | 3 credits
Personal Health and Fitness
Studies the relationships between health and fitness. Topics include nutrition, disease prevention, weight control, smoking and health, medical care, aerobic and anaerobic conditioning, and the relationship between physical and mental health. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ HLT 200 | 3 credits
Human Sexuality
Provides a basic understanding of human sexuality. Includes anatomy, physiology, pregnancy, family planning, venereal diseases, and sexual variations. Lecture 3 hours per week.

→ HLT 204 | 3 credits
Women’s Health
Explores current issues related to women’s health and wellness with an emphasis upon prevention of disease and optimum well-being. Takes a multi-ethnic approach to exploring the most up-to-date findings, diagnostic tools, and treatments for breast cancer, reproductive tract illness, heart, and other common diseases faced by women from puberty through menopause. Lecture 3 hours per week.

→ HLT 215 | 3 credits
Personal Stress and Stress Management
Provides a basic understanding of stress and its physical, psychological, and social effects. Includes the relationships between stress and change, self-evaluation, sources of stress, and current coping skills for handling stress. Lecture 3 hours per week.

→ HLT 250 | 3 credits
General Pharmacology
Emphasizes general pharmacology for the health related professions covering general principles of drug actions/reactions, major drug classes, specific agent within each class, and routine mathematical calculations needed to determine desired dosages. Lecture 3 hours per week.

→ HLT 261 | 3 credits
Basic Pharmacy I
Explores the basics of general pharmacy, reading prescriptions, symbols, packages, pharmacy calculations. Teaches measuring compounds of drugs, dosage forms, drug laws, and drug classifications. Part I of II. Lecture 3 hours per week.

→ HLT 262 | 3 credits
Basic Pharmacy II
Explores the basics of general pharmacy, reading prescriptions, symbols, packages, pharmacy calculations. Teaches measuring compounds of drugs, dosage forms, drug laws, and drug classifications. Part II of II. Lecture 3 hours per week.

→ HLT 290 | 3 credits
Coordinated Internship
Supervises on-the-job training in selected business, industrial or service firms coordinated by the college. Lecture 15 hours per week.

-founded by HEALTH INFORMATION MANAGEMENT

→ HIM 101 | 4 credits
Health Information Technology I
Introduces values, uses and content of the medical record. Defines numbering, filing and retention policies and practices. Prerequisite: Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ HIM 103 | 2 credits
Health Information Technology II
Introduces principles of data quality and validation types and uses of health databases. Prerequisites: Admission into program and HIM 101. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ HIM 110 | 3 credits
Introduction to Human Pathology
Introduces the basic concepts, terminology, etiology and characteristics of pathological processes. Prerequisites: Admission into program, BIO 141 and HLT 143. Lecture 3 hours per week.
→ HIM 151  |  2 credits
Reimbursement Issues in Medical Practice Management
Introduces major reimbursement systems in the United States. Focuses on prospective payment systems, managed care, and documentation necessary for appropriate reimbursement. Emphasizes management of practice to avoid fraud. Prerequisites: Admission into program and instructor permission. Lecture 2 hours per week.

→ HIM 215  |  5 credits
Health Data Classification Systems
Focuses on disease and procedure classification systems currently utilized for collecting health data for the purposes of statistical research and financial reporting. Prerequisites: Admission into program and instructor permission. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

→ HIM 220  |  2 credits
Health Statistics
Introduces the student to basic statistical principles and calculations as applied in the health care environment, procedures for collection and reporting vital statistics, and quality control basics. Prerequisite: Admission into program. Lecture 2 hours per week.

→ HIM 226  |  2 credits
Legal Aspects of Health Record Documentation
Presents the legal requirements associated with health record documentation. Emphasizes the policies and procedures concerning the protection of the confidentiality of patient's health records. Prerequisite: Admission into program. Lecture 2 hours per week.

→ HIM 229  |  2 credits
Performance Improvement in Health Care Settings
Focuses on concepts of facility wide performance improvement, resource management, and risk management. Applies tools for data collection and analysis. Prerequisites: Admission into program and HIM 101. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ HIM 230  |  3 credits
Information Systems and Technology in Health Care
Explores computer technology and system application in health care. Introduces the information systems life cycle. Prerequisites: Admission into program and instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ HIM 249  |  3 credits
Supervision and Management Practices
Introduces supervision and management principles with emphasis on the application of these principles in the health information setting. Prerequisites: Admission into program and HIM 101. Lecture 3 hours per week.

→ HIM 253  |  4 credits
Health Records Coding
Examines the development of coding classification systems. Introduces ICD-9-CM coding classification system, its format and conventions. Stresses basic coding steps and guidelines according to body systems. Provides actual coding exercises in relation to each system covered. Prerequisites: Admission into program and BIO 141. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ HIM 254  |  4 credits
Advanced Coding and Reimbursement
Stresses advanced coding skills through practical exercises using actual medical records. Introduces CPT-4 coding system and guidelines for out-patient/ambulatory surgery coding. Introduces prospective payment system and its integration with ICD-9-CM coding. Prerequisites: Admission into program and instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ HIM 260  |  2 credits
Pharmacology for Health Information Technology
Emphasizes general pharmacology for Health Information professionals; covers general principles of drug actions/reactions, major drug classes, specific agents within each class, and routine mathematical calculation needed to determine desired dosages. Prerequisites: Admission into program, BIO 141 and HLT 143. Lecture 2 hours per week.

→ HIM 290  |  3 credits
Coordinated Internship in Health Information Management
Supervises on-the-job training in selected business, industrial or service firms coordinated by the college. Credit/practice ratio not to exceed 1:5 hours. May be repeated for credit. Lecture 3 hours per week.

→ HIM 298  |  2 credits
Seminar and Project in Health Information Management
Introduces the student to information management practices, regulatory issues, reimbursement, utilization management, risk management and quality improvement initiatives as it pertains to nontraditional health care settings. Lecture 2 hours per week.
HEALTH INFORMATION TECHNOLOGY

→ HIT 230 | 3 credits
  Computer Applications in Health Care
  Covers systems planning, acquisition, implementation, technology support, strategic planning and governance; as well as threats to security of health information. Covers the value and organization of health care information systems (IS) and the role of the Information Technology (IT) Department. Lecture 3 hours per week.

→ HIT 233 | 3 credits
  Working with Electronic Health Records
  Provides an in depth analysis of the electronic health record (EHR). Explores the features of EHRs as they relate to practical deployment in the health care setting. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

HISTORY

→ HIS 101-102 | 3 credits each
  History of Western Civilization I-II
  Examines the development of western civilization from ancient times to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 111-112 | 3 credits each
  History of World Civilization I-II
  Surveys Asian, African, Latin American, and European civilizations from the ancient period to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 121-122 | 3 credits each
  United States History I-II
  Surveys United States history from its beginning to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 141-142 | 3 credits each
  African-American History I-II
  Surveys the history of black Americans from their African origins to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 155 | 3 credits
  Life in Colonial Virginia
  Studies life in Virginia before the American Revolution, including politics, economics, customs, culture, and the slave plantation system. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 162 | 3 credits
  United States History in Film
  Examines selected topics in the United States history which shaped the American experience, presented in film. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 169 | 3 credits
  Civil War and Reconstruction
  Studies factors that led to the division between the States. Examines the war, the home fronts, and the era of Reconstruction. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 176 | 3 credits
  United States History Since World War II
  Investigates United States history from 1945 to the present, studying both domestic developments and American involvement in international affairs. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 180 | 3 credits
  American Foreign Policy Since 1890
  Examines American foreign policy since 1890 with an emphasis on current events and diverse points of view. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

→ HIS 181 | 3 credits
  History of Virginia I
  Examines the cultural, political, and economic history of the Commonwealth from its beginning to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.
HORTICULTURE

- **HRT 110 | 3 credits**  
  **Principles of Horticulture**  
  Introduces concepts of plant growth and development. Covers horticultural practices, crops and environmental factors affecting plant growth. **Lecture 3 hours per week.**

- **HRT 115 | 3 credits**  
  **Plant Propagation**  
  Teaches principles and practices of plant propagation. Examines commercial and home practices. Provides experience in techniques using seed-spores, cuttings, grafting, budding, layering, and division. **Prerequisite: HRT 110. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 121-122 | 3 credits each**  
  **Greenhouse Crop Production I-II**  
  Covers commercial practices related to production of floriculture crops. Considers production requirements, environmental control and management, and cultural techniques. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 125 | 3 credits**  
  **Chemicals in Horticulture**  
  Emphasizes basic chemical principles and their application to horticulture. Introduces principles of inorganic and organic chemicals. Studies chemical activities of insecticides, fungicides, herbicides, fertilizers, and growth regulators. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 150 | 3 credits**  
  **Theory of Landscape Design**  
  Presents the theoretical aspects of landscape planning and design. Uses theory to analyze and solve design problems. **Prerequisite: HRT 235. Lecture 3 hours per week.**

- **HRT 155 | 3 credits**  
  **Plants and Society**  
  Covers the relationship between plants and people and the uses of plants as sources of food, medicine, drugs, spices, beverages, poisons, fibers, oils and plants exudates. **Prerequisite: HRT 110. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 201-202 | 3 credits each**  
  **Landscape Plants I-II**  
  Studies landscape use of plants. Considers ornamental value, growth habit, identification, and limitations. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 207 | 3 credits**  
  **Plant Pest Management**  
  Teaches principles of plant pest management. Covers morphology and life cycles of insects and other small animal pests and plant pathogens. Laboratory stresses diagnosis, chemical and non-chemical control of specific pests, and pesticide safety. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 226 | 3 credits**  
  **Professional Landscape Management**  
  Discusses the theoretical and applied practices of managing a greenhouse facility. Emphasizes greenhouse construction and design, environmental control, energy conservation, and related topics. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 227 | 3 credits**  
  **Greenhouse Management**  
  Focuses on basic practices and techniques involving landscape management. Includes development of a year-round management calendar and preparation of bids and contract proposals. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 231 | 3 credits**  
  **Planting Design I**  
  Applies landscape theory and principles of drawing to the planning of residential and small scale commercial landscape designs. **Prerequisites: HRT 235 and HRT 201 or HRT 202. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

- **HRT 233 | 3 credits**  
  **Landscape Drawing Applications**  
  Applies theories of landscape design and drawing to actual design projects and tasks. Emphasizes drawing techniques and use of advanced media in applications. Includes hand line, free-style, and computer-assisted landscape drawing in simple landscape drawing applications. **Prerequisites: HRT 150 and HRT 235 and HRT 201 or HRT 202. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRT 235</td>
<td>3</td>
<td>Landscape Drawing</td>
<td>Teaches students the use of drafting equipment. Emphasizes drawing techniques and use of media. Includes hard line and free-style landscape drawing. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.</td>
</tr>
<tr>
<td>HRT 259</td>
<td>3</td>
<td>Arborculture</td>
<td>Studies the techniques of tree care. Covers surgery, pruning, insect and disease recognition and control, fertilization, cabling, and lightning rod installation. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.</td>
</tr>
<tr>
<td>HRT 269</td>
<td>3</td>
<td>Professional Turf Care</td>
<td>Covers turfgrass identification selection, culture, propagation, and pest control. Surveys commercial turf care operations and use of common equipment. Lecture 2 hours. Laboratory 2 hours. Total 4 hour per week.</td>
</tr>
<tr>
<td>HRT 275</td>
<td>3</td>
<td>Landscape Construction and Maintenance</td>
<td>Examines practical applications of commercial landscape construction techniques and materials used. Covers construction, planting, and maintenance. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.</td>
</tr>
<tr>
<td>HRT 298</td>
<td>2</td>
<td>Seminar and Project</td>
<td>Requires completion of a project or research report related to the student's occupational objectives and a study of approaches to the selection and pursuit of career opportunities in the field. Prerequisite: Instructor permission. Lecture 2 hours per week.</td>
</tr>
<tr>
<td>HRI 101-102</td>
<td>3</td>
<td>Hotel-Restaurant Organization and Management I-II</td>
<td>Introduces the history, opportunities, problems and trends of the hospitality industry. Covers the organization of the various sectors of the hospitality industry including human resources, general business considerations, and management theory. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>HRI 103</td>
<td>3</td>
<td>Introduction to Meeting Planning</td>
<td>Focuses on basic aspects and skills involved in planning and managing meetings, exhibitions, events, and conventions. Covers the entire spectrum of the meetings industry, treating all aspects with a broad approach. Emphasizes types of meetings, meeting markets, industry suppliers and affiliates, budget and program planning, site selection and legal issues, registration and housing, and the development of timelines. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>HRI 106-107</td>
<td>3</td>
<td>Principles of Culinary Arts I-II</td>
<td>Introduces the fundamental principles of food preparation and basic culinary procedures. Stresses the use of proper culinary procedures combined with food science, proper sanitation, standards of quality for food items that are made, and proper use and care of kitchen equipment. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.</td>
</tr>
<tr>
<td>HRI 119</td>
<td>3</td>
<td>Applied Nutrition for Food Service</td>
<td>Studies food composition, nutrition science, and application of nutrition principles by the food service professional. Provides the student with a basic understanding of human nutrition and application of nutrition in the service of commercially prepared meals. Lecture 3 hours per week.</td>
</tr>
<tr>
<td>HRI 128</td>
<td>3</td>
<td>Principles of Baking</td>
<td>Instructs the student in the preparation of breads, pastries, baked desserts, candies, frozen confections, and sugar work. Applies scientific principles and techniques of baking. Promotes the knowledge/skills required to prepare baked items, pastries and confections. Prerequisites: HRI 106 and/or HRI 107. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.</td>
</tr>
<tr>
<td>HRI 134</td>
<td>3</td>
<td>Food and Beverage Service Management</td>
<td>Provides a conceptual and technical framework for managing the service of meals in a variety of commercial settings. Studies the integration of production and service delivery, guest contact dynamics, reservations management and point-of-sale systems. Prerequisite: HRI 158. Lecture 3 hours per week.</td>
</tr>
</tbody>
</table>
→ **HRI 145 | 3 credits**  
**Garde Manger**  
Studies garde manger, the art of decorative cold food preparation and presentation. Provides a detailed practical study of cold food preparation and artistic combination and display of cold foods. **Prerequisites: HRI 206 and/or HRI 207. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **HRI 150 | 3 credits**  
**Introduction to Hospitality Ownership**  
Presents growth, development, present status and trends of the food and lodging industry. Includes special problems of operating small and medium sized establishments. Introduces credit and accounting procedures, management of staff, marketing, advertising, and security, as well as personal attitudes, qualifications, and ethics. **Lecture 3 hours per week.**

→ **HRI 154 | 3 credits**  
**Principles of Hospitality Management**  
Presents basic understanding of the hospitality industry by tracing the industry's growth and development, reviewing the organization and management of lodging, food, and beverage operations, and focusing on industry opportunities and future trends. **Lecture 3 hours per week.**

→ **HRI 158 | 3 credits**  
**Sanitation and Safety**  
Covers the moral and legal responsibilities of management to insure a sanitary and safe environment in a food service operation. Emphasizes the causes and prevention of foodborne illnesses in conformity with federal, state and local guidelines. Focuses on OSHA standards in assuring safe working conditions. **Lecture 3 hours per week.**

→ **HRI 159 | 4 credits**  
**Introduction to Hospitality Industry Computer Systems**  
Familiarizes students with computerized information technology to manage information, support decision-making and analysis, improve processes, increase productivity and enhance customer service in the hospitality industry. **Prerequisite: ITE 115. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.**

→ **HRI 160 | 3 credits**  
**Executive Housekeeping**  
Studies the housekeeping department with emphasis on organization, staffing and scheduling, staff development, work methods improvements, equipment, cleaning materials and cleaning procedures, maintenance and refurbishing, room design and safety engineering. **Lecture 3 hours per week.**

→ **HRI 180 | 3 credits**  
**Convention Management and Service**  
Examines the scope and different segments that make up the convention market, explains what is required to meet individual needs, and explores methods and techniques for better service. **Lecture 3 hours per week.**

→ **HRI 205 | 3 credits**  
**Fundamentals of Wine**  
Familiarizes the student with basic knowledge needed to make decisions relative to the purchase, storage, and service of wine, as well as decisions relative to the use of wine in the hospitality and food service industry. **Lecture 3 hours per week.**

→ **HRI 206 | 3 credits**  
**International Cuisine**  
Introduces the concepts of cultural differences and similarities and the preparation of the food specialties of the major geographical areas of the world. Focuses on emerging cuisines as they become popular. **Prerequisites: HRI 106 and/or HRI 107. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **HRI 207 | 3 credits**  
**American Regional Cuisine**  
Studies the distinct regional cooking styles of America and its neighbors. Emphasizes the indigenous ingredients as well as the cultural aspect of each region's cooking style. Includes the preparation of the various regional foods. **Prerequisites: HRI 106 and/or HRI 107. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **HRI 215 | 3 credits**  
**Food Purchasing**  
Presents the method and procedures for purchasing food for hotels, restaurants and institutions. Deals with markets, federal and trade grades, governmental regulations, packaging, comparative versions price buying, yields and quality control. **Lecture 3 hours per week.**

→ **HRI 224 | 3 credits**  
**Recipe and Menu Management**  
Presents a comprehensive framework for creating and evaluating recipes and menus for commercial and non-commercial food service operations. Requires students to use microcomputer software to design recipes, recipe files, and menus. Teaches students menu engineering analysis and methods for optimizing menu contribution margin. **Lecture 3 hours per week.**
→ HRI 235  |  3 credits
Marketing of Hospitality Services
Studies principles and practices of marketing the services of the hotel and restaurant industry. Emphasizes the marketing concept with applications leading to customer satisfaction. Reviews methods of external and internal stimulation of sales. May include a practical sales/marketing exercise and computer applications. **Lecture 3 hours per week.**

→ HRI 241  |  3 credits
Supervision in the Hospitality Industry
Provides a comprehensive review of considerations for preparing students to become effective supervisors in restaurants and lodging operations. **Prerequisite: HRI 154. Lecture 3 hours per week.**

→ HRI 251  |  3 credits
Food and Beverage Cost Control I
Presents methods of pre-cost and pre-control as applied to the menu, purchasing, receiving, storing, issuing, production, sales and service which result in achievement of an operation's profit potential. Emphasizes both manual and computerized approaches. **Prerequisite: MTH 121 or higher. Lecture 3 hours per week.**

→ HRI 255  |  3 credits
Human Resource Management and Training for Hospitality and Tourism
Prepares the students for interviewing, training and developing employees. Covers management skills (technical, human, and conceptual) and leadership. Covers the establishment and use of effective training and evaluative tools to improve productivity. Emphasizes staff and customer relations. **Lecture 3 hours per week.**

→ HRI 256  |  3 credits
Principles and Applications of Catering
Analyzes and compares the principles of on-premise and off-premise catering. Includes student presentations in a series of catered functions where they assume typical managerial/employee positions emphasizing planning, organizing, operating, managing and evaluating. **Prerequisites: HRI 106, HRI 158 and MTH 121 or higher. Lecture 3 hours per week.**

→ HRI 257  |  3 credits
Catering Management
Studies special functions in the hospitality industry. Presents lecture and demonstration in banquet layout, menus, services, sales and supervision. **Lecture 3 hours per week.**

→ HRI 265  |  3 credits
Hotel Front Office Operations
Analyzes hotel front office positions and the procedures involved in reservation registration, accounting for and checking out guests, and principles and practices of night auditing. Covers the complete guest operation in both traditional and computerized operations. **Lecture 3 hours per week.**

→ HRI 270  |  3 credits
Strategic Lodging Management
Presents lodging management principles, focusing on strategic planning as the foundation for operational effectiveness. Synthesizes management practices which can be used by entry-level, mid-level, and executive management. **Lecture 3 hours per week.**

→ HRI 275  |  3 credits
Hospitality Law
Studies legal principles governing hospitality operations. Includes applications of common law and statutory decisions, discussion of legal theory, and regulations governing management of hospitality enterprise. **Lecture 3 hours per week.**

→ HRI 280  |  3 credits
Principles of Advanced Baking and Pastry
Reviews foundation principles of classical and modern baking/pastry methods. **Prerequisite: HRI 128 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ HMS 100  |  3 credits
Introduction to Human Services
Introduces human service agencies, roles and careers. Presents an historical perspective of the field as it relates to human services today. Additional topics include values clarification and needs of target populations. **Lecture 3 hours per week.**
→ **HMS 121 | 3 credits**  
**Basic Counseling Skills I**  
Develops skills needed to function in a helping relationship. Emphasizes skills in attending, listening and responding. Clarifies personal skill strengths, deficits and goals for skill improvement. **Prerequisite: HMS 100. Lecture 3 hours per week.**

→ **HMS 141 | 3 credits**  
**Group Dynamics I**  
Examines the stages of group development, group dynamics, the role of the leader in a group, and recognition of the various types of group processes. Discusses models of group dynamics that occur as a result of group membership dynamics. **Prerequisite: HMS 100. Lecture 3 hours per week.**

→ **HMS 226 | 3 credits**  
**Helping Across Cultures**  
Provides an historical overview of selected cultural and racial groups. Promotes understanding of group differences and the impact on counseling services. **Lecture 3 hours per week.**

→ **HMS 227 | 3 credits**  
**The Helper as a Change Agent**  
Teaches the following skills for implementing alternative models of change and influence: action research, problem-solving, consultation, workshop development, and outreach and advocacy for diverse client populations. **Lecture 3 hours per week.**

→ **HMS 236 | 3 credits**  
**Gerontology**  
Examines the process of aging; its implications in relation to health, recreation, education, transportation, meaningful work or activity, and to community resources. Emphasizes experiencing the aging process, facilitating retirement, and application of the helping relationship to work with older adults. **Lecture 3 hours per week.**

→ **HMS 250 | 3 credits**  
**Principles of Case Management**  
Provides an overview of current case management theory and practice in the field of mental health. **Prerequisite: HMS 100. Lecture 3 hours per week.**

→ **HMS 258 | 3 credits**  
**Case Management and Substance Abuse**  
Focuses on the process for interviewing substance abuse clients. Includes intake, assessment, handling denial, and ending the interview. Teaches skills for writing short-term goals and treatment plans with emphasis on accountability. Examines various reporting devices. **Prerequisite: HMS 100. Lecture 3 hours per week.**

→ **HUM 201 | 3 credits**  
**Survey of Western Culture I**  
Studies thought, values, and arts of Western culture, integrating major developments in art, architecture, literature, music, and philosophy. Covers the following periods: Ancient and Classical, Early Christian and Byzantine, Medieval, and Early Renaissance. **Lecture 3 hours per week.**

→ **HUM 202 | 3 credits**  
**Survey of Western Culture II**  
Studies thought, values, and arts of Western culture, integrating major developments in art, architecture, literature, music, and philosophy. Covers the following periods: Renaissance, Baroque, Enlightenment, Romantic, and Modern. **Lecture 3 hours per week.**

→ **HUM 220 | 3 credits**  
**Introduction to African-American Studies**  
Presents an interdisciplinary approach to the study of African-American life, history, and culture. Examines specific events, ideologies, and individuals that have shaped the contours of African-American life. Studies the history, sociology, economics, religion, politics, psychology, creative productions, and culture of African-Americans. **Lecture 3 hours per week.**

→ **HUM 241 | 3 credits**  
**Interdisciplinary Principles of the Humanities I**  
Integrates unifying principles of the humanities and related fields of study. Emphasizes the expansion of student's intellectual perspective and development of concepts enabling the integration of knowledge from diverse fields into a unified whole. **Lecture 3 hours per week.**
→ **HUM 246 | 3 credits**  
Creative Thinking  
Examines and analyzes creative and effective thinking processes with applications in individual and group projects to solve business, scientific, environmental, and other practical problems. *Lecture 3 hours per week.*

→ **HUM 247 | 3 credits**  
Chronicles of the Sea  
Studies the ocean and man’s relationship with it. Covers the study of selected readings about the sea from a literary, historical and social/political perspective. May include field trips, reports, and a sea voyage. *Lecture 3 hours per week.*

→ **HUM 256 | 3 credits**  
Mythology in Literature and the Arts  
Studies cultural expressions of mythology in literature and the arts. Considers several of the following mythologies, with emphasis on parallels and divergencies: Egyptian, Near-Eastern, Greek, Roman, Celtic, Norse, Asian, and African. *Lecture 3 hours per week.*

→ **HUM 259 | 3 credits**  
Greek Mythology  
Surveys and analyzes major stories from Greek Mythology. Explores psychological, anthropological, and historical interpretations of the myths. Acquaints students with recurring mythological themes in language, art, music, and literature. *Lecture 3 hours per week.*

→ **HUM 260 | 3 credits**  
Survey of Twentieth-Century Culture  
Explores literature, visual arts, philosophy, music, and history of our time from an interdisciplinary perspective. *Lecture 3 hours per week.*

→ **IND 101-102 | 3 credits each**  
Quality Assurance Technology I-II  
Studies principles and techniques of quality engineering for the management, design engineering economics, production, and assurance of quality. Emphasizes fundamentals of total quality assurance for product and process control. May include design review, fundamentals of statistics procurement control, sampling and control chart systems, quality reporting, process capability analysis, tool and gauge control, document control, or troubleshooting quality control. *Lecture 3 hours per week.*

→ **IND 105 | 3 credits**  
Nondestructive Inspection (NDI) and Testing  
Studies nondestructive inspection and testing methods as they relate to industry. May include radiographic (RT), ultrasonic (UT), eddy current (ET), magnetic particle (MT), and liquid penetrant (PT) or other methods of testing. *Lecture 3 hours per week.*

→ **IND 106 | 3 credits**  
Industrial Engineering Technology  
Introduces basic skills required for a career in industrial engineering technology. Includes basic statistics for engineering technicians, the SI system, graphic analysis, and careers as an industrial engineering technician. *Lecture 3 hours per week.*

→ **IND 113 | 3 credits**  
Materials and Processes in Manufacturing I  
Studies materials and processes for the manufacture of products. Investigates the nature of various materials. Examines the manufacturing processes of industry and their effects on materials. *Lecture 3 hours per week.*

→ **IND 115 | 4 credits**  
Materials and Processes of Industry  
Studies materials and processes for the manufacture of products. Investigates the nature of various materials. Examines the manufacturing processes of industry and their effects on materials. *Lecture 4 hours per week.*

→ **IND 121 | 3 credits**  
Industrial Supervision I  
Introduces the concept of the Supervisor as a Leader. Discusses the role of the Industrial Supervisor in the face of technology advances. Discusses the role of the Industrial Supervisor in leading organizational change and helping employees through transitions. Defines leadership styles and the selection of the appropriate style. Introduces the Industrial Supervisor as a motivator in terms of job satisfaction, morale, job design competition, communication, and promotions. Presents ethical behavior and dilemmas in organizations. *Lecture 3 hours per week.*
→ **IND 122 | 3 credits**  
*Industrial Supervision II*

Introduces the concept of the Supervisor as a Manager. Discusses the primary management functions and the differences between supervision and management. Discusses the planning process and scheduling techniques. Introduces concepts in organizing both formally and informally, accountability, span of control and delegation. Discusses the staffing process including legal considerations, forecasting, job analysis techniques, recruiting, interviewing and selection. Introduces the control process including what the Industrial Supervisor should control, control strategies, and how to control costs. Defines the decision making process and how to use employees, information and creativity in decision making. **Lecture 3 hours per week.**

→ **IND 135 | 3 credits**  
*Standards of Quality and Auditing*

Presents general requirements of industrial, military and international quality standards. Reviews quality audit principles relative to products, processes and systems. Includes the design of an approach to the audit and audit standards, procedures, methods, facilities control, personnel, and reporting methods. Includes case studies and in-plant audits. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **IND 137 | 3 credits**  
*Team Concepts and Problem Solving*

Studies team concepts and problem solving techniques to assist project teams in improving quality and productivity. Provides knowledge of how to work as a team, plan and conduct good meetings, manage logistics and details, gather useful data, communicate the results and implement changes. **Lecture 3 hours per week.**

→ **IND 142 | 3 credits**  
*Biometrics and Technology*

Teaches the fundamentals of leading biometric technologies including an explanation of how various biometric technologies work, how they are most effectively deployed, and current association of biometrics within current technologies. **Lecture 3 hours per week.**

→ **IND 145 | 3 credits**  
*Introduction to Metrology*

Studies principles of measurement and calibration control, application of statistics to measurement processes, and standards of measurements in calibration. May include the use of gauges and instruments in modern production and dimensional control concepts. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **IND 146 | 3 credits**  
*Statistical Quality Control*

Studies essentials and application of statistics in quality control function. May include definitions and uses of averages, standard deviations, ranges, and sampling plans. May discuss dependent and independent variables and distribution probabilities. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **IND 150 | 3 credits**  
*Industrial Management*

Studies planning, organizing, directing, and influencing industrial activities. May include research, product design, methods and time management, quality assurance and current manufacturing methodologies. **Lecture 3 hours per week.**

→ **IND 160 | 3 credits**  
*Introduction to Robotics*

Studies evolution and history of robotics with an emphasis on automated and flexible manufacturing. Presents advantages and limitations of present robot systems. **Lecture 3 hours per week.**

→ **IND 165 | 4 credits**  
*Principles of Industrial Technology I*

Introduces principle concepts of technology involving mechanical, fluid, electrical, and thermal power as they relate to force, work, and rate. **Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.**

→ **IND 166 | 4 credits**  
*Principles of Industrial Technology II*

Introduces principle concepts of technology involving mechanical, fluid, electrical, and thermal power as they relate to resistance, energy, power, and force transformers. Places an emphasis on mechanical and advantage systems. **Prerequisite: IND 165. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.**

→ **IND 216 | 3 credits**  
*Plant Layout and Materials Handling*

Examines arrangement and layout of physical facilities. Explains material handling and modern techniques for efficient utilization of space. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**
→ IND 236 | 3 credits  
Total Quality Concepts
Discusses the fundamentals of Total Quality. Compares and contrasts the philosophies of the recognized experts on the subject. Discusses cultural change, continuous process improvement, and strategic planning. Introduces team skills and concepts. Emphasizes the systems approach to Total Quality philosophy. Lecture 3 hours per week.

→ IND 237 | 3 credits  
Fundamentals of ISO 9000
Presents the basics of ISO 9000 standards. Focuses on the latest improvements of the standards and the redesigned quality concepts set forth by the International Organization for Standardization (ISO). Includes a historical overview of the evolution of quality systems and explains the purpose of ISO quality systems certification. Discusses implementation approaches. Lecture 3 hours per week.

→ IND 245 | 3 credits  
Time and Motion Study
Studies principles and applications of motion analysis, process, operations, and micro-motion study; methods improvement, work simplification, standardization, rating, allowance and analysis of time data. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ IND 251 | 3 credits  
Automated Manufacturing Systems I
Presents basic principles used in the design and implementation in manufacturing work cells. Includes selection of the robot system, worksite, application cell sensors, development of cycle times, and economic analysis. Prerequisite: Divisional approval. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ ITD 110 | 4 credits  
Web Page Design I
Stresses a working knowledge of website designs, construction, and management using HTML or XHTML. Includes headings, lists, links, images, image maps, tables, forms, and frames. Lecture 4 hours per week.

→ ITD 112 | 4 credits  
Designing Web Page Graphics
Explores the creation of digital graphics for web design. Explores basic design elements such as color and layout utilizing a computer graphics program(s). Lecture 4 hours per week.

→ ITD 132 | 4 credits  
Structured Query Language
Incorporates a working introduction to commands, functions and operators used in SQL for extracting data from standard databases. Lecture 4 hours per week.

→ ITD 134 | 4 credits  
PL/SQL Programming
Presents a working introduction to PL/SQL programming within the Oracle RDBMS environment. Includes PL/SQL fundamentals of block program structure, variables, cursor and exception handling, and creation of program units of procedures, functions, triggers and packages. Prerequisite: ITD 132. Lecture 4 hours per week.

→ ITD 136 | 4 credits  
Database Management Software
Covers an introduction to relational database theory and how to administer and query databases using multiple commercial database systems. Prerequisite: ITD 132. Lecture 4 hours per week.

→ ITD 152 | 4 credits  
Oracle Forms Developer
Provides a working introduction to building and testing interactive Oracle applications. Includes customizing forms with user input items such as check boxes, list items, and radio groups for use in a graphical user interface (GUI) environment. Includes modification of data access by creating event-related triggers. Prerequisite: ITD 134. Lecture 4 hours per week.

→ ITD 210 | 4 credits  
Web Page Design II
Incorporates advanced techniques in website planning, design, usability, accessibility, advanced site management, and maintenance utilizing web editing software(s). Prerequisite: ITD 110. Lecture 4 hours per week.
→ ITD 212 | 4 credits
Interactive Web Design
Provides techniques in interactive design concepts to create cross-platform, low-bandwidth animations utilizing a vector based application. Emphasizes the importance of usability, accessibility, optimization and performance. Note: Students should be proficient in graphic image creation and manipulation. Prerequisite: ITD 112. Lecture 4 hours per week.

→ ITD 250 | 4 credits
Database Architecture and Administration
Involves in-depth instruction about the underlying architecture of databases and the handling of database administration. Prerequisite: ITD 132. Lecture 4 hours per week.

→ ITD 251 | 3 credits
Database System Development
Provides the student the opportunity to solve a business problem from identification of the problem through the logical design and implementation on a database. Makes use of the knowledge that was gained in the prerequisite courses. Prerequisites: ITD 250 and ITD 260. Lecture 3 hours per week.

→ ITD 252 | 3 credits
Database Backup and Recovery
Concentrates instruction in the key tasks required to plan and implement a database backup and recovery strategy. Includes instruction in multiple strategies to recover from multiple types of failure. Prerequisite: ITD 250. Lecture 3 hours per week.

→ ITD 258 | 4 credits
Database Performance and Tuning
Emphasizes instruction to optimize the performance of a database management system. Includes methods for tuning data access and storage and discussions of resolving data performance problems. Prerequisite: ITD 250. Lecture 4 hours per week.

→ ITD 260 | 4 credits
Data Modeling and Design
Introduces life cycle application development methodologies in a systematic approach to developing relational databases and designing applications. Presents content introducing functional and business process modeling, using modeling information to produce application designs, analyzing data requirements as entities, attributes, and relationships and map an entity relationship diagram to an initial database design. Identifies the available automated development tools and utilizes Oracle Developer software to perform practical applications of these concepts. Prerequisite or co-requisite: ITD 132. Lecture 4 hours per week.

### INFORMATION TECHNOLOGY ESSENTIALS

→ ITE 55 | 1 credit
Certification Preparation
Serves as a review of objectives for a specific certification. Uses certification test preparation software, when available, in conjunction with a faculty resource person. May be repeated for credit. Lecture 1 hour per week.

→ ITE 95 | 1 credit
Using Your Digital Camera and Your Computer I
Introduces the student to the use of the digital camera, including how to use it with a computer to save, print, and edit photographs and how to share digital photographs on the computer and on the internet. Lecture 1 hour per week.

→ ITE 95 | 1 credit
Introduction to Photo Image Editing Techniques
Introduces the student to basic digital photo editing techniques, such as resizing, cropping, and adding text, effects, and filters, as well as managing and printing photographs using image editing software. Lecture 1 hour per week.

→ ITE 95 | 1 credit
Advanced Photo Image Editing Techniques
Introduces the student to advanced digital photo editing techniques, including selections, masking, image and color adjustments, as well as techniques for creating photo galleries, and various automated features using image editing software. Lecture 1 hour per week.

→ ITE 101 | 2 credits
Introduction to Microcomputers
Examines concepts and terminology related to microcomputers and introduces specific uses of microcomputers. Lecture 2 hours per week.
ITE 102 | 2 credits  
Computers and Information Systems  
Introduces terminology, concepts and methods of using computers in information systems. This course teaches computer literacy, not intended for Information Technology majors. Focuses on the history and current status of health information technology in public health and private healthcare settings. Covers medical terminology that is relevant to electronic health records. Emphasizes use and management of electronic health records and information systems. Blackboard and Vista Electronic Health Records information systems are highlighted. Lecture 2 hours per week.

ITE 109 | 3 credits  
Information Systems for Legal Assistants  
Presents terminology and concepts of computer-based systems, an introductory coverage of operating systems and business application software to conduct legal research for litigation and other application programs traditionally used in the practice of law. Lecture 3 hours per week.

ITE 115 | 4 credits  
Introduction to Computer Applications and Concepts  
Covers computer concepts and internet skills and uses a software suite which includes word processing, spreadsheet, database, and presentation software to demonstrate skills. Lecture 4 hours per week.

ITE 119 | 3 credits  
Information Literacy  
Presents the information literacy core competencies focusing on the use of information technology skills. Skills and knowledge will be developed in database searching, computer applications, information security and privacy, and intellectual property issues. Lecture 3 hours per week.

ITE 130 | 4 credits  
Introduction to Internet Services  
Provides students with a working knowledge of internet terminology and services including email, www browsing, search engines, ftp, file compression, and other services using a variety of software packages. Provides instruction for basic web page construction. Lecture 4 hours per week.

ITE 131 | 1 credit  
Survey of Internet Services  
Introduces students to basic Internet terminology and services including email, www browsing, search engines, ftp, telnet, and other services. Lecture 1 hour per week.

ITE 140 | 4 credits  
Spreadsheet Software  
Covers the use of spreadsheet software to create spreadsheets with formatted cells and cell ranges, control pages, multiple sheets, charts, and macros. Topics include type and edit text in a cell, enter data on multiple worksheets, work with formulas and functions, create charts, pivot tables, and styles, insert headers and footers, and filter data. Lecture 4 hours per week.

ITE 141 | 1 credit  
Microcomputer Software: Spreadsheets  
Provides first-time users sufficient information to make practical use of spreadsheet software using the basics of building spreadsheets. Lecture 1 hour per week.

ITE 150 | 4 credits  
Desktop Database Software  
Incorporates instruction in planning, defining, and using a database; performing queries; producing reports; working with multiple files; and concepts of database programming. Includes database concepts, principles of table design and table relationships, entering data, creating and using forms, using data from different sources, filtering, creating mailing labels. Lecture 4 hours per week.

ITE 151 | 1 credit  
Microcomputer Software: Database Management  
Presents first-time users with sufficient information to make practical use of database management software using the basics of building databases. Covers specific business applications. Lecture 1 hour per week.

ITE 200 | 3 credits  
Technology for Teachers (TSIP)  
Provides K-12 classroom teachers with the knowledge and skills needed to fulfill the Commonwealth of Virginia’s Technology Standards for Instructional Personnel. Students will finish the course with a solid understanding of educational technology, including how to use computers, how to access information on the World Wide Web, and how to integrate computers and educational technology into classroom curriculum. Students will learn how to base technology integration decisions on contemporary learning theories. Lecture 3 hours per week.

ITE 215 | 4 credits  
Advanced Computer Applications and Integration  
Incorporates advanced computer concepts including the integration of a software suite. Prerequisite: ITE 115 or AST 236. Lecture 4 hours per week.
INFORMATION TECHNOLOGY

NETWORKING

→ ITN 101 | 4 credits
Introduction to Network Concepts
Provides instruction in networking media, physical and logical topologies, common networking standards and popular networking protocols. Emphasizes the TCP/IP protocol suite and related IP addressing schemes, including CIDR. Includes selected topics in network implementation, support and LAN/WAN connectivity. Prerequisite: ITN 106 or ITN 171. Lecture 4 hours per week.

→ ITN 106 | 4 credits
Microcomputer Operating Systems
Teaches use of operating system utilities and multiple-level directory structures, creation of batch files, and configuration of microcomputer environments. May include a study of graphical user interfaces. Lecture 4 hours per week.

→ ITN 107 | 4 credits
Personal Computer Hardware and Troubleshooting
Includes specially designed instruction to give the student a basic knowledge of hardware and software configurations. Includes the installation of various peripheral devices as well as basic system hardware components. Lecture 4 hours per week.

→ ITN 109 | 4 credits
Internet and Network Foundations
Provides a basic comprehension of Internet and network technologies including IT job roles, connection methods, TCP/IP functionality and DNS. Explores web server technologies with security and project management concepts. Introduces network creation, physical and logical topologies including media properties, server types, IP addressing and network security. Lecture 4 hours per week.

→ ITN 110 | 4 credits
Client Operating System (Windows 7)
Covers installation, configuration, administration, management, maintenance, and troubleshooting of the desktop client operating system in a networked environment. Lecture 4 hours per week.

→ ITN 111 | 4 credits
Server Administration (Windows 2012)
Covers installation, configuration, administration, management, maintenance, monitoring, and troubleshooting of a server in a networked environment. Lecture 4 hours per week.

→ ITN 112 | 4 credits
Network Infrastructure (Windows 2012)
Covers planning, installation, configuration, administration, management, maintenance, monitoring, and troubleshooting of network infrastructure components. Prerequisite: ITN 111. Lecture 4 hours per week.

→ ITN 113 | 4 credits
Active Directory (Windows 2012)
Covers planning, installation, configuration, administration, management, maintenance, monitoring, and troubleshooting of Active Directory (AD) and Domain Name Service (DNS) in a networked environment. Prerequisite: ITN 111. Lecture 4 hours per week.

→ ITN 114 | 4 credits
Network Fundamentals, Router Basics, and Configuration (ICND1) - Cisco
Provides instruction in the fundamentals of networking environments, the basics of router operations, and basic router configuration. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ ITN 115 | 4 credits
Switching, Wireless, and WAN Technologies (ICND2) - Cisco
Provides the skills and knowledge to install, operate, and troubleshoot a small-to-medium sized branch office enterprise network, including configuring several switches and routers, configuring wireless devices, configuring VLANs, connecting to a WAN, and implementing network security. Prerequisite or co-requisite: ITN 154. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ ITN 170 | 4 credits
Linux System Administration
Focuses instruction on the installation, configuration and administration of the Linux operating system and emphasizes the use of Linux as a network client and workstation. Prerequisite: ITN 171. Lecture 4 hours per week.
→ ITN 171 | 4 credits
UNIX I
Provides an introduction to UNIX operating systems. Teaches login procedures, file creation, UNIX file structure, input/output control, and the UNIX shell. Lecture 4 hours per week.

→ ITN 213 | 4 credits
Information Storage and Management
Focuses on advanced storage systems, protocols, and architectures, including Storage Area Networks (SAN), Network Attached Storage (NAS), Fibre Channel Networks, Internet Protocol SANs (IPSAN), iSCSI, and Content Addressable Storage (CAS). Prerequisite: ITN 101. Lecture 4 hours per week.

→ ITN 218 | 4 credits
Server Infrastructure Design and Implementation (Windows 2012)
Provides the skills and knowledge needed to plan, design, and deploy a physical and logical server environment with an Active Directory Domain Services (AD DS) infrastructure. Prerequisite: ITN 111. Lecture 4 hours per week.

→ ITN 219 | 4 credits
Advanced Server Infrastructure Design and Implementation (Windows 2012)
Covers designing and implementation of advanced features in a server infrastructure. Prerequisite: ITN 111. Lecture 4 hours per week.

→ ITN 224 | 4 credits
Web Server Management
Focuses on the Web Server as a workhorse of the World Wide Web (www). Teaches how to set up and maintain a Web server and provides in-depth instruction in Web server operations and provides hands-on experience in installation and maintenance of a Web server. Prerequisite: ITN 109. Lecture 4 hours per week.

→ ITN 231 | 4 credits
Desktop Virtualization
Explores the concepts and capabilities of desktop and application virtualization with a focus on the installation, configuration, and management of the virtual desktop and application infrastructure. Prerequisite: ITN 254. Lecture 4 hours per week.

→ ITN 246 | 4 credits
IP Routing (ROUTE) - Cisco
Provides the skills and knowledge to implement, monitor, and maintain routing services in an enterprise network. Prerequisite: ITN 155. Lecture 4 hours per week.

→ ITN 247 | 4 credits
IP Switched Networks (SWITCH) - Cisco
Provides the skills and knowledge to implement, monitor, and maintain switching in the Cisco Enterprise Campus Architecture. Prerequisite: ITN 155. Lecture 4 hours per week.

→ ITN 248 | 4 credits
IP Network Troubleshooting and Maintenance (TSHOOT) - Cisco
Provides instruction to monitor, maintain, and troubleshoot a complex converged network. Prerequisites: ITN 246 and ITN 247. Lecture 4 hours per week.

→ ITN 254 | 4 credits
Virtual Infrastructure: Installation and Configuration
Explores concepts and capabilities of virtual architecture with a focus on the installation, configuration, and management of a virtual infrastructure, ESX Server, and Virtual Center. Covers fundamentals of virtual network design and implementation, fundamentals of storage area networks, virtual switching, virtual system management, and engineering for high availability. Prerequisites: ITN 171 and ITN 260. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ ITN 255 | 4 credits
Virtual Infrastructure: Deployment, Security, and Analysis
Focuses on the deployment, security, and analysis of the virtual infrastructure, including scripted installations, advanced virtual switching for security, server monitoring for health and resource management, high-availability management, system backups, and fault analysis. Prerequisite: ITN 254. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ ITN 257 | 4 credits
Cloud Computing: Infrastructure and Services
Focuses on cloud infrastructure, deployment, security models, and the key considerations in migrating to cloud computing. Covers the technologies and processes required to build traditional, virtualized, and cloud data center environments, including computation, storage, networking, desktop and application virtualization, business continuity, security, and management. Prerequisite: ITN 260. Lecture 4 hours per week.
→ ITN 258 | 4 credits  
Cloud Computing: Back-up and Recovery  
Focuses on backup and recovery concepts and technologies used in cloud computing and virtualized environments. Covers backup and recovery theory, methods, and planning, including replication, synchronization, snapshots, disaster recovery planning (DRP), and business continuity planning (BCP). **Lecture 4 hours per week.**

→ ITN 260 | 4 credits  
Network Security Basics  
Provides instruction in the basics of network security in depth. Includes security objectives, security architecture, security models and security layers, risk management, network security policy, and security training. Includes the give security keys, confidentiality integrity, availability, accountability, and auditability. **Prerequisite: ITN 101. Lecture 4 hours per week.**

→ ITN 261 | 4 credits  
Network Attacks, Computer Crime and Hacking  
Encompasses in-depth exploration of various methods for attacking and defending a network. Explores network security concepts from the viewpoint of hackers and their attack methodologies. Includes topics about hackers, attacks, Intrusion Detection Systems (IDS), malicious code, computer crime and industrial espionage. **Prerequisite: ITN 260. Lecture 4 hours per week.**

→ ITN 262 | 4 credits  
Network Communication, Security and Authentication  
Covers an in-depth exploration of various communication protocols with a concentration on TCP/IP. Explores communication protocols from the point of view of the hacker in order to highlight protocol weaknesses. Includes Internet architecture, routing, addressing, topology, fragmentation and protocol analysis, and the use of various utilities to explore TCP/IP. **Prerequisite: ITN 260. Lecture 4 hours per week.**

→ ITN 263 | 4 credits  
Internet/Intranet Firewalls and E-Commerce Security  
Provides an in-depth exploration of firewall, Web security, and e-commerce security. Explores firewall concepts, types, topology and the firewall's relationship to the TCP/IP protocol. Includes client/server architecture, the Web server, HTML and HTTP in relation to Web Security, and digital certification, D.509, and public key infrastructure (PKI). **Prerequisite: ITN 260. Lecture 4 hours per week.**

→ ITN 266 | 4 credits  
Network Security Layers  
Provides an in-depth exploration of various security layers needed to protect the network. Explores network security from the viewpoint of the environment in which the network operates and the necessity to secure that environment to lower the security risk to the network. Includes physical security, personnel security, operating system security, software security and database security. **Prerequisite: ITN 260. Lecture 4 hours per week.**

→ ITN 267 | 3 credits  
Legal Topics in Network Security  
Conveys an in-depth exploration of the civil and common law issues that apply to network security. Explores statutes, jurisdictional, and constitutional issues related to computer crimes and privacy. Includes rules of evidence, seizure and evidence handling, court presentation and computer privacy in the digital age. **Prerequisite or co-requisite: ITN 260. Lecture 3 hours per week.**

→ ITN 270 | 4 credits  
Advanced Linux Network Administration  
Focuses instruction on the configuration and administration of the Linux operating system as a network server. Emphasizes the configuration of common network services such as routing, http, DNS, DHCP, ftp, telnet, SMB, NFS, and NIS. **Prerequisite: ITN 170. Lecture 4 hours per week.**

→ ITN 275 | 4 credits  
Incident Response and Computer Forensics  
Prepares the student for a role on an organizational IT support staff where the need for resolving computer incidents is becoming increasingly common. Includes legal and ethical issues of search and seizure of computer and peripheral storage media leading to laboratory exercises examining computers configured with a mix of both simulated criminal and other activities which are not criminal in nature, but do violate scenario-driven organizational policy. Requires the student to make choices/recommendations for further pursuit of forensics evidence gathering and analysis. Students will select and gather the utilities and procedures necessary for a court-acceptable forensics toolkit which will then be used to gather and examine specially configured desktop computers. Students will then participate in a mock court proceeding using the collected evidence. Credit will be given to either ITN 275 or ITN 276 and ITN 277, but not all three courses. **Prerequisite: ITN 260. Lecture 4 hours per week.**
## INFORMATION TECHNOLOGY PROGRAMMING

- **ITP 100 | 4 credits**  
  **Software Design**  
  Introduces principles and practices of software development. Includes instruction in critical thinking, problem solving skills, and essential programming logic in structured and object-oriented design using contemporary tools. **Lecture 4 hours per week.**

- **ITP 112 | 4 credits**  
  **Visual Basic.NET I**  
  Concentrates instruction in fundamentals of object-oriented programming using Visual Basic.NET and the .NET Framework. Emphasizes program construction, algorithm development, coding, debugging, and documentation of graphical user interface applications. **Prerequisite: ITP 100. Lecture 4 hours per week.**

- **ITP 120 | 4 credits**  
  **Java Programming I**  
  Entails instruction in fundamentals of object-oriented programming using Java. Emphasizes program construction, algorithm development, coding, debugging, and documentation of console and graphical user interface applications. **Prerequisite: ITP 100. Lecture 4 hours per week.**

- **ITP 132 | 4 credits**  
  **C++ Programming I**  
  Centers instruction in fundamentals of object-oriented programming and design using C++. Emphasizes program construction, algorithm development, coding, debugging, and documentation of C++ applications. **Prerequisite: ITP 100. Lecture 4 hours per week.**

- **ITP 136 | 4 credits**  
  **C# Programming I**  
  Presents instruction in fundamentals of object-oriented programming and design using C#. Emphasizes program construction, algorithm development, coding, debugging, and documentation of applications within the .NET Framework. **Prerequisite: ITP 100. Lecture 4 hours per week.**

- **ITP 140 | 4 credits**  
  **Client Side Scripting**  
  Provides instruction in fundamentals of internet application design, development, and deployment using client side scripting language(s). **Lecture 4 hours per week.**

- **ITP 160 | 4 credits**  
  **Introduction to Game Design and Development**  
  Introduces object-oriented game design and development. Provides overview of the electronic game design and development process and underlines the historical context, content creation strategies, game careers, and future trends in the industry. Utilizes a game language environment to introduce game design, object-oriented paradigms, software design, software development and product testing. Teaches skills of writing a game design document and creating a game with several levels and objects. Integrates 2D animations, 3D models, sound effects, and background music as well as graphic backgrounds. **Lecture 4 hours per week.**

- **ITP 165 | 4 credits**  
  **Gaming and Simulation**  
  Introduces students to the concepts and applications of gaming and simulation through the use of gaming and simulation tools, as well as through basic programming skills. **Lecture 4 hours per week.**

- **ITP 170 | 4 credits**  
  **Project Management**  
  Introduces the concepts of project management as defined by the Project Management Institute, the accreditation body for project management. **Lecture 4 hours per week.**

- **ITP 212 | 4 credits**  
  **Visual Basic.NET II**  
  Includes instruction in application of advanced event-driven techniques to application development. Emphasizes database connectivity, advanced controls, web forms, and web services using Visual Basic.NET. **Prerequisite: ITP 112. Lecture 4 hours per week.**

- **ITP 220 | 4 credits**  
  **Java Programming II**  
  Imparts instruction in application of advanced object-oriented techniques to application development using Java. Emphasizes database connectivity, inner classes, collection classes, networking, and threads. **Prerequisite: ITP 120. Lecture 4 hours per week.**
→ **ITP 232 | 4 credits**  
**C++ Programming II**  
Presents in-depth instruction of advanced object-oriented techniques for data structures using C++. **Prerequisite:** ITP 132. **Lecture 4 hours per week.**

→ **ITP 236 | 4 credits**  
**C# Programming II**  
Focuses instruction in advanced object-oriented techniques using C# for application development. Emphasizes database connectivity and networking using the .NET Framework. **Prerequisite:** ITP 136. **Lecture 4 hours per week.**

→ **ITP 240 | 4 credits**  
**Server Side Programming**  
Centers around instruction in fundamentals of internet application design, development, and deployment. Includes implementation of server component models, security, and database connectivity using server-side programming. **Prerequisite:** ITD 134, ITP 100, ITP 112, ITP 120, ITP 132 or ITP 136. **Lecture 4 hours per week.**

→ **ITP 242 | 4 credits**  
**ASP Server Side Scripting**  
Provides instruction in creation of ASP.NET web applications to deliver dynamic content to a website utilizing server controls, web forms, and web services to accomplish complex data access tasks. **Prerequisite:** ITD 132. **Lecture 4 hours per week.**

→ **ITP 251 | 3 credits**  
**Systems Analysis and Design**  
Focuses on application of information technologies (IT) to system life cycle methodology, systems analysis, systems design, and system implementation practices. Covers methodologies related to identification of information requirements, feasibility in the areas of economic, technical and social requirements, and related issues. Software applications may be used to enhance student skills. **Prerequisite:** ITP 100. **Lecture 3 hours per week.**

→ **ITP 260 | 4 credits**  
**Concepts of Simulation**  
Expands the application of discrete event simulation and introduces continuous simulation. Develops object-oriented programming techniques. Presents distributed modeling and simulation network communication protocols. Explores the practical applications of distributed simulation in industry. **Lecture 4 hours per week.**

→ **ITP 265 | 4 credits**  
**Applications of Modeling and Simulation**  
Expands understanding of Modeling and Simulation via the implementation of a capstone project. Continues to develop object-oriented programming skills. Expands three-dimensional visualization skills. Examines all aspects of the project lifecycle. Develops workplace readiness for the Modeling and Simulation industry. **Lecture 4 hours per week.**

## INSTRUMENTATION

→ **INS 230 | 3 credits**  
**Instrumentation I**  
Introduces the fundamental scientific principles of process control including temperature, pressure, level, and flow measurements. Topics include transducers, thermometers, and gauges are introduced along with calibration. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **INS 233 | 4 credits**  
**Process Control Integration**  
Presents computer automation including PLCs, SCADA, and PC-based systems to control processes. Topics such as PLC control and computer data acquisition are introduced where students will use existing systems or build systems and control these systems with PLCs and computer data acquisition systems. Assesses students through test and project evaluations and the course will be assessed by graduate feedback. **Prerequisites:** INS 230 and ELE 233. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

## INTERIOR DESIGN

→ **IDS 100 | 3 credits**  
**Theory and Techniques of Interior Design**  
Introduces drafting and presentation, color theory, and coordination, space planning and arrangement of furnishings. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**
IDS 105 | 3 credits  
Architectural Drafting for Interior Design  
Introduces tools and equipment, lettering, methods of construction, designing, and delineation of architecture. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

IDS 106 | 3 credits  
Three-Dimensional Drawing and Rendering  
Provides instruction in graphic presentation of three-dimensionally drawn interiors. Presents the use of colored media to render three-dimensional drawings. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

IDS 109 | 3 credits  
Styles of Furniture and Interiors  
Teaches history of furnishings and interiors from the ancient world to the present. **Lecture 3 hours per week.**

IDS 116 | 4 credits  
Period Residential Design  
Plans a period-inspired interior. May use field trips and visual materials to enhance this project. Presents problems and their solutions found in this kind of project. May require a final visual presentation with all necessary furnishings, materials, and color boards with rendered perspectives. **Prerequisites: IDS 105, IDS 106 and IDS 109. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.**

IDS 120 | 3 credits  
Estimation for Interior Coverings  
Provides instruction in estimation of yardages for window treatments, carpet, custom carpet designs, wall coverings, tile, etc. Covers fxituring, labor costing, procedures of fabrication and styling options. May require site/research visits to fabricators. **Lecture 3 hours per week.**

IDS 122 | 3 credits  
Staging for Interior Designers  
Introduces staging and its importance in preparing a private residence for sale. Focuses on market trends, competitive pricing strategies, and marketing techniques. Includes interior and exterior repairs, upgrades, and re-design techniques relevant to preparing a property for sale. Identifies simple re-design techniques to create buyer interest. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

IDS 130 | 3 credits  
Introduction to Kitchen and Bath Design Systems  
Introduces quality kitchen and bath design elements and National Kitchen and Bath Association (NKBA) Planning Guidelines. Presents basic components of kitchen and bath design, including assessment of existing conditions and construction systems, measurement, product selection, specification, and communication of the design. Teaches coordination of kitchen and bath design with existing structural, electrical, mechanical, plumbing, and ventilation systems. **Lecture 3 hours per week.**

IDS 205 | 3 credits  
Materials and Sources  
Presents textiles, floor and wall coverings, and window treatments. Emphasizes construction, fiber, finish, and code applications. May use research and field trips to trade sources representing these elements. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

IDS 206 | 3 credits  
Lighting and Furnishings  
Provides instruction in lighting terminology and calculations and instructions in techniques of recognizing quality of construction in furnishings and related equipment. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

IDS 215 | 3 credits  
Theory and Research in Commercial Design  
Teaches graphic standards and specifications in interior design. Explains handicap codes and fire codes for large scale spaces. Provides programming and space planning with emphasis on systems furniture. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

IDS 217 | 3 credits  
Advanced Rendering and Presentation  
Gives advanced problems in rendering and visual presentation. Teaches methods of presentation and development of completed interior design projects with rendered perspectives and presentation boards of furnishings, fixtures, finishes, schedules, and related materials. **Prerequisites: IDS 105 and IDS 106. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.**

IDS 222 | 4 credits  
Designing Commercial Interiors II  
Presents problems in designing and developing presentations with emphasis on office spaces. **Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.**
→ **IDS 225 | 3 credits**  
**Business Procedures**  
Provides instruction in preparation of contracts, purchase orders, specifications, and other business forms used in the interior design field. **Lecture 3 hours per week.**

→ **IDS 235 | 3 credits**  
**Antiques**  
Involves process of research, authentication, and determining provenance. Covers examples of furnishings, fixtures, textiles, glass, and ceramics. May provide field trips, lectures, examination, and discussion to assist in determining age, condition, and other properties. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **IDS 245 | 3 credits**  
**Computer-Aided Drafting for Interior Designers**  
Instructs in the use of the computer for drafting of floor plans, elevations, perspectives, shadowing, lighting, and color applications using AutoCAD software and the architectural and engineering software. **Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.**

→ **IDS 246 | 3 credits**  
**Advanced CADD for Interior Designers**  
Introduces advanced methods of designing project spaces in a computer-aided design based program. Includes wire frame construction, skins, lighting the space, fly through, entourage, presentation in various oblique formats as well as one and two point perspective views. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **IDS 247 | 3 credits**  
**Kitchen and Bath Design Software**  
Introduces software used primarily for designing kitchens and bathrooms. Includes room design concepts and standard appliance and fixture layouts. **Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.**

→ **IDS 247 | 3 credits**  
**Green Design for Interior Designers**  
Introduces interior design solutions that support the environment and can be utilized in new and existing structures. Includes the principles of green design and steps in producing design solutions using natural and toxin free materials. Covers material sources, interior finishes, furnishings and lighting and their applications. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **IDS 255 | 3 credits**  
**Green Design for Commercial Interiors**  
Presents green design techniques through the application of principles and practices of green design through a commercial design application. Introduces the building certification process and applies this process to interior designs. Applies the LEED rating system to designs to determine the level of LEED certification. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **IDS 285 | 3 credits**  
**Portfolio and Resume Preparation for Interior Designers**  
Introduces the proper elements of a professional resume for employment in the field. Focuses on the preparation of portfolio content, recorded images, and construction methods. Introduces various methods of digital production of portfolio materials, as well as traditional formats. Includes detailed instruction on proper oral presentation skills, interview preparation and techniques, and professional dress and behaviors. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **INT 105-106 | 3 credits each**  
**Interpreting Foundations I-II**  
Develops fundamental skills of interpreting, including cognitive processes and intralingual language development in English and ASL. Reviews Process Models of Interpreting, and uses one to analyze interpretations. Develops feedback skills essential to the team interpreting process. **Prerequisite for INT 106: INT 105. Lecture 3 hours per week.**

→ **INT 107 | 3 credits**  
**Translation Skills**  
Further develops fundamental skills needed for the task of interpreting. Targets comprehending source language (either ASL or English), transferring content into memory store (breaking from original form), restructuring into target language, maintaining message equivalence, conveying implicit and inferred information, and applying appropriate discourse structure. Reviews Process Models of Interpreting, and uses it to analyze translations. Further develops feedback skills essential to the team interpreting process. **Prerequisite: INT 105. Lecture 3 hours per week.**
→ **INT 130 | 3 credits**  
Interpreting: An Introduction to the Profession  
Introduces basic principles and practices of interpreting, focusing on the history of the profession, logistics of interpreting situations, regulatory and legislative issues, resources, and the Code of Ethics. Describes the state quality assurance screening and national certification exam systems, including test procedures. **Lecture 3 hours per week.**

→ **INT 133 | 3 credits**  
ASL-to-English Interpretation I  
Begins consecutively interpreting monologues from the source language (ASL) to the target language (English). Watch entire ASL monologues, process them, analyze them, then choose appropriate English to match the message. Eventually interpret the monologue into English. Puts interpreting theory into practice in a lab environment. Conducts research in the field of interpretation. Develops team interpreting techniques. Interacts with consumers of ASL-English interpretation. **Prerequisite: INT 107. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **INT 134 | 3 credits**  
English-to-ASL Interpretation I  
Begins consecutively interpreting monologues from the source language (English) to the target language (ASL). Listen to entire English monologues, process them, analyze them, then choose appropriate ASL to match the message. Puts interpreting theory into practice in a lab environment. Conducts research in the field of interpretation. Develops team interpreting techniques. Encourages interaction with consumers of ASL-English interpretation. **Prerequisite: INT 107. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **INT 233 | 3 credits**  
ASL-to-English Interpretation II  
Perform simultaneous interpretations of monologues in the source language (ASL) to the target language (English). Process an incoming ASL monologue while simultaneously producing an appropriate interpretation in English. Conduct research in the field of interpretation. Apply team interpreting techniques. Interact with consumers of interpretation. **Prerequisites: INT 133 and INT 134. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **INT 234 | 3 credits**  
English-to-ASL Interpretation II  
Perform simultaneous interpretations of monologues in the source language (English) into the target language (ASL). Process an incoming English monologue while simultaneously producing an appropriate interpretation in ASL. Conduct research in the field of interpretation. Apply team interpreting techniques. Interact with consumers of interpretation. **Prerequisites: INT 133 and INT 134. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **INT 235 | 3 credits**  
Interpreting in the Educational Setting  
Examines the role, responsibilities, and communication techniques of the educational setting. Provides information on the nature and needs of the deaf student and methods used in working with students who are deaf and hard of hearing. Describes various communication systems used for a variety of educational environments. **Prerequisites: ASL 102 and INT 130. Lecture 3 hours per week.**

→ **INT 236 | 3 credits**  
Interpreting in Special Situations  
Studies roles, responsibilities, and qualifications involved in interpreting in specific settings, such as medical, legal, conference, religious, and performing arts. Addresses specific linguistic and ethical concerns for each. **Prerequisites: ASL 102 and INT 130. Lecture 3 hours per week.**

→ **INT 250 | 3 credits**  
Dialogic Interpretation I  
Applies interpreting fundamentals. Interprets dialogs between spoken English and ASL users. Analyzes interpretations by using a Process Model of Interpreting. Conducts research. Practices team interpreting skills in an interactive interpreting environment. Prepares for the interactive nature of standard interpreting evaluations. **Prerequisites: INT 233 and INT 234. Lecture 3 hours per week.**
**JAPANESE**

→ **JPN 15-16 | 2 credits each**  
Japanese for Business I-II  
Introduces students with little or no prior instruction in the Japanese language to the basic vocabulary and conversation skills needed for various situations in business settings, including cultural mores and customs. **Prerequisite for JPN 16:** JPN 15 or previous experience with the language. **Lecture 2 hours per week**

**LEGAL ADMINISTRATION**  
**(PARALEGAL STUDIES)**

→ **LGL 110 | 3 credits**  
Introduction to Law and the Legal Assistant  
Introduces various areas of law in which a legal assistant may be employed. Includes study of court systems (Virginia and federal) as well as a brief overview of criminal law, torts, domestic relations, evidence, ethics, the role of the legal assistant, and other areas of interest. **Prerequisite:** Placement into ENG 111. **Lecture 3 hours per week**

→ **LGL 115 | 3 credits**  
Real Estate Law for Legal Assistants  
Studies law of real property and gives in-depth survey of the more common types of real estate transactions and conveyances such as deeds, contracts, leases, and deeds of trust. Focuses on drafting these various instruments and studies the system of recording and search of public documents. **Prerequisite or co-requisite:** LGL 110. **Lecture 3 hours per week**

→ **LGL 117 | 3 credits**  
Family Law  
Studies elements of a valid marriage, grounds for divorce and annulment, separation, defenses, custody, support, adoptions, and applicable tax consequences. Includes property settlement, pre- and ante-nuptial agreements, pleadings, and rules of procedure. May include specific federal and Virginia consumer laws. **Prerequisite or co-requisite:** LGL 110. **Lecture 3 hours per week**

→ **LGL 125 | 3 credits**  
Legal Research  
Provides an understanding of various components of a law library, and emphasizes research skills through the use of digests, encyclopedias, reporter systems, codes, Shepard’s Citations, ALR, and other research tools. May include overview of computer applications and writing projects. **Prerequisite:** LGL 110. **Lecture 3 hours per week**

→ **LGL 126 | 3 credits**  
Legal Writing  
Studies proper preparation of various legal documents, including legal memoranda, letters, and pleadings. Involves practical applications. May include case and appellate briefs. **Prerequisites:** ENG 111 and LGL 125. **Lecture 3 hours per week**

→ **LGL 130 | 3 credits**  
Law Office Administration and Management  
Introduces management principles and systems applicable to law firms, including record keeping, disbursements, escrow accounts, billing, and purchasing. May include accounting methods and software packages applicable to law firms. **Prerequisite or co-requisite:** LGL 110. **Lecture 3 hours per week**

→ **LGL 200 | 1 credit**  
Ethics for the Legal Assistant  
Examines general principles of ethical conduct applicable to legal assistants. Includes the application of rules of ethics to the practicing legal assistant. **Prerequisite or co-requisite:** LGL 110. **Lecture 1 hour per week**

→ **LGL 215 | 3 credits**  
Torts  
Studies fundamental principles of the law of torts. May include preparation and use of pleadings and other documents involved in the trial of a civil action. Emphasizes personal injury, products liability, and malpractice cases. **Prerequisite:** LGL 110. **Lecture 3 hours per week**

→ **LGL 216 | 3 credits**  
Trial Preparation and Discovery Practice  
Examines the trial process, including the preparation of a trial notebook, pretrial motions, and orders. May include preparation of interrogatories, depositions, and other discovery tools used in assembling evidence in preparation for the trial or an administrative hearing. **Prerequisite:** LGL 110. **Lecture 3 hours per week**
→ **LGL 218 | 3 credits**  
**Criminal Law**  
Focuses on major crimes, including their classification, elements of proof, intent, conspiracy, responsibility, parties, and defenses. Emphasizes Virginia law. May include general principles of applicable constitutional law and criminal procedure. **Prerequisite:** LGL 110. **Lecture 3 hours per week.**

→ **LGL 221 | 3 credits**  
**E-Practice**  
Prepares students to electronically file (e-file) in federal court, state court, and appropriate administrative agencies. Provides the student with the proper information on electronic discovery (e-discovery), including how data are requested, located, and searched in the course of litigation. Focuses on the proper process required to be in conformance with the appropriate laws. **Prerequisite:** LGL 110. **Lecture 3 hours per week.**

→ **LGL 225 | 3 credits**  
**Estate Planning and Probate**  
Introduces various devices used to plan an estate, including wills, trusts, joint ownership and insurance. Considers various plans in light of family situations and estate objectives. Focuses on practices involving administration of an estate, including taxes and preparation of forms. **Prerequisite:** LGL 110. **Lecture 3 hours per week.**

→ **LGL 226 | 3 credits**  
**Real Estate Abstracting**  
Reviews aspects of abstracting title to real estate, recordation of land transactions, liens, grantor-grantee indices, warranties, covenants, restrictions, and easements. **Prerequisite:** LGL 115. **Lecture 3 hours per week.**

→ **LGL 230 | 3 credits**  
**Legal Transactions**  
Presents an in-depth study of general contract law, including formation, breach, enforcement, and remedies. May include an overview of UCC sales, commercial paper, and collections. **Prerequisite:** LGL 110. **Lecture 3 hours per week.**

→ **LGL 235 | 3 credits**  
**Legal Aspects of Business Organizations**  
Studies fundamental principles of agency law and the formation of business organizations. Includes sole proprietorships, partnerships, corporations, limited liability companies, and other business entities. Reviews preparation of the documents necessary for the organization and operation of businesses. **Prerequisite:** LGL 110. **Lecture 3 hours per week.**

→ **LGL 236 | 3 credits**  
**Elder Law**  
Explores the legal issues affecting the elderly population such as Social Security, Supplemental Security Income (SSI), Medicare, Medicaid, long-term care insurance, retirement housing and long-term care options, age discrimination, elder abuse and neglect, and estate and planning issues related to incapacity-guardianship, advanced medical directives, power of attorney, and end-of-life decisions. **Prerequisite:** LGL 110. **Lecture 3 hours per week.**

→ **LGL 238 | 3 credits**  
**Bankruptcy**  
Provides a practical understanding of non-bankruptcy alternatives and the laws of bankruptcy including Chapters 7, 11, 12 and 13 of the Bankruptcy Code. Emphasis will be placed on preparing petitions, schedules, statements and other forms. **Prerequisite or co-requisite:** LGL 110. **Lecture 3 hours per week.**

→ **LGL 250 | 3 credits**  
**Immigration Law**  
Provides an introduction to immigration law and policy, giving an overview of the United States legal system that regulates the admission, exclusion, removal, and naturalization of immigrants. Includes issues concerning refugees, asylum seekers, illegal immigrants, and undocumented aliens. **Prerequisite or co-requisite:** LGL 110. **Lecture 3 hours per week.**

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**MACHINE TECHNOLOGY**

→ **MAC 121 | 3 credits**  
**Numerical Control I**  
Focuses on numerical control techniques in metal forming and machine processes. Includes theory and practice in lathe and milling machine computer numerical control program writing, setup and operation. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**
→ MAC 122 | 3 credits  
**Numerical Control II**  
Focuses on numerical control techniques in metal forming and machine processes. Includes theory and practice in lathe and milling machine computer numerical control program writing, setup and operation. Part II of II.  
**Prerequisite:** MAC 121. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MAC 126 | 3 credits  
**Introductory CNC Programming**  
Introduces programming of computerized numerical control machines with hands-on programming and operation of CNC machines. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MAC 150 | 3 credits  
**Introduction to Computer Aided Manufacturing**  
Introduces computer aided manufacturing (CAM) with emphasis on programming of numerical control machinery. Teaches program writing procedures using proper language and logic and a CAM programming system to produce numerical control code for machines. Teaches basic computer usage, 2 1/2D and 3D CAD-CAM integration, and code-to-machine transfer. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MAC 161 | 3 credits  
**Machine Shop Practices I**  
Introduces safety procedures, bench work, hand tools, precision measuring instruments, drill presses, cut-off saws, engine lathes, manual surface grinders, and milling machines. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MAC 162 | 3 credits  
**Machine Shop Practices II**  
Introduces safety procedures, bench work, hand tools, precision measuring instruments, drill presses, cutoff saws, engine lathes, manual surface grinders, and milling machines. Part II of II. **Prerequisite:** MAC 161. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MAC 209 | 3 credits  
**Standards, Measurements and Calculations**  
Presents typical mathematical and mechanical problems requiring the use of reference standards such as the Machinery’s Handbook for solution. Presents use of the Coordinate Measuring Machine for solution. Lecture 3 hours per week.

→ MAR 120 | 3 credits  
**Introduction to Ship Systems**  
Introduces basic aspects of shipboard work, including: shipboard jobs, shipboard safety, ship classes, knot tying, ships nomenclature, compartmentation, basic applied math skills, basic hand tools, and working in confined spaces. Provides introductory information regarding career options in the shipbuilding/repair industry with information on career pathways and registered apprenticeship opportunities in the region. Lecture 3 hours per week.

→ MAR 130 | 3 credits  
**Marine Maintenance Mechanics**  
Introduces the various subjects comprising the study of mechanics to meet the unique requirements of marine practice. Includes basic nomenclature, construction and function of hulls, motive power principles, propellers, steering systems, controls, electrical equipment, instruments, and accessories. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MAR 137 | 4 credits  
**Basic Marine Electrical Circuits**  
Focuses on basic electrical circuits common to small boat operations. Includes fundamentals of generators, alternators and their regulators, storage batteries, lighting systems instruments, protective devices, and all other primary power circuits, and the proper methods of installation, testing, troubleshooting, and repair. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ MAR 140 | 4 credits  
**Introduction to Hydraulics and Hydraulic Systems**  
Focuses on the fundamentals of basic symbols and diagrams of fluid power circuits. Includes control circuits from single motion to multiple interlocks, selection and use of common hydraulic components, operation and maintenance of shipboard pumps to include fuel transfer, raw water, fresh water, deck power, bilge and ballast, and sanitary electrical control of hydraulic circuits by switches, relays and solenoids. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.
→ **MAR 157 | 4 credits**  
Small Outboard Engine Service  
Focuses on the construction, theory of operation, maintenance and repair of small outboard motors. Includes modern diagnostic and test procedures, trouble shooting and repair followed by actual test tank operation. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **MAR 158 | 4 credits**  
Inboard Engine Service  
Focuses on maintenance, repair and overhaul of modern gasoline inboard engines, drive components and stern drives. Stresses water diagnosis and test procedures. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **MAR 159 | 4 credits**  
Large Outboard Engine Service  
Focuses on the construction, theory of operation, maintenance and repair of larger outboard motors. Includes conventional D.C. battery charging systems and alternator theory, operation and maintenance, conventional and capacitive discharge ignition system, hydraulic system, modern diagnostic and test procedures, troubleshooting and repair followed by actual test tank operation. **Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **MAR 160 | 3 credits**  
Marine Electrical for Maritime Vessels  
Focuses on basic electrical circuits common to maritime vessel electrical systems. Includes fundamentals of AC power plants, electrical and lighting circuits, protective devices, and all other primary power circuits, and the proper methods of installation, testing, troubleshooting, and repair. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **MAR 165 | 4 credits**  
Stern Drive Transmission Service  
Teaches the fundamentals of stern drive marine propulsion units versus conventional shaft and propeller configurations. Stresses differences in shafting, bearings, lubrication, and steering. Includes proper methods of operation and maintenance; also minor and major repair operations to include complete disassembly, inspection and troubleshooting and repair. **Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ **MAR 210 | 4 credits**  
Marine Electronics for Maritime Vessels  
Focuses on theory of operation, service and repair of marine electronic systems. Includes control systems, navigation, radar, GPS, HF, VHF, satellite communications, lightning and corrosion protection systems. **Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.**

### MARKETING

→ **MKT 100 | 3 credits**  
Principles of Marketing  
Presents principles, methods, and problems involved in marketing to consumers and organizational buyers. Discusses problems and policies connected with distribution and sale of products, pricing, promotion, and buyer motivation. Examines variations of marketing research, legal, social, ethical, e-commerce, and international considerations in marketing. **Lecture 3 hours per week.**

→ **MKT 110 | 3 credits**  
Principles of Selling  
Presents a fundamental, skills-based approach to selling and relationship building. Emphasizes learning effective interpersonal communication skills in all areas of the sales process through skill-building activities. Examines entry-level sales careers in retailing, wholesaling, services and industrial selling. **Lecture 3 hours per week.**

→ **MKT 160 | 3 credits**  
Marketing for Small Business  
Presents the development of the marketing mix for a small business. Includes areas such as product development, pricing, promotion, salesmanship, customer relations, and consumer behavior. **Lecture 3 hours per week.**

→ **MKT 170 | 1-2 credits**  
Customer Service  
Introduces students to the concepts of marketing as they relate to customer service. Teaches development of customer service training and implementation of strategies to improve customer relations and service. Includes lecture, role-playing, and case studies. **Lecture 1-2 hours per week.**
→ MKT 215 | 3 credits  
Sales and Marketing Management  
Emphasizes the relationship of professional sales skills and marketing management techniques. Demonstrates the use of the Internet to enhance marketing. Studies legal and ethical considerations. **Lecture 3 hours per week.**

→ MKT 216 | 3 credits  
Retail Organization and Management  
Examines the organization of the retail establishment to accomplish its goals in an effective and efficient manner. Includes study of site location, internal layout, store operations, and security. Examines the retailing mix, the buying or procurement process, pricing, and selling. Studies retail advertising, promotion, and publicity as a coordinated effort to increase store traffic. **Lecture 3 hours per week.**

→ MKT 220 | 3 credits  
Principles of Advertising  
Emphasizes the role of advertising in the marketing of goods, services, and ideas. Discusses the different uses of advertising; types of media; how advertising is created; agency functions; and legal, social, and economic aspects of the industry. Introduces advertising display, copy and art work preparation, printing and selection of media. **Lecture 3 hours per week.**

→ MKT 260 | 3 credits  
Customer Service Management  
Examines the role of customer service in achieving a firm’s long-term goals; discusses the basic principles of effective customer service; explores the tasks and responsibilities of a customer service manager. Includes such topics as purpose of customer service; establishment of customer service goals and policies; recruitment, selection and training of customer service employees; motivation techniques; empowering employees for better decision making; and evaluation of customer service employees and program. **Lecture 3 hours per week.**

→ MKT 271 | 3 credits  
Consumer Behavior  
Examines the various influences affecting consumer buying behavior before, during, and after product purchases. Describes personal, societal, cultural, environmental, group, and economic determinants on consumer buying. **Lecture 3 hours per week.**

→ MKT 276 | 3 credits  
International Marketing Management  
Presents the process of marketing and management and applies it to the marketing of products within the global marketplace. Introduces the student to activities involving the gathering and analyzing of information in the development and implementation of an international marketing plan. **Lecture 3 hours per week.**

→ MKT 282 | 3 credits  
Principles of E-Commerce  
Studies on-line business strategies, and the hardware and software tools necessary for Internet commerce. Includes the identification of appropriate target segments, the development of product opportunities, pricing structures, distribution channels and execution of marketing strategies. **Lecture 3 hours per week.**

→ MKT 284 | 3 credits  
Social Media Marketing  
Surveys the use of social networks and online communities such as blogs, wikis and virtual events that allow companies to expand their interaction with customers and develop relationships with collaborative communities. Emphasizes the ongoing transformation of the way companies adjust their marketing plans to improve interaction with customers online. **Lecture 3 hours per week.**

### MATH ESSENTIALS

→ MTE 1 | 1 credit  
Operations with Positive Fractions  
Includes operations and problem solving with proper fractions, improper fractions, and mixed numbers without the use of a calculator. Emphasizes applications and includes U. S. customary units of measure. Credit is not applicable toward graduation. **Prerequisite: Qualifying Placement Test score. Lecture 1 hour per week.**

→ MTE 2 | 1 credit  
Operations with Positive Decimals and Percents  
Includes operations and problem solving with positive decimals and percents. Emphasizes applications and includes U. S. customary and metric units of measure. Credit is not applicable toward graduation. **Prerequisite: MTE 1 or qualifying Placement Test score. Lecture 1 hour per week.**
→ MTE 3  |  1 credit
Algebra Basics
Includes basic operations with algebraic expressions and solving simple algebraic equations using signed numbers with emphasis on applications. Credit is not applicable toward graduation. Prerequisite: MTE 2 or qualifying Placement Test score. Lecture 1 hour per week.

→ MTE 4  |  1 credit
First Degree Equations and Inequalities in One Variable
Includes solving first degree equations and inequalities containing one variable, and using them to solve application problems. Emphasizes applications and problem solving. Credit is not applicable toward graduation. Prerequisite: MTE 3 or qualifying Placement Test score. Lecture 1 hour per week.

→ MTE 5  |  1 credit
Linear Equations, Inequalities and Systems of Linear Equations in Two Variables
Includes finding the equation of a line, graphing linear equations and inequalities in two variables and solving systems of two linear equations. Emphasizes writing and graphing equations using the slope of the line and points on the line, and applications. Credit is not applicable toward graduation. Prerequisite: MTE 3 or qualifying Placement Test score. Lecture 1 hour per week.

→ MTE 6  |  1 credit
Exponents, Factoring and Polynomial Equations
Includes techniques of factoring polynomials and using these techniques to solve polynomial equations. Emphasizes applications using polynomial equations solved by factoring. Credit is not applicable toward graduation. Prerequisite: MTE 5 or qualifying Placement Test score. Lecture 1 hour per week.

→ MTE 7  |  1 credit
Rational Expressions and Equations
Includes simplifying rational algebraic expressions, solving rational algebraic equations and solving applications that use rational algebraic equations. Credit is not applicable toward graduation. Prerequisite: MTE 6 or qualifying Placement Test score. Lecture 1 hour per week.

→ MTE 8  |  1 credit
Rational Exponents and Radicals
Includes simplifying radical expressions, using rational exponents, solving radical equations and solving applications using radical equations. Credit is not applicable toward graduation. Prerequisite: MTE 7 or qualifying Placement Test score. Lecture 1 hour per week.

→ MTE 9  |  1 credit
Functions, Quadratic Equations and Parabolas
Includes an introduction to functions in ordered pair, graph, and equation form. Also introduces quadratic functions, their properties and their graphs. Credit is not applicable toward graduation. Prerequisite: MTE 8 or qualifying Placement Test score. Lecture 1 hour per week.

→ MTH 103  |  3 credits
Applied Technical Mathematics I
Presents a review of arithmetic, elements of algebra, geometry, and trigonometry. Directs applications to specialty areas. Prerequisite: Qualifying Placement Test score, MTE 1-3 or equivalent. Lecture 3 hours per week.

→ MTH 115  |  3 credits
Technical Mathematics I
Presents algebra through exponential and logarithmic functions, trigonometry, vectors, analytic geometry, and complex numbers. Prerequisite: Qualifying Placement Test score, MTE 1-9 or equivalent. Lecture 3 hours per week.

→ MTH 121  |  3 credits
Fundamentals of Mathematics I
Covers concepts of numbers, fundamental operations with numbers, formulas and equations, graphical analysis, binary numbers, Boolean and matrix algebra, linear programming, and elementary concepts of statistics. Prerequisite: Qualifying Placement Test score, MTE 1-3 or equivalent. (Intended for occupational/technical programs.) Lecture 3 hours per week.
→ MTH 126 | 3 credits  
Mathematics for Allied Health  
Presents scientific notation, precision and accuracy, decimals and percents, ratio and proportion, variation, simple equations, techniques of graphing, use of charts and tables, logarithms, and the metric system. **Prerequisite:** Qualifying Placement Test score, MTE 1-5 or equivalent. Lecture 3 hours per week.

→ MTH 152 | 3 credits  
Mathematics for the Liberal Arts II  
Presents topics in functions, combinatorics, probability, statistics and algebraic systems. **Prerequisite:** Qualifying Placement Test score, MTE 1-5 or equivalent. Lecture 3 hours per week.

→ MTH 157 | 3 credits  
Elementary Statistics  
Presents elementary statistical methods and concepts including descriptive statistics, estimation, hypothesis testing, linear regression, and categorical data analysis. (Credit will not be awarded for both MTH 157 and MTH 240 or MTH 241.) **Prerequisite:** MTH 152 or MTH 158. Lecture 3 hours per week.

→ MTH 158 | 3 credits  
College Algebra  
Covers the structure of complex number systems, polynomials, rational expressions, graphing, systems of equations and inequalities and functions, quadratic and rational equations and inequalities. **Prerequisite:** Qualifying Placement Test score, MTE 1-9 or equivalent. Lecture 3 hours per week.

→ MTH 163 | 3 credits  
Precalculus I  
Presents college algebra, matrices, and algebraic, exponential, and logarithmic functions. (Credit will not be awarded for both MTH 163 and MTH 166.) **Prerequisite:** Qualifying Placement Test score, MTE 1-9 or equivalent. Lecture 3 hours per week.

→ MTH 164 | 3 credits  
Precalculus II  
Presents trigonometry, analytic geometry, and sequences and series. (Credit will not be awarded for both MTH 164 and MTH 166.) **Prerequisite:** MTH 163 or equivalent. Lecture 3 hours per week.

→ MTH 166 | 5 credits  
Precalculus with Trigonometry  
Presents college algebra, analytic geometry, trigonometry, and algebraic exponential and logarithmic functions. (Credit will not be awarded for both MTH 163-164 and MTH 166.) **Prerequisite:** Qualifying Placement Test score, MTE 1-9 or equivalent. Lecture 5 hours per week.

→ MTH 173 | 5 credits  
Calculus with Analytic Geometry I  
Presents analytic geometry and the calculus of algebraic and transcendental functions including the study of limits, derivatives, differentials, and introduction to integration along with their applications. Designed for mathematical, physical, and engineering science programs. (Credit will not be awarded for more than one of MTH 173, MTH 175 or MTH 273.) **Prerequisite:** Qualifying Placement Test score, MTH 164 or MTH 166. Lecture 5 hours per week.

→ MTH 174 | 4 credits  
Calculus with Analytic Geometry II  
Continues the study of analytic geometry and the calculus of algebraic and transcendental functions including rectangular, polar, and parametric graphing, indefinite and definite integrals, methods of integration, and power series along with applications. Designed for mathematical, physical, and engineering science programs. (Credit will not be awarded for more than one of MTH 174, MTH 176 or MTH 274.) **Prerequisite:** MTH 173 or equivalent. Lecture 4 hours per week.

→ MTH 243 | 3 credits  
Probability and Statistics I  
Uses calculus to develop the theory of probability and statistics including discrete and continuous distribution theory, Poisson processes, moment generating functions, central limit theorem, hypothesis testing and estimation. Designed for mathematical, physical, and engineering science programs. **Prerequisite:** MTH 174 or equivalent. Lecture 3 hours per week.

→ MTH 270 | 3 credits  
Applied Calculus  
Introduces limits, continuity, differentiation and integration of algebraic and transcendental functions, techniques of integration, and partial differentiation. (Credit will not be awarded for both MTH 270 and MTH 271.) **Prerequisite:** MTH 163, MTH 166 or equivalent. Lecture 3 hours per week.
MTH 277  |  4 credits  
Vector Calculus  
Presents vector valued functions, partial derivatives, multiple integrals, and topics from the calculus of vectors. Designed for mathematical, physical, and engineering science programs. **Prerequisite:** MTH 174 or equivalent. Lecture 4 hours per week.

MTH 279  |  4 credits  
Ordinary Differential Equations  
Introduces ordinary differential equations. Includes first order differential equations, second and higher order ordinary differential equations with application. Designed for mathematical, physical, and engineering science programs. **Prerequisite:** MTH 174 or equivalent. Lecture 4 hours per week.

MTH 285  |  3 credits  
Linear Algebra  
Covers matrices, vector spaces, determinants, solutions of systems of linear equations, basis and dimension, eigen values, and eigen vectors. Designed for mathematical, physical and engineering science programs. **Prerequisite:** MTH 174 or equivalent. Lecture 3 hours per week.

MECH 111  |  3 credits  
Materials for Industry  
Studies the nature, structure, properties, and typical applications of metallic, polymeric, ceramic, and composite materials. Focuses on applications of materials as well as the behavior of materials subjected to external stresses. Addresses as required the earth’s limited material resources, energy efficient materials, dependence on foreign sources of materials, material systems, thermal processing, and electronic-related materials. **Lecture 3 hours per week.**

MEC 120  |  3 credits  
Principles of Machine Technology  
Studies fundamental machine operations and practices, including layout, measuring devices, hand tools, drilling, reaming, turning between centers, cutting tapers and threads, and milling; fabrication of mechanical parts on drill press, lathe and mill. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

MEC 126  |  3 credits  
Computer Programming for Technologists  
Introduces computer software and programming. Covers programming for the microcomputer using high level languages. Teaches computer solutions of mathematical problems in applications such as circuit analysis and static equilibrium. **Prerequisite:** ELE 150. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

MEC 131  |  3 credits  
Mechanics I - Statics for Engineering Technology  
Teaches Newton’s laws, resultants and equilibrium of force systems, trusses and frames, determination of centroids, and distributed loads and moments of inertia. Introduces dry friction and force systems in space. **Prerequisite:** MTH 164 or MTH 166. Lecture 3 hours per week.

MEC 132  |  3 credits  
Mechanics II - Strength of Materials for Engineering Technology  
Teaches the concepts of stress and strain. Provides an analysis of stresses and deformations in loaded members, connectors, shafts, beams, columns, and combined stress. **Prerequisite:** MEC 131. Lecture 3 hours per week.

MEC 140  |  3 credits  
Introduction to Mechatronics  
Presents foundational concepts in mechatronics including analog and digital electronics, sensors, actuators, microprocessors, and microprocessor interfacing to electromechanical systems. Surveys components and measurement equipment used in the design, installation, and repair of mechatronic equipment and circuits. **Prerequisite:** Divisional approval. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

MEC 154  |  3 credits  
Mechanical Maintenance I  
Provides an overview of basic maintenance techniques and processes for industrial mechanics and technicians who are installing and maintaining industrial mechanical and power transmission components. **Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**
→ MEC 155 | credits  
Mechanisms  
Studies the purpose and actions of cams, gear trains, levers, and other mechanical devices used to transmit control. Focuses on motions, linkages, velocities, and acceleration of points within a link mechanism; layout method for designing cams and gear trains. Requires preparation of weekly laboratory reports. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ MEC 268 | 3 credits  
Fluid Power - Hydraulic Systems  
Studies hydraulic components and their integration into complex systems including system analysis and troubleshooting. Introduces design considerations necessary for repair and modification. Covers closed-loop control and proportional valves with electronic control. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ MEC 269 | 3 credits  
Fluid Power - Pneumatic Systems  
Teaches pneumatic components, systems and trouble analysis. Introduces basic design for modification and repair. Covers open-loop control, fluidics, robotics and computer controls. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

→ MDL 101 | 3 credits  
Introduction to Medical Laboratory Techniques  
Introduces the basic techniques including design of the health care system, ethics, terminology, calculations, venipuncture and routine urinalysis. Prerequisite: Admission into program. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MDL 105 | 3 credits  
Phlebotomy  
Introduces basic medical terminology, anatomy, physiology, components of health care delivery and clinical laboratory structure. Teaches techniques of specimen collection, specimen handling, and patient interactions. Prerequisite: Instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week for 16 weeks; 10 hours per week for 8 weeks.

→ MDL 106 | 4 credits  
Clinical Phlebotomy  
Focuses on obtaining blood specimens, processing specimens, managing assignments, assisting with and/or performing specified tests, performing clerical duties and maintaining professional communication. Provides supervised learning in college laboratory and/or cooperating agencies. Prerequisite: Instructor permission. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week for 16 weeks; 16 hours per week for 8 weeks.

→ MDL 125 | 3 credits  
Clinical Hematology I  
Teaches the cellular elements of blood including blood cell formation, and routine hematological procedures. Prerequisite: Admission into program. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MDL 210 | 2 credits  
Immunology and Serology  
Teaches principles of basic immunology, physiology of the immune system, diseases involving the immune system, as well as serologic procedures. Prerequisite: Admission into program. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ MDL 216 | 3 credits  
Blood Banking  
Teaches fundamentals of blood grouping and typing, compatibility testing, antibody screening, component preparation, donor selection, and transfusion reactions and investigation. Prerequisite: Admission into program. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MDL 225 | 3 credits  
Clinical Hematology II  
Teaches advanced study of blood to include coagulation, abnormal bloody formation, and changes seen in various diseases. Prerequisite: Admission into program. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ MDL 251 | 3 credits  
Clinical Microbiology I  
Teaches handling, isolation, and identification of pathogenic microorganisms. Emphasizes clinical techniques of bacteriology, mycology, parasitology and virology. Part I of II. Prerequisite: Admission into program. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.
→ MDL 252 | 2 credits  
**Clinical Microbiology II**  
Teaches handling, isolation, and identification of pathogenic microorganisms. Emphasizes clinical techniques of bacteriology, mycology, parasitology and virology. Part II of II. **Prerequisite:** Admission into program. **Lecture** 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ MDL 261 | 4 credits  
**Clinical Chemistry and Instrumentation I**  
Introduces methods of performing biochemical analysis of clinical specimens. Teaches instrumentation involved in a clinical chemistry laboratory, quality control, and the ability to recognize technical problems. Part I of II. **Prerequisite:** Admission into program. **Lecture** 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ MDL 265 | 2 credits  
**Advanced Clinical Chemistry**  
Presents principles of current special chemistry techniques. **Prerequisite:** Admission into program. **Lecture** 2 hours per week.

→ MDL 266 | 3 credits  
**Clinical Chemistry Techniques**  
Includes performing of clinical chemistry methodologies and operation of typical instrumentation in a clinical laboratory or simulated laboratory setting. **Prerequisite:** Admission into program. Laboratory 9 hours per week.

→ MDL 276 | 3 credits  
**Clinical Hematology Techniques**  
Stresses performing hematological and coagulation methods and operation of typical instrumentation in a clinical laboratory or simulated laboratory setting. **Prerequisite:** Admission into program. Laboratory 9 hours per week.

→ MDL 277 | 4 credits  
**Clinical Blood Banking Techniques**  
Provides training in techniques, procedures, and interpretations in Blood Banking in a clinical laboratory or simulated laboratory setting. **Prerequisite:** Admission into program. Laboratory 12 hours per week.

→ MDL 278 | 4 credits  
**Clinical Microbiology Techniques II**  
Includes performing of techniques, procedures, and identification of microorganisms in a clinical laboratory or simulated laboratory setting. **Prerequisite:** Admission into program. Laboratory 12 hours per week.

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### MILITARY SCIENCES

→ MSC 111 | 2 credits  
**Introduction to Army ROTC**  
Covers the first year of general military science: organization of the Army and ROTC, U.S. Army and national security, individual weapons, marksmanship, and leadership laboratory. Courses offered only in cooperation with four-year colleges authorized to offer Army ROTC programs. Part I of II. **Lecture** 2 hours per week.

→ MSC 112 | 2 credits  
**Introduction to Leadership**  
Covers the first year of general military science: organization of the Army and ROTC, U.S. Army and national security, individual weapons, marksmanship, and leadership laboratory. Courses offered only in cooperation with four-year colleges authorized to offer Army ROTC programs. Part II of II. **Lecture** 2 hours per week.

→ MSC 125 | 3 credits  
**Sea Power and Maritime Affairs**  
Provides an in-depth assessment of the broad principles, concepts and elements of sea power with historical and modern applications to the United States and other world powers. **Lecture** 3 hours per week.

→ MSC 130 | 3 credits  
**Introduction to Naval Science**  
Provides an introduction for midshipmen to the organization of the naval service, the varied career opportunities available, the long-held customs and traditions of the service, basic leadership, ethics and character development, the duties of a junior officer and Navy policies on wellness issues. Prepares NROTC midshipmen for their first experience onboard a Navy ship by imparting basic information concerning shipboard procedures and safety. **Lecture** 3 hours per week.

→ MSC 132 | 1 credit  
**Naval Science Laboratory I**  
Introduces basic military formations, drill movements, commands, customs, courtesies, honors and inspections. Covers applications of naval service concepts and principles in cruise preparation, shipboard safety, security, equal opportunity and military justice. First year Naval Science students only. May be repeated for credit. **Co-requisite:** MSC 125 and/or MSC 130. Laboratory 2 hours per week.
→ MSC 211  l  2 credits  
**Leadership Skills**
Focuses on the second year of general military science: American military history, introduction to operations and basic tactics, map and aerial photo reading, and leadership laboratory. Courses offered only in cooperation with four-year colleges authorized to offer Army ROTC programs. Part I of II. **Lecture 2 hours per week.**

→ MSC 212  l  2 credits  
**Foundations of the Military Profession**
Focuses on the second year of general military science: American military history, introduction to operations and basic tactics, map and aerial photo reading, and leadership laboratory. Courses offered only in cooperation with four-year colleges authorized to offer Army ROTC programs. Part II of II. **Lecture 2 hours per week.**

→ MSC 230  l  3 credits  
**Naval Ship Systems I: Naval Engineering**
Provides an understanding of the physical properties and laws of thermodynamic systems, shipboard auxiliary systems, main propulsion, and electrical theory of shipboard power generation and distribution systems. Examines the criteria of ship design for seaworthiness, structural integrity and operational employment, the principles of fluid dynamics and shipboard safety. **Lecture 3 hours per week.**

→ MSC 231  l  3 credits  
**Naval Ship Systems II: Weapons**
Provides an in-depth understanding of Naval Weapons, their associated systems, and the integration of these weapon systems into the overall naval strategy. **Lecture 3 hours per week.**

→ MSC 232  l  1 credit  
**Naval Science Laboratory II**
Builds on skills and knowledge of basic military formations, drill movements, commands, customs, courtesies, honors and inspections. Covers applications of naval service concepts and principles to ship design for seaworthiness, shipboard safety, systems administration, and naval strategy. Second year Naval Science students only. May be repeated for credit. **Co-requisite: MSC 230 and/or MSC 231. Laboratory 2 hours per week.**

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**MUSIC**

→ MUS 101-102  l  3 credits each  
**Basic Musicianship I-II**
Provides exercises leading to knowledge and skill in the rudiments of music. Includes rhythmic notation as well as scales, keys, and intervals along with exercises in sight reading and ear training. **Lecture 3 hours per week.**

→ MUS 111-112  l  4 credits each  
**Music Theory I-II**
Discusses elements of musical construction of scales, intervals, triads, and chord progressions. Develops ability to sing at sight and write from dictation. Introduces the analysis of the Bach chorale style. Expands facility with harmonic dictation and enables the student to use these techniques at the keyboard. **Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.**

→ MUS 121-122  l  3 credits each  
**Music Appreciation I-II**
Increases the variety and depth of the student's interest, knowledge, and involvement in music and related cultural activities. Acquaints the student with traditional and twentieth century music literature, emphasizing the relationship music has as an art form with man and society. Increases the student's awareness of the composers and performers of all eras through listening and concert experiences. **Lecture 3 hours per week.**

→ MUS 125  l  3 credits  
**American Music**
Presents the development of music in America from early colonists to the present, in light of philosophical, political, geographical, and sociological developments. **Lecture 3 hours per week.**

→ MUS 131-132  l  2 credits each  
**Class Voice I-II**
Introduces the many aspects of singing from the physical act through the aesthetic experience. The course is designed for the beginning singer who desires vocal improvement, and for the voice major as an addition to and extension of skills and knowledge necessary for artistic development. Introduces appropriate repertoire. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**
→ **MUS 135 | 1 credit**  
**Jazz Ensemble**  
Consists of performance from Standard Jazz and American Songbook Repertoires, including study of ensemble techniques, interpretation, and improvisation. Divisional approval required. May be repeated for credit. Laboratory 3 hours per week.

→ **MUS 136 | 2 credits**  
**Applied Music - Voice**  
Teaches singing, proper breath control, diction, and development of tone. Studies the standard vocal repertoire. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ **MUS 137 | 1 credit**  
**Chorus Ensemble**  
Ensemble consists of performance from the standard repertoires, including study of ensemble techniques and interpretation. May be repeated for credit. Laboratory 3 hours per week.

→ **MUS 145 | 2 credits**  
**Applied Music - Keyboard**  
Teaches piano, organ, harpsichord, or synthesizer. Studies the standard repertoire. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ **MUS 146 | 1 credit**  
**Percussion Ensemble**  
Consists of performance on a variety of percussion instruments. Studies performance techniques of various percussion instruments and interpretation of percussion parts and scores. Divisional approval required. May be repeated for credit. Laboratory 3 hours per week.

→ **MUS 155 | 2 credits**  
**Applied Music - Woodwinds**  
Teaches fundamentals of the woodwind instruments. Studies the standard repertoire. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ **MUS 163 | 3 credits**  
**Guitar Theory and Practice I**  
Studies the fundamentals of sound production, music theory, and harmony as they apply to guitar. Builds proficiency in both the techniques of playing the guitar and in the application of music fundamentals to these techniques. Presents different types of guitars and related instruments. Emphasizes music as entertainment and as a communication skill. Part I of II. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ **MUS 165 | 2 credits**  
**Applied Music - Strings**  
Teaches fundamentals of string instruments, harp, or guitar. Studies the standard repertoire. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ **MUS 166 | 2 credits**  
**String Ensemble**  
Performs standard string ensemble repertoire. Studies ensemble techniques and interpretation. May be repeated for credit. Laboratory 6 hours per week.

→ **MUS 175 | 2 credits**  
**Applied Music - Brass**  
Teaches fundamentals of brass instruments. Studies the standard repertoire. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ **MUS 185 | 2 credits**  
**Applied Music - Percussion**  
Teaches fundamentals of percussion instruments. Studies the standard repertoire. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ **MUS 211 | 4 credits**  
**Advanced Music Theory I**  
Increases facility in the analysis and usage of diatonic and chromatic harmonies. Continues harmonic analysis of Bach style. Includes exercises in sight-singing, ear-training, and keyboard harmony. **Prerequisites:** MUS 111 or equivalent. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

→ **MUS 221-222 | 3 credits each**  
**History of Music I-II**  
Presents the chronology of musical styles from antiquity to the present time. Relates the historical development of music to parallel movements in art, drama, and literature. Develops techniques for listening analytically and critically to music. Lecture 3 hours per week.
→ MUS 236 | 2 credits
Advanced Applied Music - Voice
Continues MUS 136. May be repeatable for credit up to 8 hours with special permission. Prerequisite: Divisional approval. Two half-hour lessons per week. 4 hours practice required.

→ MUS 237 | 1 credit
Advanced Chorus Ensemble
Ensemble consists of performance from the standard repertoires, including study of ensemble techniques and interpretation. May be repeated for credit. Continues MUS 137. Laboratory 3 hours per week.

→ MUS 239 | 1 credit
Advanced Jazz Ensemble
Consists of performance from Standard Jazz and American Songbook Repertoires, including study of ensemble techniques, interpretation, and improvisation. May be repeated for credit. Prerequisite: Divisional approval and completion of Jazz Ensemble. Laboratory 3 hours per week.

→ MUS 245 | 2 credits
Advanced Applied Music - Keyboard
Continues MUS 145. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ MUS 255 | 1-2 credits
Advanced Applied Music - Woodwinds
Continues Applied Music - Woodwinds MUS 155. Private lessons are available for either 1 or 2 hours of credit per semester. The length of the lessons will be 1/2 hour for 1 hour credit and 1 hour for 2 hours credit per semester. All courses in applied music may be repeated for a total of 8 hours for the major and 4 hours for the minor. Laboratory 4-8 hours per week.

→ MUS 265 | 2 credits
Advanced Applied Music - Strings
Continues MUS 165. May be repeatable for credit up to 8 hours with special permission. Two half-hour lessons per week. 4 hours practice required.

→ MUS 266 | 2 credits
Advanced String Ensemble
Performs standard string ensemble repertoire. Studies ensemble techniques and interpretation. May be repeated for credit. Prerequisite: MUS 166 or permission of instructor. Laboratory 6 hours per week.

→ MUS 275 | 1-2 credits
Advanced Applied Music - Brass
Continues Applied Music Brass MUS 175. Private lessons are available for either 1 or 2 hours of credit per semester. The length of the lessons will be 1/2 hour for 1 hour credit and 1 hour for 2 hours credit per semester. All courses in applied music may be repeated for a total of 8 hours for the major and 4 hours for the minor. Prerequisite: Divisional approval. Laboratory 1-2 hours per week.

→ MUS 285 | 1-2 credits
Advanced Applied Music - Percussion
Continues Applied Music - Percussion MUS 185. Private lessons are available for either 1 or 2 hours of credit per semester. The length of the lessons will be 1/2 hour for 1 hour credit and 1 hour for 2 hours credit per semester. All courses in applied music may be repeated for a total of 8 hours for the major and 4 hours for the minor. Prerequisite: Divisional approval. Laboratory 1-2 hours per week.

NATURAL SCIENCE

→ NAS 2 | 2 credits
Foundations of Life Sciences
Presents elementary biological and chemical principles for allied health students whose high school preparation is deficient in the biological sciences. Lecture 2 hours per week.

→ NAS 115 | 3 credits
Introductory Meteorology
Studies cloud formation, weather maps, forecasting, and wind systems with emphasis on local weather patterns. Lecture 3 hours per week.

→ NAS 120 | 3 credits
Science in the Workplace
Explores concepts of basic physical sciences as they apply to the workplace. Presents scientific methods, energy, heat, and temperature as related to various materials used in the workplace. Designed for trade workers that work with a variety of materials in many different applications. Assists workers with the physical properties of materials as they relate to various manufacturing methods. Lecture 3 hours per week.
→ **NAS 125 | 4 credits**  
**Meteorology**  
Presents a non-technical survey of fundamentals of meteorology. Focuses on the effects of weather and climate on humans and their activities. Serves for endorsement or recertification of earth science teachers. **Lecture 3 hours. Recitation and laboratory 2 hours. Total 5 hours per week.**

→ **NAS 130 | 4 credits**  
**Elements of Astronomy**  
Covers history of astronomy and its recent developments. Stresses the use of astronomical instruments and measuring techniques and includes the study and observation of the solar system, stars, and galaxies. **Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.**

→ **NAS 131-132 | 4 credits each**  
**Astronomy I-II**  
Studies the major and minor bodies of the solar system, stars and nebulae of the Milky Way, and extragalactic objects. Examines life and death of stars, origin of the universe, history of astronomy, and instruments and techniques of observation. **Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.**

→ **NAS 177 | 2 credits**  
**Upper Extremity Anatomy and Kinesiology**  
Focuses on the upper extremity anatomy to include the entire shoulder girdle and the impact of pathology and injury related to the skeletal, nervous and muscular systems. Covers planes of movement of the upper extremity associated with basic physics and types of levers. **Prerequisite: Admission into program. Lecture 2 hours per week.**

→ **NUR 90 | 1-5 credits**  
**Coordinated Internship**  
Supervises on-the-job training in selected business, industrial or service firms coordinated by the college. **Co-requisite: NUR 27. Credit/practice ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours.**

→ **NUR 103 | 2 credits**  
**Clinical Reasoning in Current Nursing Practice**  
Discusses clinical reasoning and the critical thinking process used in nursing. Incorporates practical reasoning, which complements the scientific reasoning used in the nursing process. Forms the basis for the thinking process applied throughout all nursing courses. **Lecture 2 hours. Total 2 hours per week.**

→ **NUR 106 | 6 credits**  
**Nursing Principles and Health Assessment**  
Introduces principles of nursing, health and wellness concepts, and the nursing process. Identifies nursing strategies to meet the needs of individuals across the life span based on Maslow’s Hierarchy of Needs. Content includes basic principles of medication administration, math computation skills, nutrition, sleep and rest, growth and development, documentation, elimination, oxygenation and communication. Acquisition of a health history and physical assessment are taught incorporating lifespan concepts. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. **Lecture 3 hours. Laboratory 9 hours. Total 12 hours per week.**

→ **NUR 108 | 6 credits**  
**Nursing Principles and Concepts I**  
Introduces principles of nursing, health and wellness concepts, and the nursing process. Identifies nursing strategies to meet the multidimensional needs of individuals. Includes math computational skills, basic computer instruction related to the delivery of nursing care, introduction to the profession of nursing, nursing process, documentation; basic needs related to integumentary system, teaching/learning, stress, psychosocial, safety, nourishment, elimination, oxygenation, circulation, rest, comfort, sensory, fluid and electrolyte and mobility needs in adult clients. Also includes care of the pre/post operative client. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. **Prerequisite: Admission into program. Lecture 3 hours. Laboratory 9 hours. Total 12 hours per week.**
→ **NUR 113** | 7 credits  
First Level Nursing I  
Focuses on the assessment and nursing care of individuals across the lifespan experiencing common, well-defined, and predictable alterations along the health continuum. Includes math computational skills, basic computer instruction related to the delivery of nursing care; medication administration; communication techniques; introduction to child health; care of the perioperative client; and methods and techniques used in the assessment of the respiratory, cardiac, gastrointestinal and genitourinary systems. Lecture 3 hours. Laboratory 12 hours. Total 15 hours per week.

→ **NUR 115** | 7 credits  
LPN Transition  
Introduces the role of the registered nurse through concepts and skill development in the discipline of professional nursing. This course serves as a bridge course for licensed practical nurses and is based upon individualized articulation agreements, mobility exams, or other assessment criteria as they relate to local programs and service areas. Includes math computational skills and basic computer instruction related to the delivery of nursing care. Prerequisite: Admission into program. Lecture 4 hours. Laboratory 9 hours. Total 13 hours per week.

→ **NUR 130** | credits  
Physical Assessment and Basic Pharmacology  
Teaches a systematic approach to performing physical assessment skills and basic pharmacological concepts. Includes basic principles of data collection and basic analysis using skills of interviewing and techniques of inspection, palpation, percussion and auscultation. Principles of pharmacology include dosage calculations, major drug classifications, drug legislation, legal aspects of medication administration, drug action on specific body systems, and basic computer applications. Provides supervised learning experiences in a college laboratory. Prerequisites: Admission into program and NUR 108. Lecture 1 hour. Laboratory 6 hours. Total 7 hours per week.

→ **NUR 136** | 1 credit  
Principles of Pharmacology I  
Focuses on principles of medication administration which include dosage calculations, major drug classifications, drug legislation, legal aspects of medication administration, drug action on specific body systems, and basic computer applications. Lecture 1 hour per week.

→ **NUR 170** | 4 credits  
Essentials of Medical/Surgical Nursing  
Focuses on the care of individuals/families requiring medical or surgical treatment. Uses all components of the nursing process with increasing degrees of skill. Includes mathematical computational skills and basic computer instruction related to the delivery of nursing care. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. Prerequisites: Admission into program, NUR 108 and NUR 130. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

→ **NUR 180** | 4 credits  
Essentials of Maternal/Newborn Nursing  
Utilizes the concepts of the nursing process in caring for families in the antepartum, intrapartum, and postpartum periods. Includes math computational skills and basic computer instruction related to the delivery of nursing care. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. Prerequisites: Admission into program and NUR 170. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

→ **NUR 200** | 3 credits  
Essentials of Mental Health Nursing  
Utilizes the concepts of the nursing process in caring for individuals, families, and/or groups with mental health needs across the life span. Includes math computational skills and basic computer instruction related to the delivery of nursing care. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ **NUR 201** | 4 credits  
Psychiatric Nursing  
Focuses on the care of individuals/families requiring clinical treatment. Uses all components of the nursing process with increasing degrees of skill. Includes math computational skills and basic computer instruction related to the delivery of nursing care, alterations in behavior, eating disorders, mood disorders, anxiety, chemical dependency and dementias. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. Prerequisites: Admission into program and NUR 180. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.
→ **NUR 213 | 7 credits**  
**Second Level Nursing III**  
Emphasizes complex nursing care of individuals, families, and/or groups in various stages of development who are experiencing alterations related to their biopsychosocial needs. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care; cardiovascular, respiratory, endocrine, neurological and renal disorders. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. **Lecture 3 hours. Laboratory 12 hours. Total 15 hours per week.**

→ **NUR 215 | 6 credits**  
**Transition to Nursing Practice**  
Focuses on the care of diverse patients with complex health issues. Incorporates communication, collaboration, caring, and critical thinking/clinical reasoning necessary for safe, patient-centered nursing care. Integrates evidence-based practice, quality improvement, professional standards, and legal and ethical responsibilities of the entry level nurse. Provides a precepted clinical experience to facilitate an effective transition from student to registered nurse. **Lecture 3 hours. Laboratory 9 hours. Total 12 hours per week.**

→ **NUR 245 | 3 credits**  
**Maternal/Newborn Nursing**  
Develops nursing skills in caring for families in the antepartum, intrapartum, and post-partum periods. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **NUR 246 | 3 credits**  
**Parent/Child Nursing**  
Develops nursing skills in caring for both well and ill children in a variety of settings. Emphasizes theories of growth and development and the family as a unit. **Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.**

→ **NUR 255 | 3 credits**  
**Nursing Organization and Management**  
Addresses management and organizational skills as they relate to nursing. Emphasizes group dynamics, resolution of conflicts, and leadership styles. **Prerequisites: Admission into program and NUR 271. Lecture 3 hours per week.**

→ **NUR 270 | 4 credits**  
**Essential Nursing Concepts II**  
Focuses on complex nursing care of individuals, families and/or groups in various stages of development who are experiencing alterations related to their biopsychosocial needs. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having fluid and electrolyte imbalance related to inflammatory bowel disease, intestinal obstruction, peptic ulcer disease and cirrhosis; altered regulatory hormonal mechanism related to endocrine disorders; altered inflammatory process related to STD/AIDS, endocarditis, rheumatic fever/valvular disorders and pancreatitis. Provides supervised learning in college nursing laboratories and/or cooperating agencies. **Prerequisites: Admission into program and NUR 201. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **NUR 271 | 4 credits**  
**Essential Nursing Concepts III**  
Focuses on complex nursing care of individuals, families and/or groups in various stages of development who are experiencing alterations related to their biopsychosocial needs. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having altered transport to and from cells related to anemia, hemophilia, hypertension, coronary artery disease, heart failure, cystic fibrosis; abnormal proliferation and maturation of cells related to cancer. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. **Prerequisites: Admission into program and NUR 270. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**

→ **NUR 272 | 4 credits**  
**Essential Nursing Concepts IV**  
Focuses on complex nursing care of individuals, families and/or groups with multidimensional needs in a variety of settings. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having altered transport to and from cells related to tuberculosis, chronic obstructive pulmonary disease, croup, congenital heart defects, peripheral vascular disease, brain attack, chest injuries; altered neural regulatory mechanisms related to meningitis, spinal cord injury, spina bifida, myelomeningocele, scoliosis, seizure disorder, Parkinson’s disease; altered sensory motor function related to multiple sclerosis. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. **Prerequisites: Admission into program and NUR 271. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.**
→ **NUR 273 | 4 credits**  
**Essential Nursing Concepts V**  
Focuses on complex nursing care of individuals, families and/or groups with multidimensional needs in a variety of settings. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having abnormal proliferation and maturation of cells related to cancer; altered fluid and electrolyte imbalance related to burns, renal failure, nephritic syndrome, glomerulonephritis; multi-system disorders. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. 
**Prerequisites:** Admission into program and NUR 272. Co-requisite: NUR 255. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

→ **NUR 299 | 1 credit**  
**Supervised Study in Nursing Perspectives**  
Focuses on seminar discussions, selected clinical simulation, and independent study to enhance critical thinking in the nursing process. Promotes synthesis of simple to complex concepts gained throughout the program through use of the nursing process in care of clients across the lifespan. 
**Laboratory** 3 hours per week.

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**OCCUPATIONAL THERAPY**

→ **OCT 100 | 3 credits**  
**Introduction to Occupational Therapy**  
Introduces the concepts of occupational therapy as a means of directing a person's participation in tasks selected to develop, maintain or restore skills in daily living. Examines the role of the assistant for each function of occupational therapy, and for various practice settings in relationship to various members of the health care team. 
**Prerequisite:** Admission into program. Lecture 3 hours per week.

→ **OCT 201 | 3 credits**  
**Occupational Therapy with Psychosocial Dysfunction**  
Focuses on the theory and application of occupational therapy in the evaluation and treatment of psychosocial dysfunction. Includes a survey of conditions which cause emotional, mental, and social disability, as well as the role of the occupational therapy assistant in the assessment, planning and implementation of treatment programs. 
**Prerequisite:** Admission into program. Lecture 3 hours per week.

→ **OCT 202 | 4 credits**  
**Occupational Therapy with Physical Disabilities**  
Focuses on the theory and application of occupational therapy in the evaluation and treatment of physical dysfunction. Includes a survey of conditions which cause physical disability as well as the role of the occupational therapy assistant in assessment, planning and implementation of treatment programs. 
**Prerequisite:** Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ **OCT 203 | 4 credits**  
**Occupational Therapy with Developmental Disabilities**  
Focuses on the theory and application of occupational therapy in the evaluation and treatment of developmental dysfunction. Includes a survey of conditions which cause developmental disability across the life span, with particular emphasis on children and the elderly. Investigates the role of the occupational therapist in assessment, planning and implementation of treatment programs. 
**Prerequisite:** Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ **OCT 205 | 2 credits**  
**Therapeutic Media**  
Develops proficiency in various crafts used as treatment modalities in occupational therapy. Emphasizes how to analyze, adapt and teach selected activities as well as how to equip and maintain a safe working environment. 
**Prerequisite:** Admission into program. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ **OCT 206 | 3 credits**  
**Dyadic and Group Dynamics**  
Provides theory and activity to develop positive interpersonal relationships and effective communication ability. Includes non-verbal communication, listening, observation, interviewing and documentation. Covers group process and its application to occupational therapy, including types of therapeutic groups, group membership roles, leadership skills and forces which affect group function and decision making. 
**Prerequisite:** Admission into program. Lecture 3 hours per week.
→ OCT 207  |  4 credits
Therapeutic Skills
Presents techniques used in the treatment of a variety of conditions frequently seen across the life span. Emphasizes the activities of self-care, work, and leisure as they relate to the development/resumption of normal social role functioning. Prerequisite: Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ OCT 208  |  3 credits
Occupational Therapy Service Management
Presents principles and techniques of management appropriate to the occupational therapy assistant. Includes roles and functions of the supervisor and the supervisee, scheduling, billing, and quality improvement. Issues relevant to professional practice and patient care will be discussed with similarities and differences between various facilities highlighted. Prerequisite: Admission into program. Lecture 3 hours per week.

→ OCT 210  |  2 credits
Assistive Technology in Occupational Therapy
Explores the assistive technologies available for persons with physical, sensory and cognitive disabilities. Provides instruction in the process of assessment, selection adaptation and training of assistive technology to persons with a disability. Presents information on funding and maintenance of devices. Exposes students to technology in clinical practice and equipment companies. Prerequisite: Admission into program. Lecture 2 hours per week.

→ OCT 220  |  2 credits
Occupational Therapy for the Adult
Reviews normal changes related to aging and factors contributing to dysfunction. Analyzes intervention strategies for common problems, including wellness programs and home modifications. Reviews relevant legislation, continuum of care and caregiver issues. Prerequisite: Admission into program. Lecture 2 hours per week.

→ OCT 225  |  4 credits
Neurological Concepts for Occupational Therapy Assistants
Focuses on the workings of the human nervous system from the cellular level to the systems level with an emphasis on normal neurological function, the impact of neurological dysfunction, and how to use neurological rehabilitation techniques to facilitate the rehabilitation process across the lifespan. Prerequisite: Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

PHILOSOPHY

→ PHI 101-102  |  3 credits each
Introduction to Philosophy I-II
Introduces a broad spectrum of philosophical problems and perspectives with an emphasis on the systematic questioning of basic assumptions about meaning, knowledge, reality, and values. Lecture 3 hours per week.

→ PHI 111  |  3 credits
Logic I
Introduces inductive and deductive reasoning, with an emphasis on common errors and fallacies. Lecture 3 hours per week.

→ PHI 115  |  3 credits
Practical Reasoning
Studies informal logic and language techniques as they relate to reasoning and argument. Provides practice in analyzing arguments and constructing sound arguments. Lecture 3 hours per week.

PHOTOGRAPHY

→ PHT 101  |  3 credits
Photography I
Teaches principles of photography and fundamental camera techniques. Requires outside shooting and laboratory work. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.
→ **PHT 110 | 3 credits**  
**History of Photography**  
Surveys important photographers, processes, and historical influences of the nineteenth and twentieth centuries.  
Lecture 3 hours per week.

→ **PHT 126 | 3 credits**  
**Introduction to Video Techniques**  
Concentrates on skills necessary to light, edit, and record on video tape. Covers situations such as weddings, meetings, and small corporate productions. **Prerequisite: PHT 101.**  
Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ **PHT 135 | 3 credits**  
**Electronic Darkroom**  
Teaches students to create and manipulate digital photographs. Covers masking, color corrections, and merging of illustrations with photographs. Examines the ethical and property-rights issues which are raised in the manipulation of images. **Prerequisite: PHT 101.**  
Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ **PHT 171 | 3 credits**  
**Imaging and Concepts in Photographic Media Arts**  
Covers best practices in imaging workflows, concept building, ideation, and steps in the creative process. Introduces students to working with multiple images in a series and as sequence. Provides students the opportunity to create and manipulate digital images and examine property-rights issues. Exposes students to a variety of software used for image organization, archiving, image editing, compositing, layer masking, the application of special effects, and outsourcing. **Prerequisite: PHT 101.**  
Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

→ **PHT 201 | 3 credits**  
**Advanced Photography I**  
Provides weekly critiques of students’ work. Centers on specific problems found in critiques. Includes working procedures and critical skills in looking at photographs. **Prerequisite: PHT 135 or PHT 171.**  
Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ **PHT 221-222 | 3 credits each**  
**Studio Lighting I-II**  
Examines advanced lighting and camera techniques under controlled studio conditions. Includes view camera use, electronic flash, advanced lighting techniques, color temperature and filtration, and lighting ratios. Requires outside shooting. **Prerequisite for PHT 221: PHT 135 or PHT 171. Prerequisites for PHT 222: PHT 135 or PHT 171 and PHT 221.**  
Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ **PED 100 | 2 credits**  
**Pilates**  
Provides a method of mind-body exercise and physical movement designed to stretch, strengthen, balance the body, and improve posture and core stabilization while increasing body awareness. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 101-102 | 2 credits each**  
**Fundamentals of Physical Activity I-II**  
Presents principles underlying the components of physical fitness. Utilizes conditioning activities involving cardiovascular strength and endurance, respiratory efficiency, muscular strength, and flexibility. May include fitness assessment, nutrition and weight control information, and concepts of wellness. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 103 | 2 credits**  
**Aerobic Fitness I**  
Develops cardiovascular fitness though activities designed to elevate and sustain heart rates appropriate to age and physical condition. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 105 | 2 credits**  
**Aerobic Dance I**  
Focuses on physical fitness through dance exercises. Emphasizes the development of cardiovascular endurance, muscular endurance, and flexibility. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 107 | 1 credit**  
**Exercise and Nutrition I**  
Provides for the study and application of fitness and wellness and their relationship to a healthy lifestyle. Defines fitness and wellness, evaluates the student’s level of fitness and wellness. Students will incorporate physical fitness and wellness into the course and daily living. A personal fitness/wellness plan is required for the 2 credit course. **Laboratory 2 hours. Total 2 hours per week.**
→ PED 109 | 2 credits
Yoga
Focuses on the forms of yoga training emphasizing flexibility. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 110 | 2 credits
Zumba
Focuses on Latin rhythms, dance moves and techniques in Zumba. Includes physical activity, cardiovascular endurance, balance, coordination and flexibility as related to dance. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 111-112 | 2 credits each
Weight Training I-II
Focuses on muscular strength and endurance training through individualized workout programs. Teaches appropriate use of weight training equipment. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 113 | 1 credit
Lifetime Activities I
Presents lifetime sports and activities. Teaches skills and methods of lifetime sports and activities appropriate to the local season and facilities available. Laboratory 2 hours. Total 2 hours per week.

→ PED 116 | 2 credits
Lifetime Fitness and Wellness
Provides a study of fitness and wellness and their relationship to a healthy lifestyle. Defines fitness and wellness, evaluates the student's level of fitness and wellness, and motivates the student to incorporate physical fitness and wellness into daily living. A personal fitness/wellness plan is required for the 2-credit course. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 117 | 1 credit
Fitness Walking
Teaches content and skills needed to design, implement, and evaluate an individualized program of walking, based upon fitness level. Laboratory 2 hours. Total 3 hours per week.

→ PED 120 | 2 credits
Yoga II
Focuses on the forms of yoga training emphasizing flexibility. Prerequisite: PED 109. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 123 | 2 credits
Tennis I
Teaches tennis skills with emphasis on stroke development and strategies for individual and team play. Includes rules, scoring, terminology, and etiquette. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 129 | 2 credits
Self Defense
Examines history, techniques, and movements associated with self-defense. Introduces the skills and methods of self-defense emphasizing mental and physical discipline. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 133-134 | 2 credits each
Golf I-II
Teaches basic skills of golf, rules, etiquette, scoring, terminology, equipment selection and use, and strategy. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 135 | 2 credits
Bowling I
Teaches basic bowling skills and techniques, scoring, rules, etiquette, and terminology. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 137 | 2 credits
Martial Arts I
Emphasizes forms, styles, and techniques of body control, physical and mental discipline, and physical fitness. Presents a brief history of development of martial arts theory and practice. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 140 | 2 credits
Water Aerobics
Focuses on cardiovascular endurance, muscular endurance, and flexibility using water resistance. Includes the principles and techniques of aerobic exercise. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

→ PED 141 | 2 credits
Swimming I
Introduces skills and methods of swimming strokes. Focuses on safety and physical conditioning. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.
→ **PED 152 | 2 credits**  
**Basketball**  
Introduces basketball skills, techniques, rules, and strategies. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 168 | 3 credits**  
**Basic Personal Trainer Preparation**  
Introduces the skills and knowledge required to become a personal trainer. Includes the principles of individual weight management, personal wellness, and the skills necessary for the creation of a fitness program for potential clients. **Prerequisite: Instructor Approval. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.**

→ **PED 170 | 2 credits**  
**Tai Chi I**  
Develops an understanding of the theories and practices of Tai Chi. Explores the energy of exercise that will tone muscles, improve circulation and increase flexibility and balance. Discusses history and philosophy of exercise and relaxation techniques for stress reduction. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 171 | 2 credits**  
**Ballroom Dance I**  
Presents the basic step patterns, rhythmic patterns, and positions in ballroom dance. Includes techniques based upon traditional steps with basic choreographic patterns. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 172 | 2 credits**  
**Ballroom Dance II**  
Presents the basic step patterns, rhythmic patterns, and positions in ballroom dance. Includes techniques based upon traditional steps with basic choreographic patterns. Part II of II. **Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.**

→ **PED 206 | 2 credits**  
**Sports Appreciation**  
Focuses on the history, trends, rules, methods, strategy, and terminology of selected sports activities. Provides student awareness as a spectator and/or participant. **Lecture 2 hours per week.**

→ **PTH 105 | 3 credits**  
**Introduction to Physical Therapist Assisting**  
Introduces the physical therapist assistant student to the field of physical therapy practice and develops basic patient care skills for application in the initial physical therapy clinical experience. **Prerequisite: Admission into program or instructor permission. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.**

→ **PTH 110 | 1 credit**  
**Medical Reporting**  
Emphasizes the principles of medical reporting, including the ability to abstract pertinent information from actual medical records. Includes the writing of patient progress notes in standardized formats and medical terminology. **Prerequisites: Admission into program, PTH 105, PTH 121, PTH 151 and BIO 142 or instructor permission. Lecture 1 hour per week.**

→ **PTH 115 | 4 credits**  
**Kinesiology for the Physical Therapist Assistant**  
Focuses on the relationship of specific joint structure and function, the role of individual muscles and groups of muscles and neurologic principles in both normal and pathological movement. The course includes a review of basic physics and biomechanical principles applied to human movement. Includes specific posture and gait analysis. **Prerequisites: Admission into program, PTH 105, PTH 121, PTH 151 and BIO 142 or instructor permission. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.**

→ **PTH 121-122 | 5 credits each**  
**Therapeutic Procedures I-II**  
Prepares the students to properly and safely administer basic physical therapy procedures utilized by physical therapist assistants. The procedures include therapeutic modalities. Procedures may include therapeutic exercise, electrotherapy and cardiopulmonary rehabilitation. **Prerequisite for PTH 121: Admission into program and Qualifying Placement Test score, MTE 1-5 or equivalent, or instructor permission. Prerequisites for PTH 122: Admission into program, PTH 105, PTH 121, PTH 151 and BIO 142 or instructor permission. Lecture 3 hours. Laboratory 6 hours. Total 9 hours per week.**
→ PTH 131 | 2 credits  
Clinical Education  
Provides supervised instruction in the delivery of physical therapy in one of various clinical settings. Emphasizes the practice of all therapeutic skills learned in the first year, including direct patient care skills and all forms of communication. Prerequisites: Admission into program, PTH 105, PTH 121, PTH 151 and BIO 142 or instructor permission. Laboratory 10 hours per week.

→ PTH 151 | 5 credits  
Musculoskeletal Structure and Function  
Studies the human musculoskeletal system. Covers terms of position and movement, location, and identification of specific bony landmarks, joint structure and design, ligaments, muscle origin, action and innervation, and emphasizes types of contraction. Prerequisite: Admission into program or instructor permission. Lecture 3 hours. Laboratory 4 hours. Total 7 hours per week.

→ PTH 210 | 2 credits  
Psychological Aspects of Therapy  
Focuses on the psychological reactions and sociological impact of illness and injury in clients and their families, and among health caregivers who work with them. Examines individual self-identity and the nature of changing client/therapist relationships across the life span. Prerequisites: Admission into program, PTH 110, PTH 115, PTH 122 and PTH 131 or instructor permission. Lecture 2 hours per week.

→ PTH 225 | 5 credits  
Rehabilitation Procedures  
Focuses on treatment techniques typical of long term rehabilitation, e.g., the rehabilitation of congenital, neurological, and disfigurement associated with chronic injury and disease. Prerequisites: Admission into program, PTH 210, PTH 226 and PTH 251 or instructor permission. Lecture 3 hours. Laboratory 4 hours. Total 7 hours per week.

→ PTH 226 | 4 credits  
Therapeutic Exercise  
Emphasizes the basic principles underlying different approaches to exercise including rationale for treatment and may include neurological treatments such as simple facilitation and inhibitory techniques and the teaching of home programs. Prerequisites: Admission into program, PTH 110, PTH 115, PTH 122 and PTH 131 or instructor permission. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

→ PTH 227 | 3 credits  
Pathological Conditions  
Presents specific pathologic conditions commonly seen in physical therapy. Emphasizes musculoskeletal and neurological system conditions, and all major body systems are represented. Prerequisite: Admission into program or instructor permission. Co-requisites: PTH 210 and PTH 226. Lecture 3 hours per week.

→ PTH 251-252 | 3 credits and 4 credits  
Clinical Practicum I-II  
Provides instruction in local health care facilities in the actual administration of physical therapy treatments under the supervision of licensed physical therapists. Provides experience in a variety of clinical settings. Prerequisites for PTH 251: Admission into program, PTH 110, PTH 115, PTH 122 and PTH 131 or instructor permission. Prerequisites for PTH 252: Admission into program, PTH 210, PTH 226 and PTH 251 or instructor permission. Laboratory 15-20 hours per week.

→ PTH 255 | 2 credits  
Seminar in Physical Therapy  
Includes preparation for licensing examination, specialized lectures, and preparation of a student project. Prerequisites: Admission into program, PTH 210, PTH 226 and PTH 251 or instructor permission. Lecture 2 hours per week.

PHY 100 | 4 credits  
Elements of Physics  
Covers basic concepts of physics, including Newtonian mechanics, properties of matter, heat and sound, fundamental behavior of gases, ionizing radiation, and fundamentals of electricity. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ PHY 130 | 3 credits  
Survey of Applied Physics  
Surveys topics such as heat, electricity, and light with emphasis on practical applications. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.
PHYSICS

- **PHY 201-202 | 4 credits each**
  General College Physics I-II
  Teaches fundamental principles of physics. Covers mechanics, thermodynamics, wave phenomena, electricity and magnetism, and selected topics in modern physics.
  *Prerequisite for PHY 201: MTH 163. Prerequisites for PHY 202: PHY 201 and MTH 163. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.*

- **PHY 241-242 | 4 credits each**
  University Physics I-II
  Teaches principles of classical and modern physics. Includes mechanics, wave phenomena, heat, electricity, magnetism, relativity, and nuclear physics.
  *Prerequisite for PHY 241: MTH 173 or divisional approval. Prerequisites for PHY 242: PHY 241 and MTH 174 or divisional approval. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.*

POLITICAL SCIENCE

- **PLS 130 | 3 credits**
  Basics of American Politics
  Teaches basics of the operations of Congress, the presidency, and the federal court system. Includes civil liberties, citizenship, elections, political parties, and interest groups.
  *Lecture 3 hours per week.*

- **PLS 136 | 3 credits**
  State and Local Politics
  Teaches structure, powers and functions of state and local government in the United States.
  *Lecture 3 hours per week.*

- **PLS 211-212 | 3 credits each**
  U.S. Government I-II
  Teaches structure, operation, and process of national, state, and local governments. Includes in-depth study of the three branches of the government and of public policy.
  *Lecture 3 hours per week.*

- **PLS 225 | 3 credits**
  The United States Presidency
  Describes the modern American presidency. Focuses on the presidency and many issues related to that office; the people, the powers, and the current environment in which the presidents serve.
  *Lecture 3 hours per week.*

PSYCHOLOGY

- **PSY 105 | 3 credits**
  Psychology of Personal Adjustment
  Introduces psychological principles that contribute to well-adjusted personality. Considers the effects of stress and coping with the problems of everyday life.
  *Lecture 3 hours per week.*

- **PSY 116 | 3 credits**
  Psychology of Death and Dying
  Focuses on psychological aspects of death and dying. Teaches the meaning of death and ways of handling its personal and social implications. Includes psychological, sociological, cultural, and religious views of death.
  *Lecture 3 hours per week.*

- **PSY 126 | 3 credits**
  Psychology for Business and Industry
  Focuses on the application of psychology to interpersonal relations and the working environment. Includes topics such as group dynamics, motivation, employee-employer relationship, and interpersonal communications. May include techniques for selection and supervision of personnel.
  *Lecture 3 hours per week.*
→ **PSY 166 | 3 credits**  
**Psychology of Marriage**  
Analyzes personality interactions in marriage and other intimate relationships. Examines theories of personal development and types of relationships resulting from interactions. **Lecture 3 hours per week.**

→ **PSY 200 | 3 credits**  
**Principles of Psychology**  
Surveys the basic concepts of psychology. Covers the scientific study of behavior and mental processes, research methods and measurement, theoretical perspectives, and application. Includes biological bases of behavior, learning, social interactions, memory, and personality; and other topics such as sensation, perception, consciousness, thinking, intelligence, language, motivation, emotion, health, development, psychological disorders, and therapy. **Prerequisite:** Placement into ENG 111. **Lecture 3 hours per week.**

→ **PSY 201-202 | 3 credits each**  
**Introduction to Psychology I-II**  
Examines human and animal behavior, relating experimental studies to practical problems. Includes topics such as sensation/perception, learning, memory, motivation, emotion, stress, development, intelligence, personality, psychopathology, therapy, and social psychology. **Lecture 3 hours per week.**

→ **PSY 215 | 3 credits**  
**Abnormal Psychology**  
Explores historical views and current perspectives of abnormal behavior. Emphasizes major diagnostic categories and criteria, individual and social factors of maladaptive behavior, and types of therapy. Includes methods of clinical assessment and research strategies. **Prerequisite:** PSY 200, PSY 201 or PSY 202. **Lecture 3 hours per week.**

→ **PSY 216 | 3 credits**  
**Social Psychology**  
Examines individuals in social contexts, their social roles, group processes and intergroup relations. Includes topics such as small group behavior, social behavior, social cognition, conformity, attitudes, and motivation. **Prerequisite:** PSY 200, PSY 201 or PSY 202. **Lecture 3 hours per week.**

→ **PSY 230 | 3 credits**  
**Developmental Psychology**  
Studies the development of the individual from conception to death. Follows a life-span perspective on the development of the person's physical, cognitive, and psychosocial growth. **Lecture 3 hours per week.**

→ **PSY 231-232 | 3 credits each**  
**Life Span Human Development I-II**  
Investigates human behavior through the life cycle. Describes physical, cognitive, and psychosocial aspects of human development from conception to death. **Lecture 3 hours per week.**

→ **PSY 235 | 3 credits**  
**Child Psychology**  
Studies development of the child from conception to adolescence. Investigates physical, intellectual, social and emotional factors involved in the child’s growth. **Lecture 3 hours per week.**

→ **PSY 236 | 3 credits**  
**Adolescent Psychology**  
Studies development of the adolescent. Investigates physical, intellectual, social, and emotional factors of the individual from late childhood to early adulthood. **Lecture 3 hours per week.**

→ **PSY 255 | 3 credits**  
**Psychological Aspects of Criminal Behavior**  
Studies psychology of criminal behavior. Includes topics such as violent and non-violent crime, sexual offenses, insanity, addiction, white collar crime, and other deviant behaviors. Provides a background for law enforcement occupations. **Prerequisite:** PSY 125, PSY 200, PSY 201, PSY 202 or divisional approval. **Lecture 3 hours per week.**

→ **PSY 270 | 3 credits**  
**Psychology of Human Sexuality**  
Focuses on scientific investigation of human sexuality and psychological and social implications of such research. Considers sociocultural influences, the physiology and psychology of sexual response patterns, sexual dysfunctions, and development of relationships. **Prerequisite:** PSY 200, PSY 201 or PSY 202. **Lecture 3 hours per week.**
PUBLIC SERVICE

→ PBS 265 | 3 credits
Interviewing
Analyzes the principles and techniques of interviewing in various organizational settings. Examines reliability and validity of information gained through information interviewing, employment and selection interviewing, performance appraisal and disciplinary interviewing, as well as counseling interviewing. Lecture 3 hours per week.

RADIOGRAPHY

→ RAD 120 | 3 credits
Medical Care Procedures & Safety in Radiology
Teaches the fundamentals of radiation safety, body mechanics and medical legal considerations in Radiology. Presents techniques in infection control, patient care safety, and response to emergency situations. Introduces pharmacology, contrast media, and treatment of adverse reactions. Students acquire skills in vital sign assessment, sterile technique, venipuncture, and other medical care procedures. Prerequisite: Admission into program. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ RAD 121 | 4 credits
Radiographic Procedures I
Introduces procedures for positioning the patient’s anatomical structures relative to X-ray beam and image receptor. Emphasizes procedures for routine examination of the chest, abdomen, extremities, and axial skeleton. Prerequisite: Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ RAD 121-122 | 3 credits each
Elementary Clinical Procedures I-II
Develops advanced technical skills in fundamental radiographic procedures. Focuses on manipulation of equipment, patient care, osseous studies, skull procedures, and contrast studies. Provides clinical experience in cooperating health agencies. Prerequisite: Admission into program. Clinical 15 hours per week.

→ RAD 141-142 | 4 credits each
Principles of Radiographic Quality I-II
Presents factors that control and influence radiographic quality, as well as various technical conversion factors useful in radiography. Discusses automatic film processing, sensitometry, and quality assurance testing. Prerequisite: Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ RAD 205 | 3 credits
Radiation Protection and Radiobiology
Studies methods and devices used for protection from ionizing radiation. Teaches theories of biological effects, cell and organism sensitivity, and the somatic and genetic effects of ionizing radiation. Presents current radiation protection philosophy for protecting the patient and technologist. Prerequisite: Admission into program. Lecture 3 hours per week.

→ RAD 206 | 2 credits
Human Disease and Radiography
Introduces the various diseases and anomalies that may be manifested on the radiograph. Presents diseases related to the various body systems. Places emphasis on the relationship of the disease process and radiographic density. Prerequisite: Admission into program. Lecture 2 hours per week.

→ RAD 221 | 4 credits
Radiographic Procedures II
Continues procedures for positioning the patient’s anatomical structures relative to X-ray beam and image receptor. Emphasizes procedures for routine examination of the skull, contrast studies of internal organs, and special procedures employed in the more complicated investigation of the human body. Prerequisite: Admission into program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

→ RAD 231-232 | 5 credits each
Advanced Clinical Procedures I-II
Reinforces technical skills in fundamental radiographic procedures. Introduces more intricate contrast media procedures. Focuses on technical proficiency, application of radiation, protection, nursing skills, and exposure principles. Teaches advanced technical procedures and principles of imaging modalities, correlating previous radiographic theory, focusing on full responsibility for patients in technical areas, perfecting technical skills, and developing awareness of related areas utilizing ionizing radiation. Provides clinical experience in cooperating health agencies. Prerequisite: Admission into program. Clinical 25 hours per week.
→ RAD 233  |  1 credit  
Anatomy and Positioning of the Breast  
Presents the risk factors for breast disease, anatomy and physiology of the breast and discusses the various pathologies identified through mammography. Includes routine and special projections of the breast. Prerequisite: Divisional approval: ARRT or eligible. Lecture 1 hour per week.

→ RAD 234  |  1 credit  
Breast Imaging/Instrumentation  
Discusses the dedicated radiography equipment necessary for breast imaging. Includes proper technical factors, radiation protection techniques, and proper accessory equipment. Prerequisite: Divisional approval: ARRT or eligible. Lecture 1 hour per week.

→ RAD 235  |  1 credit  
Quality Assurance in Mammography  
Discusses the components of quality assurance in mammography and the accreditation programs developed to ensure quality in breast imaging facilities. Prerequisite: Divisional approval: ARRT or eligible. Lecture 1 hour per week.

→ RAD 242  |  2 credits  
Computed Tomography Procedures and Instrumentation  
Focuses on the patient care, imaging procedure and physics and instrumentation related to computed tomography imaging. Prerequisite: Divisional approval: ARRT or eligible. Lecture 2 hours per week.

→ RAD 245  |  1 credit  
Radiologic Specialties  
Introduces the study of treatment of disease as it relates to various imaging modalities, computerized tomography, and magnetic resonance imaging. Introduces computers and other innovations in radiology. Emphasizes theory, principle of operation and clinical application of these topics. Prerequisite: Admission into program. Lecture 1 hour per week.

→ RAD 247  |  3 credits  
Cross-Sectional Anatomy  
Presents a specialized study of cross-sectional anatomy relevant to sectional imaging modalities such as computed tomography and magnetic resonance imaging. Prerequisite: Divisional approval: ARRT or eligible. Lecture 3 hours per week.

→ RAD 255  |  3 credits  
Radiographic Equipment  
Studies principles and operation of general and specialized X-ray equipment. Prerequisite: Admission into program. Lecture 3 hours per week.

→ RAD 280  |  1 credit  
Terminal Competencies in Radiography  
Includes preparation and ensures that students possess competencies which relate to materials covered by the ARRT Content Specifications for national exam eligibility. Incorporates activities designed to verify that students have mastered skills in the critical content areas to include equipment operation and maintenance, image production and evaluation, radiographic procedures, radiation protection and patient care. Prerequisite: Admission into program. Laboratory 3 hours per week.

REAL ESTATE

→ REA 100  |  4 credits  
Principles of Real Estate  
Examines practical applications of real estate principles. Includes a study of titles, estates, land descriptions, contracts, legal instruments and concepts, real estate mathematics, financing, agency, appraisal, fair housing, and management of real estate. Lecture 4 hours per week.

RELIGION

→ REL 200  |  3 credits  
Survey of the Old Testament  
Surveys books of the Old Testament, with emphasis on prophetic historical books. Examines the historical and geographical setting and place of the Israelites in the ancient Middle East as background to the writings. Lecture 3 hours per week.
→ REL 210 | 3 credits  
Survey of the New Testament  
Surveys books of the New Testament, with special attention upon placing the writings within their historical and geographical setting. **Lecture 3 hours per week.**

→ REL 215 | 3 credits  
New Testament and Early Christianity  
Surveys the history, literature, and theology of early Christianity in the light of the New Testament. **Lecture 3 hours per week.**

→ REL 216 | 3 credits  
Life and Teachings of Jesus  
Studies the major themes in the teachings of Jesus of Nazareth as recorded in the Gospels, and examines the events of his life in light of modern biblical and historical scholarship. **Lecture 3 hours per week.**

→ REL 217 | 3 credits  
Life and Letters of Paul  
Studies the journeys and religious thought of the apostle Paul. **Lecture 3 hours per week.**

→ REL 230 | 3 credits  
Religions of the World  
Introduces the religions of the world with attention to origin, history, and doctrine. **Lecture 3 hours per week.**

→ REL 255 | 3 credits  
Selected Problems and Issues in Religion  
Examines selected problems and issues of current interest in religion. May be repeated for credit. **Lecture 3 hours per week.**

→ RTH 102 | 3 credits  
Integrated Sciences for Respiratory Care II  
Integrates the concepts of mathematics, chemistry, physics, microbiology, and computer technology as these sciences apply to the practice of respiratory care. **Prerequisite: Admission into program or instructor permission. Lecture 3 hours per week.**

→ RTH 120 | 2 credits  
Fundamental Theory for Respiratory Care  
Presents the theory of basic patient assessment and functional medical terminology. **Prerequisite: Admission into program or instructor permission. Lecture 2 hours per week.**

→ RTH 121 | 3 credits  
Cardiopulmonary Science I  
Focuses on pathophysiology, assessment, treatment, and evaluation of patients with cardiopulmonary disease. Explores cardiopulmonary and neuromuscular physiology and patho-physiology. **Prerequisite: Admission into program or instructor permission. Lecture 3 hours per week.**

→ RTH 131-132 | 4 credits each  
Respiratory Care Theory and Procedures I-II  
Presents theory of equipment and procedures and related concepts used for patients requiring general, acute, and critical cardiopulmonary care. **Prerequisite: Admission into program or instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.**

→ RTH 145 | 1 credit  
Pharmacology for Respiratory Care I  
Presents selection criteria for the use of and detailed information on pharmacologic agents used in pulmonary care. **Prerequisite: Admission into program or instructor permission. Lecture 1 hour per week.**

→ RTH 217 | 2 credits  
Pulmonary Rehabilitation, Home Care and Health Promotion  
Focuses on purpose and implementation of a comprehensive pulmonary rehabilitation program. Explores procedures and approaches used in pulmonary home care. Identifies and discusses major health and wellness programs applied to cardiopulmonary patients. **Prerequisite: Admission into program or instructor permission. Lecture 2 hours per week.**

→ RTH 222 | 3 credits  
Cardiopulmonary Science II  
Focuses on assessment, treatment, and evaluation of patients with cardiopulmonary disease. Explores cardiopulmonary, renal and neuromuscular physiology, and pathophysiology. **Prerequisite: Admission into program or instructor permission. Lecture 3 hours per week.**
→ RTH 223  |  2 credits  
Cardiopulmonary Science III  
Continues the exploration of topics discussed in RTH 121 and 222. **Prerequisite:** Admission into program or instructor permission. Lecture 2 hours per week.

→ RTH 225  |  3 credits  
Neonatal and Pediatric Respiratory Procedures  
Focuses on the cardiopulmonary physiology, pathology and application of therapeutic procedures in the management of the newborn and pediatric patient. **Prerequisite:** Admission into program or instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ RTH 235  |  3 credits  
Diagnostic and Therapeutic Procedures II  
Presents the use of multiple diagnostic and therapeutic techniques used in ambulatory and critical care patients. **Prerequisite:** Admission into program or instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ RTH 236  |  3 credits  
Critical Care Monitoring  
Focuses on techniques and theory necessary for the evaluation and treatment of the critical care patient, especially arterial blood gases and hemodynamic measurements. Explores physiologic effects of advanced mechanical ventilation. **Prerequisite:** Admission into program or instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ RUS 101-102  |  4 credits each  
Beginning Russian I-II  
Develops the understanding, speaking, reading, and writing of Russian, and emphasizes the structure of the language. May include oral drill and practice. **Prerequisite for RUS 102:** RUS 101 or 2 years of high school Russian. Lecture 4 hours per week. May include one additional hour of oral practice per week.

→ RUS 201-202  |  3 credits each  
Intermediate Russian I-II  
Continues the development of the skills of understanding, speaking, reading, and writing of Russian. Class conducted in Russian. **Prerequisite for RUS 201:** RUS 102 or 3 years of high school Russian. **Prerequisite for RUS 202:** RUS 201 or 4 years of high school Russian. Lecture 3 hours per week.

→ SAF 120  |  3 credits  
Safety and Health Standards: Regulations and Codes  
Teaches development of safety standards, the Occupational Safety and Health Act (OSHA), its rules and regulations; penalties for non-compliance, and methods of compliance. Includes an examination of Government Regulatory Codes and appraisal of consensus, advisory, and proprietary standards. Lecture 3 hours per week.

→ SAF 126  |  3 credits  
Principles of Industrial Safety  
Teaches principles and practices of accident prevention, analysis of accident causes, mechanical safeguards, fire prevention, housekeeping, occupational diseases, first aid, safety organization, protection equipment and general safety principles and promotion. Lecture 3 hours per week.

→ SAF 127  |  2 credits  
Industrial Safety  
Provides basic understanding of safety and health in an industrial situation. Includes hazardous materials, substances, conditions, activities and habits as well as the prescribed methods and equipment needed for the apprentice to protect himself/herself and others. Lecture 2 hours per week.

→ SAF 130  |  1 credit  
Industrial Safety - OSHA 10  
Presents an introduction to occupational health and safety and its application in the workplace. Emphasizes safety standards and the Occupational Safety and Health Act (OSHA), its rules and regulations (OSHA 10). Lecture 1 hour per week.
SAF 135 | 3 credits
Safety Program Organization and Administration
Introduces techniques of organizing and administering practical safety programs. Emphasizes safety as a management function. Includes an examination of history, occupational safety and health regulations, and a survey of current laws, codes and standards. Lecture 3 hours per week.

SAF 205 | 3 credits
Human Factors and Safety Psychology
Studies stresses on the human system, both physiological and psychological, that contribute to the severity of industrial accidents. Includes the interrelationship of industrial medicine and industrial hygiene and a study of the various occupational illnesses. Lecture 3 hours per week.

SAF 246 | 3 credits
Hazardous Chemicals, Materials, and Waste in the Workplace
Introduces the rules and regulations governing use, exposure to, and disposal of hazardous chemicals, materials and waste by-products. Discusses OSHA “Right to Know Laws,” EPA and RCRA regulations. Provides the techniques to interpret and understand the code of Federal Regulations. Emphasizes management mandates, strategies, and options to comply with these regulations. Lecture 3 hours per week.

SOC 200 | 3 credits
Principles of Sociology
Introduces fundamentals of social life. Presents significant research and theory in areas such as culture, social structure, socialization, deviance, social stratification, and social institutions. Lecture 3 hours per week.

SOC 201-202 | 3 credits each
Introduction to Sociology I-II
Introduces basic concepts and methods of sociology. Presents significant research and theory in areas such as socialization, group dynamics, gender roles, minority group relations, stratification, deviance, culture, and community studies. Includes population, social change, and social institutions (family, education, religion, political system, economic system). Lecture 3 hours per week.

SOC 211 | 3 credits
Principles of Anthropology I
Inquires into the origins, development, and diversification of human biology and human cultures. Includes fossil records, physical origins of human development, human population genetics, linguistics, cultures’ origins and variation, and historical and contemporary analysis of human societies. Lecture 3 hours per week.

SOC 215 | 3 credits
Sociology of the Family
Studies topics such as marriage and family in social and cultural context. Addresses the singles scene, dating and marriage styles, child-rearing, husband and wife interaction, single parent families, and alternative lifestyles. Lecture 3 hours per week.

SOC 225 | 3 credits
Sociology of Gender
Analyzes influence of major social institutions and socialization in shaping and changing sex roles in contemporary society. Examines differential access to positions of public power and authority for men and women. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.
→ **SOC 246 | 3 credits**  
**Death and Society**  
Analyzes death and its relationship to social behavior and social institutions. Focuses attention on types of death, bereavement, funerals, estate planning/inheritance, and the student's own responses to these issues. **Lecture 3 hours per week.**

→ **SOC 266 | 3 credits**  
**Race and Ethnicity**  
Considers race and ethnicity as social constructs that deeply affect our personal experience and our social institutions. Examines the relationships of racial and ethnic groups with each other and with the larger society, and the ways in which these relationships are constantly changing. Explores the experience of different groups and examines ideas of racial justice and equality. Introduces significant theoretical approaches to the study of race and ethnicity. **Prerequisite:** Placement into ENG 111. **Lecture 3 hours per week.**

→ **SOC 268 | 3 credits**  
**Social Problems**  
Applies sociological concepts and methods to analysis of current social problems. Includes delinquency and crime, mental illness, drug addiction, alcoholism, sexual behavior, population crisis, race relations, family and community disorganization, poverty, automation, wars, and disarmament. **Lecture 3 hours per week.**

→ **SPA 163 | 3 credits**  
**Spanish for Health Professionals I**  
Introduces Spanish to those in the health sciences. Emphasizes oral communication and practical medical vocabulary. May include oral drill and practice. **Lecture 3 hours per week.**

→ **SPA 203-204 | 3 credits each**  
**Intermediate Spanish I-II**  
Continues to develop understanding, speaking, reading, and writing skills. Classes conducted in Spanish. **Prerequisite for SPA 203:** SPA 102 or 3 years of high school Spanish. **Prerequisite for SPA 204:** SPA 203 or 4 years of high school Spanish. **May include oral drill and practice. Lecture 3 hours per week.**

→ **SDV 100 | 1 credit**  
**College Success Skills**  
Assists students in transition to college. Provides overviews of college policies, procedures, and curricular offerings. Encourages contacts with other students and staff. Assists students toward college success through information regarding effective study habits, career and academic planning, and other college resources available to students. May include English and Math placement testing. **Strongly recommended for beginning students. Required for graduation. Lecture 1 hour per week.**

→ **SDV 101 | 1 credit**  
**Orientation to (Specific Disciplines)**  
Introduces students to the skills which are necessary to achieve their academic goals, to the services offered at the college, and to the discipline in which they are enrolled. Covers topics such as services offered at the college, including the learning resources center; counseling and advising; listening, test taking, and study skills; and topical areas which are applicable to their particular discipline. **Lecture 1 hour per week.**
### SDV 106 | 1 credit
**Preparation for Employment**

Provides experience in resume writing, preparation of applications, letters of application, and successfully preparing for and completing the job interview. Assists students in identifying their marketable skills and aptitudes. Develops strategies for successful employment search. Assists students in understanding effective human relations techniques and communication skills in job search. **Lecture 1 hour per week.**

### SDV 108 | 3 credits
**College Survival Skills**

Provides an orientation to the college. Introduces study skills, career and life planning. Offers an opportunity to engage in activities aimed at self-discovery. Emphasizes development of “coping skills” such as listening, interpersonal relations, competence, and improved self-concept. Recommended for students enrolled in developmental courses. **Lecture 3 hours per week.**

### TRUCKING

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRK 101</td>
<td>2</td>
<td>DOT Safety Rules and Regulations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes an intensive study of the Department of Transportation and state and local laws and regulations governing the motor carrier industry as applied to the professional operation of commercial vehicles. <strong>Lecture 2 hours per week.</strong></td>
</tr>
<tr>
<td>TRK 102</td>
<td>1</td>
<td>Preventive Maintenance for Truck Drivers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focuses on the fundamentals of preventive maintenance and inspection procedures for gasoline and diesel powered tractor trailers. Includes drivelines, brake systems, electrical system and accessories encountered by the professional truck driver. <strong>Lecture 1 hour per week.</strong></td>
</tr>
<tr>
<td>TRK 103</td>
<td>9</td>
<td>Tractor Trailer Driving</td>
</tr>
<tr>
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<td></td>
<td>Prepares the prospective driver to operate a motor vehicle in a safe and responsible manner. Provides practical training in over-the-road and city driving, including backing skills, and pre-trip inspection. Emphasizes defensive driving. <strong>Lecture 3 hours. Laboratory 12 hours. Total 15 hours per week.</strong></td>
</tr>
</tbody>
</table>

### TRK 110 | 3 credits
**Survey of the Trucking Industry**

Provides an overview of the trucking industry and the characteristics of the professional truck driver. Emphasizes the uses of technology in the trucking industry, including simulators, mobile information management and communication, and electronic mapping techniques. Provides an introduction to the transportation of hazardous materials and environmental issues. **Lecture 3 hours per week.**

### VETERINARY ASSISTANT

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>VET 100</td>
<td>4</td>
<td>Introduction to Animal Science</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surveys the common breeds of small and large domestic animals, including identification, management, and restraint. <strong>Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.</strong></td>
</tr>
<tr>
<td>VET 101</td>
<td>3</td>
<td>Introduction to Veterinary Assisting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presents basic information about assisting the veterinarian. Includes information about companion animals, primarily dogs and cats. <strong>Lecture 3 hours per week.</strong></td>
</tr>
<tr>
<td>VET 102</td>
<td>3</td>
<td>Care and Maintenance of Small Domestic Animals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presents basic information about general and veterinary management of small domestic animals, especially dogs and cats. Provides information concerning animal and human safety, animal restraint, nutrition, common diseases, medical terminology, medical history, and other topics related to the care and maintenance of small animals. <strong>Lecture 3 hours per week.</strong></td>
</tr>
<tr>
<td>VET 103</td>
<td>3</td>
<td>Veterinary Office Assisting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presents basic information about common business procedures used in veterinary practice. Includes client and staff relationships and veterinary regulations. <strong>Lecture 3 hours per week.</strong></td>
</tr>
</tbody>
</table>
WELDING

→ WEL 100  |  3 credits
Fundamentals of Welding
Introduces arc and oxyfuel welding and cutting. Provides fundamental principles of joining ferrous and non-ferrous metals, welding and cutting processes, equipment operation, and safety procedures with emphasis upon welding and cutting procedures. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ WEL 117  |  3 credits
Oxyfuel Welding and Cutting
Introduces history of oxyacetylene welding, principles of welding and cutting, nomenclature of the equipment, development of the puddle, running flat beads, and butt welding in different positions. Explains silver brazing, silver and soft soldering, and safety procedures in the use of tools and equipment. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ WEL 123  |  3 credits
Shielded Metal Arc Welding (Basic)
Teaches operation of AC and DC power sources, welding polarities, heats and electrodes for use in joining various metal alloys by the arc welding process. Deals with running beads, butt, and fillet welds in all positions. Emphasizes safety procedures. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ WEL 124  |  3 credits
Shielded Metal Arc Welding (Advanced)
Continues instruction on operation of AC and DC power sources, welding polarities, heats and electrodes for use in joining various metal alloys by the arc welding process. Deals with running beads, butt, and fillet welds in all positions. Emphasizes safety procedures. Prerequisite: WEL 123. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ WEL 126  |  3 credits
Pipe Welding I
Teaches metal arc welding processes including the welding of pressure piping in the horizontal, vertical, and horizontal-fixed positions in accordance with section IX of the ASME Code. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ WEL 130  |  3 credits
Inert Gas Welding
Introduces practical operations in the uses of inert-gas-shielded arc welding. Discusses equipment, safety operations, welding practice in the various positions, process applications, and manual and semi-automatic welding. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ WEL 135  |  2 credits
Inert Gas Welding
Introduces practical operations in the use of inert gas shielded arc welding. Studies equipment operation, setup, safety and practice of GMAW (MIG) and GTAW (TIG). Prerequisite: WEL 124. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ WEL 136  |  2 credits
Welding III (Inert Gas)
Studies Tungsten and metallic inert gas procedures and practices including principles of operation, shielding gases, filler rods, process variations and applications, manual and automatic welding, equipment and safety. Prerequisite: WEL 117. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ WEL 138  |  2 credits
Pipe and Tube Welding
Develops entry level skills for the inert gas tungsten welding process (TIG) with emphasis upon thin and thick wall carbon and stainless piping and tubing. Prerequisite: WEL 136. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

→ WEL 141-142  |  3 credits each
Welder Qualification Test I-II
Studies techniques and practices of testing welded joints through destructive and non-destructive testing. Prerequisite for WEL 142: WEL 141. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

→ WEL 150  |  2 credits
Welding Drawing and Interpretation
Teaches fundamentals required for successful drafting as applied to the welding industry. Includes blueprint reading, geometric principles of drafting and freehand sketching, basic principles of orthographic projection, preparation of drawings and interpretation of symbols. Lecture 2 hours per week.
→ **WEL 165 | 2 credits**  
**Introduction to Maritime Welding**  
Teaches general welding terms, symbols, and joint designs used by maritime industries. Develops skills to recognize weld defects, develops familiarization of drawings and workmanship specifications used for welding applications in the maritime industry, and certifies the student as a Maritime Industrial Fire Watch. *Lecture 2 hours per week.*

→ **WEL 170 | 3 credits**  
**Maritime Shielded Metal Arc Fillet Welding (SMAW I)**  
Provides an introduction to Maritime Shielded Metal Arc Fillet Welding (SMAW). Focuses on equipment setup, adjustment and maintenance, safety, and electrode selection. Includes preparation of labs to develop welding skills on carbon steels using small and large diameter covered electrodes in all positions on fillet welds. Provides an introduction to specific types of electrodes and base materials used in SMAW I welding. *Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.*

→ **WEL 171 | 3 credits**  
**Maritime Shielded Metal Arc Groove Welding (SMAW II)**  
Provides an introduction to Maritime Shielded Metal Arc Groove Welding and covers equipment setup, adjustment and maintenance, safety, and electrode selection. Includes preparation of labs to develop welding skills on carbon steels using small and large diameter covered electrodes in all positions on groove welds. Provides an introduction to specific types of electrodes and base materials used in SMAW II welding. *Prerequisite: WEL 170. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.*

→ **WEL 171 | 3 credits**  
**Maritime Gas Metal Arc Fillet Welding (GMAW)**  
Provides an introduction to Maritime Gas Metal Arc Fillet Welding and covers equipment setup, adjustment and maintenance, safety, electrode selection, training to develop welding skills on carbon steels using small and large diameter bare wire electrodes in all positions on fillet welds. Provides an introduction to specific types of electrodes and base materials used in GMAW welding. *Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.*

→ **WEL 230 | 2 credits**  
**Maritime Gas Tungsten Arc Fillet Welding (GTAW)**  
Provides an introduction to Maritime Gas Tungsten Arc Fillet Welding and covers equipment setup, adjustment and maintenance, safety, electrode selection, training to develop welding skills on carbon steels using small and large diameter bare wire electrodes in all positions on fillet welds. Provides an introduction to specific types of electrodes and base materials used in GTAW welding. *Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.*

→ **WEL 220 | 3 credits**  
**Maritime Flux Core Arc Fillet Welding (FCAW)**  
Provides an introduction to Maritime Flux Core Arc Fillet Welding and covers equipment setup, adjustment and maintenance, safety, electrode selection, training to develop welding skills on carbon steels using small and large diameter flux-cored electrodes in all positions on fillet and groove welds. Provides an introduction to specific types of electrodes and base materials used in FCAW welding. *Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.*
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M.S.Ed., Virginia Polytechnic Institute and State University
Ph.D., Old Dominion University

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M.S., Longwood University
Ed.S., Old Dominion University

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M.P.A., Troy State University

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Coordinator—eHealth Program
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M.S., Old Dominion University

Christine Damrose-Mahlmann
College Registrar
A.A., Tidewater Community College
B.A., Christopher Newport University
M.S.Ed., Old Dominion University

Teresa A. Dees
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M.A., Norfolk State University
Ph.D., George Washington University

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M.S., Old Dominion University
M.A., Old Dominion University

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M.A., Central Michigan University
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Lauren A. Escobales
International Student Advisor—Principal Designated School Official
B.A., University of Illinois
M.Ed., University of Oklahoma

Jennifer J. Ferguson
Director of Assessment and Transfer Partnerships
A.A.S., Tidewater Community College
B.A., Ottawa University
M.S.Ed., Old Dominion University

Elizabeth C. Foushee
Grants Officer/Writer
B.M.Ed., Ohio State University
M.P.A., Old Dominion University

Batanya Monique Gipson
Project Coordinator—Military Contract Programs
B.A., Georgetown University
M.Ed., Pennsylvania State University

Amanda G. Goldstein
Instructional Designer
B.S., James Madison University
M.S.Ed., James Madison University

Ronald A. Gray
Coordinator—Student Leadership Development & Community Engagement
B.S., Pennsylvania State University
M.S., State University of New York at Buffalo

David R. Guglielmo
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A.A.B., Zane State College  
B.B.A., Mount Vernon Nazarene University  
M.B.A., University of Findlay

Cassandra A. Harris  
*Base Representative—Portsmouth Naval Medical Center*  
B.A., Saint Leo University  
M.A., Norfolk State University

Susan M. James  
*Special Assistant to the President/Chief of Staff*  
A.A.S., Tidewater Community College  
B.A., Saint Leo University  
M.P.A., Troy State University

Marsha M. Jurewicz  
*Coordinator—eLearning Design & Development*  
B.S., Mississippi State University  
M.Ed., Mississippi State University  
Ed.D., College of William and Mary

Heather C. Kitsis  
*Coordinator—Job Placement*  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.S.Ed., Old Dominion University

Paul H. Lasakow  
*Executive Director—Roper Performing Arts Center*  
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B.A., Old Dominion University  
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*Associate Director—Institutional Effectiveness*  
A.S., Tidewater Community College  
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*Grants Coordinator*  
B.A., James Madison University  
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Charles E. McGee  
*Director—Network Services and Support*  
B.S., Excelsior College  
Certificate of CompTIA

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*Project Director—DOLTAA Grant*  
B.S., Old Dominion University  
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Program Coordinator—Academy for Nonprofit Excellence  
B.A., University of Wisconsin  
M.S., University of Wisconsin  

R. Lyn Rainard  
Faculty Liaison—eLearning  
A.S., Edison Junior College  
B.A., University of South Florida  
M.A., University of South Florida  
Ph.D., Louisiana State University  

Alexandra C. Rice  
Development Officer  
B.A., Virginia Polytechnic Institute and State University  
M.A., Old Dominion University  

Randall Brent Rice, Sr.  
Director—Military Academic Programs  
B.S., Old Dominion University  
M.S., Old Dominion University  

Calvin R. Scheidt, Jr.  
Director—Military Contract Programs  
B.S., University of La Verne  
M.B.A., National University  
M.P.A., Troy State University  

Jessica R. Smith  
Director—Student Mental Health & Behavior and Staff Psychologist  
B.S., Old Dominion University  
M.A., Regent University  
Psy.D., Regent University  

Lawrence D. Smith  
Associate Professor—Counselor  
B.S., James Madison University  
M.Ed., College of William and Mary  
Ed.D., Regent University  

Peter F. Sommer  
Director—Emergency Preparedness  
A.S., Northeastern University  
B.S., Madonna University  
M.P.A., Old Dominion University  

Kellie C. Sorey  
Associate Vice President—Academics  
B.S., Virginia Polytechnic Institute and State University  
M.A.Ed., Virginia Polytechnic Institute and State University  
Ph.D., Old Dominion University  

Laura R. Soulsby  
Associate Director—Center for Intercultural Learning  
B.A., Longwood University  
M.A. Old Dominion University  

Frederick E. Stemple, Jr.  
Associate Vice President—Faculty Professional Development  
B.S., Old Dominion University  
M.S., Old Dominion University  

James P. Toscano  
Vice President—Public Affairs & Communications  
B.S., Old Dominion University  
M.Sc., University of London  

Iris H. Wang  
Coordinator—Learning Management and System Services  
B.S., Dalian University  
M.S., Dalian University  
M.S., Concordia University  

Kay M. Williams  
Director—Student Support Services Project  
B.A., Hampton University  
M.S., Stevens Institute of Technology  

Robin L. P. Ying  
Vice President—Information Systems  
B.S., National Taiwan University  
M.S., Yale University  
Ph.D., University of California at Berkeley
Virginia K. Zillges  
*Dean—eLearning*  
B.A., University of Wisconsin  
M.A., Regent University  

Jeanetta Hollins  
*Coordinator—Financial Support Services*  
B.S., Indiana University of Pennsylvania  
M.Ed., University of Pittsburg  

Constance V. King  
*Business Manager*  
B.S., Ramapo College  
M.B.A., Rutgers University  

Kevin McCarthy  
*First-Year Success Coordinator*  
B.S., Old Dominion University  
M.S.Ed., Old Dominion University  

James E. Perkinson, Jr.  
*Dean—Business, Public Services, and Technologies*  
B.S., East Carolina University  
M.S.Ed., Old Dominion University  

Beno Rubin  
*Director—Regional Automotive Center*  
A.A.S., State University of New York at Westchester Community College  
B.S., City University of New York at Lehman College  
M.S., Nova Southeastern University  

Tuenika S. Wynn  
*Adult Career Coach*  
B.S., Wright State University  

CHESAPEAKE CAMPUS

Lisa B. Rhine  
*Provost*  
Certificate, Sinclair Community College  
B.S., Wright State University  
M.S.Ed., University of Dayton  
Ph.D., Capella University  

Abbie J. Basile  
*Coordinator—Library Services*  
B.A., Buffalo State College  
M.L.S., University of Buffalo  

Pamela M. Cornell  
*Job Placement Coordinator*  
B.S., Syracuse University  
M.S., State University of New York at Oneonta  

Stacy Davidson  
*Adult Career Coach*  
B.A., University of Virginia  
M.A., Bowling Green State University  

Jeffery L. Dunbar  
*Student Center Director*  
B.S.B.Ed., West Virginia University  
M.B.A., Eastern Oregon University  

James E. Edwards  
*Dean—Student Services*  
B.S., James Madison University  
M.Ed., James Madison University  
Ed.D., Nova Southeastern University  

Vincent Gary  
*Student Center Associate Director*  
B.S., Old Dominion University  
M.S., Old Dominion University  

Kristen H. Gregory  
*Faculty Professional Development Manager*  
B.A., University of Richmond  
M.Ed., Virginia Commonwealth University  

NORFOLK CAMPUS

Jeffery S. Boyd  
*Provost*  
A.A., San Joaquin Delta College  
B.A., Judson University  
M.A., University of Phoenix  
Ed.D., National Louis University  

Terrence L. Bowers  
*Student Center Associate Director*  
A.A.S., Paul D. Camp Community College  
B.S., Christopher Newport University  
M.A., Norfolk State University
Emanuel Chestnut  
Dean—Student Services  
A.A., Saint Leo University  
B.A., Saint Leo University  
M.A., Norfolk State University

Blair A. Ellis  
Student Center & Student Success Initiatives Director  
B.A., George Mason University  
M.S., Old Dominion University

Sonya R. Fitchett  
Coordinator—Financial Aid Services  
B.S., Old Dominion University  
M.A., Old Dominion University

Reginald L. Osby  
Business Manager  
B.S., Norfolk State University  
M.B.A., Western New England College

Kerry M. Ragno  
Dean—Languages, Mathematics, and Sciences  
B.A., California State University at Chico  
M.A., San Jose State University  
Ed.D., Fielding Graduate University

Robert B. Sulzberger  
Developmental Education Manager  
B.B.A., College of William and Mary  
M.Ed., College of William and Mary  
Ed.S., George Washington University

Anne E. Weiss  
Faculty Professional Development Manager  
B.S., Pennsylvania State University  
M.S., Arizona State University

PORTSMOUTH CAMPUS

Michelle W. Woodhouse  
Provost  
B.S., Virginia Commonwealth University  
M.A., Norfolk State University  
Ed.D., Nova Southeastern University

Ann P. Ambrose  
Dean—Business, Public Services, and Technologies  
B.S., Norfolk State University  
M.S., Virginia Polytechnic Institute and State University

Katina T. Barnes  
Student Center Director  
A.A., Art Institute of Atlanta  
B.S.W., Norfolk State University  
M.A., Norfolk State University

Okema S. Bowers  
Faculty Professional Development Manager  
B.S., Norfolk State University  
M.S., George Washington University  
Ed.D., Regent University

Kimberly A. Curry-Lourenco  
Coordinator—Instruction & Technology, Beazley School of Nursing  
B.S.N., Old Dominion University  
M.S.N., Old Dominion University  
M.Ed., Old Dominion University  
Ph.D., Duquesne University

Phyllis M. Eaton  
Dean—Beazley School of Nursing  
B.S.N., DePaul University  
M.S., Hampton University  
Ph.D., Hampton University

Mary S. Glanzer  
Coordinator—Library Services  
B.S., Longwood University  
M.S.L.S., University of Kentucky

Nicole A. King Harvey  
Developmental Education Manager  
B.A., Bennett College  
M.A., National University

Theresa A. Ruffing  
Coordinator—Financial Support Services  
B.A., University of Kentucky  
M.S., Old Dominion University

Christina M. Rupsch  
Director—Visual Arts Center  
B.S., University of Wisconsin  
M.F.A., Southern Illinois University  
Ed.M., University of Illinois
Dana M. Singleton  
First-Year Success Coordinator  
B.S., Norfolk State University  
M.Ed., Regent University

Jenefer D. Snyder  
Dean—Languages, Mathematics, and Sciences  
B.S., Virginia Polytechnic Institute and State University  
M.S.Ed., Old Dominion University

John H. Thornburg  
Business Manager  
B.S., Old Dominion University  
B.A., Old Dominion University

VIRGINIA BEACH CAMPUS

Michael D. Summers  
Provost  
B.S., University of Illinois  
M.Ed., Western Illinois University  
Ed.D., University of Illinois

Marcanne Andersen  
Dean—Humanities  
B.S., University of Wisconsin  
M.A., Minnesota State University

Michele C.C. Barnes  
Coordinator—Support Services  
A.A., Florida Community College  
B.S., Southern Illinois University  
M.A., Webster University

Thomas G. Calogrides, Jr.  
Dean—Health Professions  
Certificate, Tidewater Community College  
B.S., Old Dominion University  
M.S.Ed., Old Dominion University

David A. Ekker  
Dean—Engineering, Mathematics, and Industrial Technologies  
A.A.E., Naval Postgraduate School  
B.S., University of Illinois  
M.B.A., Chaminade University

Terry M. Eusebio III  
Coordinator—Admissions  
B.S., Old Dominion University  
M.S., Old Dominion University

Joseph J. Fairchild  
Dean—Social Sciences and Public Services  
A.S., Mattatuck Community College  
B.S., Western Connecticut State University  
J.D., University of Bridgeport School of Law

Gregory P. Frank  
Dean—Natural Sciences  
B.S., Virginia Polytechnic Institute and State University  
M.S., Virginia Polytechnic Institute and State University

Sarah E. Greene  
Coordinator—Technology & Library Operations  
B.A., New York University  
M.S.L.S., University of Maryland

Emily R. Hartman  
Co-Director—Student Activities/Operations & Student Leadership  
B.A., Thiel College  
M.B.A., Capella University

Tawana A. Hill  
Coordinator—Financial Services  
B.S., Old Dominion University  
M.P.A., Old Dominion University

Marilyn R. Hodge  
Dean—Student Services  
B.A., Brooklyn College, CUNY  
M.A., New York University  
M.A., Columbia University  
Ed.D. Columbia University

Brittany P. Horn  
Coordinator—Library Academic Services  
B.A., Old Dominion University  
M.S.L.S., University of Maryland

Thomas H. Lee  
Faculty Professional Development Coordinator  
B.S., Old Dominion University  
M.S.Ed., Old Dominion University
Sarah L. Lupton  
Co-Director—Student Activities/Student Engagement & Campus Life  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.P.A., Old Dominion University

Marilyn L. Medley  
Coordinator—Enrollment Services  
B.S., Old Dominion University  
M.S.Ed., Capella University

Lori W. Reimann  
Business Manager  
A.A., Prince George’s Community College  
B.S., University of Maryland

Vickie Whidbee  
Developmental Education Manager  
B.A., Elizabeth City State University  
M.S.A., Elizabeth City State University  
Ed.D., University of Phoenix

PROFESSORS AND CLASSIFIED STAFF EMERITI  
(years of TCC service)

Deborah M. DiCroce  
President  

Roberta L. Bernardini  
Professor of Nursing  
(1980 - 2013)

Richard F. Andersen  
Vice President for Information Systems  
(1996 - 2013)

Joseph E. Browne  
Professor of Biology  

Walter H. Brueggeman, Jr.  
Associate Professor of Automotive Technology  
(1980 – 2011)

William J. Clark III  
Dean of Academics, Norfolk Campus  
(1978 – 2004)

Mary Ruth Clowdsley  
Director of Grants  
(1976 – 2001)

Roberta S. Cool  
Dean of Information Technology & Business, Virginia Beach Campus  
(1989 – 2007)

Allan Crandall  
Associate Professor of History  
(1968 – 2000)

Cheryl W. Creager  
Professor of Business Management & Administration  
(1972 – 2007)

Elizabeth S. Daughtry  
Associate Professor of Chemistry  
(1978 – 2001)

Bill C. DeWeese  
Professor of English  
(1972 – 2008)

Anita Dial  
Education Support Specialist II  

Joanne M. Diddlemeyer  
Professor of English & Reading (Developmental)  
(2000 - 2013)

Nancy S. Duncan  
Director of Human Resources  

Margaret A. Dutton  
Administrative & Office Specialist III  
(1979 – 2013)

William A. Fitton, Jr.  
Professor of Information Systems Technology  
(1974 - 2010)
Roger A. Fuller  
Librarian  
(1973 – 2011)

Nancy S. M. Guarnieri  
Professor of Early Childhood Education  
(1973 – 2006)

Sandra H. Harris  
Associate Professor of English  
(1973 – 2007)

Aubrey E. Hartman  
Associate Professor of Physics  
(1969 - 2014)

Betty K. Hicks  
Administrative & Office Specialist III  
(1999 – 2011)

Etta Louise Hillier  
Professor of Accounting  
(1978 – 2005)

Catherine N. Holloway  
Associate Professor of Information Systems Technology  

Rebecca S. Hubiak  
Associate Professor of Mathematics  
(1972 – 2008)

Barbara J. Hund  
Professor of English/Speech  
(1980 – 1999)

Anne S. Iott  
Director of Visual Arts Center  
(1971 – 2002)

Christine D. Jennings  
Associate Professor of English  

Barbara T. Johnson  
Associate Professor of Sociology  

Janice S. Johnson  
Coordinator of Library Services, Virginia Beach Campus  
(1975 – 2009)

Constance M. Jones  
Associate Professor of History  

Terry L. Jones  
Provost, Portsmouth Campus  
(1971 – 2013)

Gerald L. Kerr  
Professor of Legal Assisting  

Lisa S. Kleiman  
Director of Institutional Effectiveness  
(1980 – 2010)

Helena M. Krohn  
Associate Professor of History  
(1972 - 2014)

A. John Massey  
Director of Facilities Planning & Development  
(1973 – 2012)

Judy B. McMillan  
Dean of Student Services, Chesapeake Campus  
(1994 - 2013)

Christine L. Medlin  
Professor of Dietetics  
(1992 - 2013)

James P. O’Brien  
Professor of Psychology  
(1972 - 2015)

Allan V. Pearce  
Associate Professor of Mathematics  
(1969 – 2010)

Betty J. Perkinson  
Professor of English & Reading (Developmental)  
(1979 - 2014)
Charles S. Pierce, Jr.
Professor of English
(1973 – 2010)

Donna Reiss
Associate Professor of English

Linda M. Rice
Provost, Chesapeake Campus
(1979 - 2013)

Wilma S. Robinson
Professor of Administrative Support Technology
(1973 – 1999)

P. Randall Shannon
Dean of Student Services, Portsmouth Campus
(1974 – 2012)

John L. Skrobiszewski
Dean of Languages, Mathematics & Sciences, Portsmouth Campus
(1969 – 2006)

Monica L. Terry
Administrative & Office Specialist III
(1989 - 2014)

Mary B. Thomas
Librarian
(1980 – 2007)

Albert G. Thompson, Jr.
Director of Workforce Development

Judith A. Tomovik
Information Technology Specialist II
(1980 – 2009)

Richard E. Witte
Professor of Reading
(1978 – 2004)

Frederick H. Zeisberg
Dean of Student Services, Virginia Beach Campus

TEACHING AND PROFESSIONAL FACULTY

The locations of principal assignment are indicated as follows: Chesapeake Campus (C), Chesapeake Campus—Regional Automotive Center (C-RAC), Norfolk Campus (N), Portsmouth Campus (P), Portsmouth Campus—Visual Arts Center (P-VAC), and Virginia Beach Campus (V).

Peter T. Agbakpe
Professor—Mathematics (P)
B.S., University of Sciences & Technology
Kumasi, Ghana
M.S., Hampton University
Ph.D., Hampton University

Rick G. Alley
Instructor—English (C)
B.A., Old Dominion University
M.F.A., University of Massachusetts

Jimmie Jane Amelon
Associate Professor—English (N)
B.S., University of Missouri
M.A., Old Dominion University
Ph.D., Old Dominion University

Rianna L. Amolsch
Instructor—English (C)
B.A., Oakland University
M.A., Wayne State University

Hye Chin An
Instructor—Reference Librarian (C)
B.A., University of Memphis
M.S., University of Memphis
M.S., Florida State University

Kathy S. Anderson
Associate Professor—Accounting (N)
B.S., Old Dominion University
M.B.A., College of William and Mary

Cassandra L. Andrews
Associate Professor—Early Childhood Education (N)
B.S., Hampton University
M.A., Hampton University
Joseph C. Antinarella  
Assistant Professor—English (C)  
B.A., State University of New York at Cortland  
M.A., State University of New York at Stony Brook  

Abraham Pena Arispe  
Associate Professor—Diesel/Marine Technology (C - RAC)  
Diploma, Defense Equal Opportunity  
A.A.S., ECPI College of Technology  
B.S., University of Phoenix  
M.Ed., Liberty University  

Julia S. Arnold  
Professor—Mathematics (N)  
B.A., University of South Florida  
M.A., University of Georgia  
M.S., Old Dominion University  
Ph.D., Old Dominion University  

Donald V. Averso  
Assistant Professor—Culinary Arts (N)  
B.S., Seton Hall University  

Michael W. Bales  
Associate Professor—History (N)  
B.A., Salisbury University  
M.A., Salisbury University  

Colleen A. Banks  
Assistant Professor—Mathematics (N)  
B.S., St. Augustine College  
M.S., Old Dominion University  

Travis C. Baran  
Instructor—English (P)  
A.A., State University of New York at Cayuga Community College  
B.A., State University of New York at Oswego  
M.A., State University of New York at Oswego  

Regina I. Barnett  
Instructor—English (V)  
B.S., West Virginia University  
M.Ed., Valdosta State University  

Melanie C. Basinger  
Associate Professor—Physical Therapy (V)  
B.S., Ithaca College  
M.S., Old Dominion University  

Bernice Baxter  
Instructor—Certified Nurse Aide (V)  
L.P.N., Virginia Beach School of Practical Nursing  
A.A.S., Tidewater Community College  

Adam E. Becker  
Assistant Professor—Mathematics (P)  
B.A., Appalachian State University  
M.A., Appalachian State University  
M.S., Florida State University  

Rodney C. Beckner  
Instructor—Mathematics (P)  
B.S., Old Dominion University  
M.S., Old Dominion University  

Lisa L. Behm  
Instructor—Biology (C)  
B.S., State University of New York College of Environmental Science and Forestry  
M.S., Old Dominion University  

Angela Renae Bell  
Associate Professor—Medical Laboratory Technology (V)  
B.S., Christopher Newport University  
M.S., Troy State University  

Debra K. Benham  
Professor—Information Systems Technology (V)  
B.S., Ball State University  
M.A.Ed., Ball State University  

James E. Benson  
Associate Professor—Speech (P)  
B.A., Vanguard University of Southern California  
M.A., Regent University  

Enoch A. Bentley III  
Assistant Professor—Mathematics (V)  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.S., Old Dominion University  

Stephen P. Bergfield  
Associate Professor—Environmental Protection (P)  
A.A.S., Tidewater Community College  
B.S., Old Dominion University
Kristina Bezanson
Assistant Professor—Horticulture (C)
B.F.A., Massachusetts College of Art
M.S., Virginia Polytechnic Institute and State University

Denise M. Bieszczad
Professor—Respiratory Therapy (V)
B.S., Indiana University of Pennsylvania
M.A., George Washington University

Cynthia M. Bird
Associate Professor—Accounting (V)
B.S., Virginia Polytechnic Institute and State University
M.A., Virginia Polytechnic Institute and State University

Michael T. Blankenship
Associate Professor—English (C)
B.A., Virginia Wesleyan College

Amy B. Bohrer
Assistant Professor—Accounting (V)
B.S., Old Dominion University
M.S., Strayer University

Susan D. Boland
Associate Professor—English as a Second Language (V)
B.A., New School
M.A., George Mason University
M.F.A., Old Dominion University

Dwight Bolling
Associate Professor—Sociology (V)
B.S., Florida State University
M.S., Florida State University

Ian M. Bolling
Professor—Sociology (C)
B.A., Virginia Wesleyan College
M.S., Florida State University
J.D., College of William and Mary

Heather C. Boone
Associate Professor—Arts (VAC)
A.F.A., Tidewater Community College
M.F.A., Virginia Commonwealth University

Rita T. Bouchard
Associate Professor—Nursing (P)
B.S., Mount St. Mary's College
M.S.N., University of California at Los Angeles

Kevin M. Brady
Associate Professor—History (C)
B.S.E., Baylor University
M.A., Baylor University
Ph.D., Texas Christian University

Patrick F. Brady
Assistant Professor—Spanish (V)
A.B., University of Missouri
M.A., University of Missouri

David L. Brandt
Instructor—Mathematics (C)
B.S., Virginia Polytechnic Institute and State University
M.S., Old Dominion University

Diana W. Branton
Instructor—Mathematics (V)
A.S., Tidewater Community College
B.S., Old Dominion University
M.S., Texas A & M University

Lynnette F. Brash
Instructor—English (P)
B.A., James Madison University
M.A., University College Dublin

Robin C. Brevard
Instructor—Certified Nurse Aide (V)
A.A.S., Tidewater Community College
B.S.N., Troy University

Elizabeth A. Briggs
Instructor—Speech (C)
B.S., Liberty University
M.S., Liberty University

B. K. Brinkley
Associate Professor—Mathematics (N)
B.S., Virginia Polytechnic Institute and State University
M.S., Virginia Polytechnic Institute and State University

Kenneth O. Broun, Jr.
Associate Professor—Mathematics (V)
B.S., Old Dominion University
M.S., Old Dominion University
Robyn S. Browder  
Associate Professor—English (V)  
B.A., Frederick College  
M.S.Ed., Old Dominion University

Katherine D. Buhrer  
Assistant Professor—Biology (V)  
B.S., Old Dominion University  
M.S., Old Dominion University

Wendy D. Buie  
Associate Professor—Counselor (V)  
B.A., University of North Carolina at Asheville  
M.S., North Carolina A&T State University

Amie H. Burns  
Instructor—Culinary Arts (N)  
A.S., Johnson & Wales University  
B.S., Radford University

Maureen A. Cahill  
Professor—Reading (V)  
B.S., Norfolk State University  
M.S., Old Dominion University  
Ed.D., Nova Southeastern University

Carlos H. Cajares  
Associate Professor—Emergency Medical Services (V)  
Certificate, Tidewater Community College  
B.S., Hampton University  
M.P.A., Old Dominion University

April M. Campbell  
Instructor—English (P)  
B.A., Florida State University  
M.A., Florida State University

Carla A. Cannon  
Associate Professor—Biology (N)  
B.S., Tennessee State University  
M.A., Hampton University

Scott N. Carlson  
Associate Professor—Accounting (C)  
B.S., Loyola Marymount University  
M.S., Golden Gate University  
CPA License

Lisa D. Carter  
Professor—Information Systems Technology (V)  
B.S., Old Dominion University  
M.B.A., Old Dominion University

Christopher W. Cartwright  
Associate Professor—Civil Engineering (V)  
A.S., Tidewater Community College  
B.S., Virginia Polytechnic Institute and State University  
M.S., University of Arkansas

Margaret L. Charlton  
Assistant Professor—Early Childhood Education (V)  
B.S., James Madison University  
M.S.Ed., Old Dominion University

Thomas E. Chatman  
Assistant Professor—Counselor (N)  
B.S., Elizabeth City State University  
M.A., University of Minnesota

Gabriela J. Christie Toletti  
Professor—Spanish (P)  
B.S., University of Uruguay  
E.S.L., Alianza Cultural, Uruguay  
M.A., State University of New York at Buffalo  
Ph.D., State University of New York at Buffalo

Rodney L. Clayton  
Associate Professor—Geophysical Sciences (V)  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.S., Old Dominion University

William Clement  
Professor—Information Systems Technology (V)  
B.S., State University of New York at Oswego  
M.S.Ed., Old Dominion University

Casey L. Clements  
Assistant Professor—Chemistry (V)  
B.S., Grove City College  
M.S., University of Pittsburgh

James F. Coble  
Professor—Geophysical Sciences (V)  
B.S., Western Carolina University  
M.S., East Carolina University  
Ph.D., University of Kentucky
Steven A. Coco  
Instructor—Emergency Medical Services (V)  
A.A., Saint Leo University  
A.A.S., Tidewater Community College

Frederick B. Cole  
Instructor—Automotive Technology (C-RAC)  
A.A.S., Tidewater Community College

William D. Conner  
Assistant Professor—Accounting (P)  
B.S., Christopher Newport University  
M.A., Miami University of Ohio

Alva Judith L. Cook  
Instructor—Radiologic Technology (V)  
A.A.S., Owens Technical College  
B.Ed., University of Toledo

Evelyn Y. Coutee  
Assistant Professor—Nursing (P)  
B.S. Old Dominion University  
M.S.N., Old Dominion University

Forrest B. Crock  
Instructor—Biology (C)  
B.S., Longwood University  
M.S., Old Dominion University

Gary L. Cross  
Assistant Professor—Respiratory Therapy (V)  
A.A.S., Tidewater Community College  
B.S., Old Dominion University

Mittie J. Crouch  
Professor—Speech and Drama (N)  
B.A., Montreat College  
M.A., Regent University  
Ph.D., Regent University

Robert W. Crumpler  
Assistant Professor—Mathematics (V)  
B.S., Old Dominion University  
M.S., Old Dominion University

Pamela M. Dale  
Assistant Professor—Mathematics (C)  
B.S., Elizabeth City State University  
M. Ed., Cambridge College

Susan A. Davis  
Lecturer - Respiratory Therapy (V)  
A.A.S. Tidewater Community College  
B.A., West Virginia Wesleyan College  
M.S., Regent University

Jeffrey A. DeCastillia  
Assistant Professor—Electromechanical Controls Technology (C)  
A.A.S., Tidewater Community College  
B.A., Saint Leo University  
M.A., Regent University

D. Stephan DeLong  
Assistant Professor—Mathematics (V)  
B.S., Northern Illinois University  
M.S., Lehigh University

Mark R. Denison  
Instructor—Music (N)  
B.M., Central Washington University  
M.M., Central Washington University

Stacey E. Deputy  
Instructor—Biology (C)  
B.S., Randolph-Macon Woman’s College  
M.S., Old Dominion University

Jacquelyn A. Dessino  
Associate Professor—Librarian (P)  
B.A., Shippensburg State College  
B.S., Nicholls State University  
M.S.L.S., Louisiana State University  
M.A., Old Dominion University

Sarah E. DiCalogero  
Assistant Professor—Mathematics (N)  
B.S., University of Virginia  
M.S., University of Virginia

Dixie D. Dickinson  
Associate Professor—Sociology (V)  
A.B., Wesleyan College  
M.A., University of Georgia

Richard A. Dienst  
Associate Professor—Fire Science (V)  
A.S., Community College of the Air Force  
A.A., Tidewater Community College  
B.S., Southern Illinois University  
M.P.A., Governors State University
Jennifer Dixon-McKnight
Assistant Professor—History (N)
B.A., University of North Carolina of Chapel Hill
M.A., North Carolina Central University
Ph.D., University of North Carolina of Chapel Hill

Sergei Dolgalev
Professor—Drafting (V)
B.A., Moscow Architectural Institute
Ph.D., Central Research and Design Institute

Susan N. Dozier
Professor—Information System Technology (V)
B.S., Virginia Polytechnic Institute and State University
M.S.Ed., Old Dominion University

Lorenz N. C. Drake
Professor—Drafting (P)
B.S., University of Maryland
M.S.Ed., Virginia Polytechnic Institute and State University
C.A.G.S., Virginia Polytechnic Institute and State University
Certificate Tidewater Community College

Walter Lee Duke, Jr.
Instructor—Welding (P)
Diploma, Roanoke-Chowan Community College

Richard B. Duncan
Associate Professor—Mathematics (P)
A.B., East Carolina University
M.A., East Carolina University

Gillian L. Durham
Instructor—English as a Second Language (V)
B.A., Elon University
M.A., Old Dominion University

Deborah M. Edson
Professor—Spanish (V)
B.A., Texas Tech University
M.A., Texas Tech University

Kimberly S. Edwards
Instructor—English (N)
B.S., Eastern Michigan University
M.A., Eastern Michigan University
Thomas I. Ellis  
Professor—English (N)  
B.A., Ohio Wesleyan University  
M.A., University of Oregon  
Ph.D., University of Oregon  

Faith A. Emmons  
Instructor—English (P)  
B.A., University of Virginia  
M.Ed., University of Virginia  

Paul G. English  
Professor—Business Management and Administration (C)  
B.S., University of Richmond  
B.A., University of Richmond  
M.B.A., Old Dominion University  
M.A., Old Dominion University  

Sharon W. Ezzell  
Instructor—Mathematics (C)  
A.S., Tidewater Community College  
B.S., Christopher Newport University  
M.A.T., Christopher Newport University  

Stephen M. Ezzell  
Associate Professor—Engineering (C)  
B.S., North Carolina State University  
M.S., Rollins College  
M.S., Naval Postgraduate School  

Stephanie M. Fair  
Instructor—Librarian (N)  
B.A., Oakland University  
M.A., Wayne State University  

Christopher S. Fairbanks  
Instructor—Air Conditioning and Refrigeration (P)  
A.A.S., Tidewater Community College  

Natasha Filipski  
Assistant Professor—Mathematics (N)  
B.A., University of Houston  
M.S., University of Houston  
Ph.D., University of Houston  

Heather L. Fitzgerald  
Instructor—Librarian  
A.S., Tidewater Community College  
B.A., Old Dominion University  
M.L.I.S., Florida State University  

Staci B. Forgey  
Assistant Professor—Biology (P)  
B.S., Niagara University  
M.S., Old Dominion University  

Holly A. Foster  
Assistant Professor—English (C)  
B.A., Northern Virginia Community College  
B.A., George Mason University  
M.A., George Mason University  
M.Ed., University of Virginia  
Ph.D., University of Virginia  

Mildred J. Fowler  
Associate Professor—Biology (V)  
B.S., Old Dominion University  
M.S.Ed., Old Dominion University  
Certificate, Eastern Virginia Medical School  

Glenn E. Fox, Jr.  
Professor—Psychology (C)  
B.S., Virginia Polytechnic Institute and State University  
M.A., Radford University  
Ph.D., Virginia Polytechnic Institute and State University  

Roger D. Frampton  
Professor—Chemistry (P)  
B.S., University of Durham U.K.  
Ph.D., University of East Anglia, Norwich, U.K.  

Edward B. Francis  
Professor—Art (P-VAC)  
B.S., Southern Connecticut State University  
M.F.A., Kent State University  

David J. French  
Associate Professor—Mathematics (C)  
B.S., Bluefield College  
M.A., Marshall University  

Deanna E. Freridge  
Instructor—Culinary Arts (N)  
A.A.S., Tidewater Community College  

Mary A. Froncillo  
Assistant Professor—Mathematics (V)  
A.A., Pensacola Junior College  
B.A., University of West Florida  
M.S., Old Dominion University
Heng R. Fu  
Associate Professor—Mathematics (V)  
B.S., Old Dominion University  
M.S., Old Dominion University

Laura E. Fuller  
Assistant Professor—English (V)  
B.A., Union University  
M.Ed., Memphis State University  
M.A., Old Dominion University

Mary H. Gable  
Instructor—Information Systems Technology (V)  
B.S., Old Dominion University

John R. F. Gallo  
Instructor—Mathematics (V)  
B.S., United States Military Academy  
M.S., George Washington University

Jessica H. Garber  
Assistant Professor—Chemistry (C)  
B.S., Virginia Commonwealth University  
Ph.D., Texas A & M University at College Station

George W. Garrett, Sr.  
Associate Professor—Mathematics (V)  
B.S., United States Naval Academy  
M.S., Naval Postgraduate School

Thomas L. Garrett, Jr.  
Associate Professor—Mathematics (P)  
B.A., University of Mississippi  
M.T.S., College of William and Mary  
M.S., Old Dominion University

Thomas M. Geary  
Assistant Professor—English (V)  
B.A., Christopher Newport University  
M.A., University of Maryland

Judith Gill  
Associate Professor—Mathematics (N)  
B.A., Christopher Newport University  
M.S., Old Dominion University

Richard W. Gill  
Associate Professor—Mathematics (N)  
B.S., College of William and Mary  
M.S., University of South Carolina

Kelly T. Gillerlain  
Professor—Business (C)  
B.A., American University  
M.B.A., Troy State University  
Ph.D., Regent University

Danielle G. Giscombe  
Instructor—Counselor (C)  
A.A., City College of Chicago at Harold Washington  
B.S., Southern Illinois University  
M.A., Norfolk State University

Carrie L. Gordon  
Instructor—Biology (V)  
B.S., Campbell University  
M.S., Virginia Polytechnic Institute and State University

Paul E. Gordy  
Associate Professor—Engineering (V)  
B.S.E.E., Old Dominion University  
M.E., Old Dominion University

Matthew S. Gorris  
Assistant Professor—Theatre Arts (C)  
B.G.S., Kent State University  
M.F.A., Kent State University

Rhonda R. Goudy  
Instructor—Counselor (C)  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.A., Norfolk State University

Phyllis E. Gowdy  
Assistant Professor—English (N)  
B.A., Western Maryland College  
M.A., Old Dominion University

Teresa A. Granger  
Associate Professor—Nursing (P)  
Diploma, Riverside School of Professional Nursing  
B.S.N., Christopher Newport University  
M.S.N., Hampton University
<table>
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<tr>
<th>Name</th>
<th>Title</th>
<th>Department</th>
<th>Institution</th>
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<tr>
<td>George C. Grant</td>
<td>Professor—Chemistry (V)</td>
<td>Tidewater Community College</td>
<td>B.A., Lehigh University&lt;br&gt;Ph.D., Rensselaer Polytechnic Institute</td>
</tr>
<tr>
<td>Gloria I. Grant</td>
<td>Professor—English (V)</td>
<td>Tidewater Community College</td>
<td>B.A., Old Dominion University&lt;br&gt;M.A., Old Dominion University&lt;br&gt;Ph.D., University of South Carolina</td>
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<tr>
<td>David C. Green</td>
<td>Associate Professor—Business Management and Administration (P)</td>
<td>Tidewater Community College</td>
<td>B.A., Wake Forest University&lt;br&gt;M.B.A., George Washington University</td>
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<td>Mark D. Greer</td>
<td>Assistant Professor—Physics (V)</td>
<td>Tidewater Community College</td>
<td>B.A., Old Dominion University&lt;br&gt;M.S., Old Dominion University</td>
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<tr>
<td>Star G. Grieser</td>
<td>Associate Professor—American Sign Language (C)</td>
<td>Tidewater Community College</td>
<td>B.S., Rochester Institute of Technology</td>
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<tr>
<td>Kimberly W. Griffin</td>
<td>Assistant Professor—Mathematics (N)</td>
<td>Tidewater Community College</td>
<td>B.S., North Carolina State University&lt;br&gt;M.S., Elizabeth City State University</td>
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<tr>
<td>Lindsey F. Grilliot</td>
<td>Assistant Professor—Physical Therapy (V)</td>
<td>Tidewater Community College</td>
<td>B.S., College of William &amp; Mary&lt;br&gt;M.S., Virginia Commonwealth University-Medical College of Virginia</td>
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<tr>
<td>Kenneth P. Grimes</td>
<td>Assistant Professor—Engineering (V)</td>
<td>Tidewater Community College</td>
<td>B.S., Kettering University&lt;br&gt;M.S., Purdue University&lt;br&gt;M.Ed., Ferris State University</td>
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<tr>
<td>Joseph W. Grimsley</td>
<td>Associate Professor—History (V)</td>
<td>Tidewater Community College</td>
<td>B.A., University of North Carolina at Greensboro&lt;br&gt;M.A., North Carolina State University&lt;br&gt;Ph.D., Mississippi State University</td>
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<td>Robert O. Guess II</td>
<td>Associate Professor—Information Systems Technology (C)</td>
<td>Tidewater Community College</td>
<td>B.G.S., Virginia Commonwealth University&lt;br&gt;M.S., Norwich University</td>
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<tr>
<td>Karla O. Guilford-Shipp</td>
<td>Instructor—English (V)</td>
<td>Tidewater Community College</td>
<td>B.A., University of Alabama&lt;br&gt;M.Ed., Troy State University&lt;br&gt;M.Ed., University of Alabama</td>
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<td>Leah E. Hagedorn</td>
<td>Professor—History (N)</td>
<td>Tidewater Community College</td>
<td>B.A., Goucher College&lt;br&gt;M.A., University of North Carolina at Chapel Hill&lt;br&gt;Ph.D., University of North Carolina at Chapel Hill</td>
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<tr>
<td>Jamie M. Haines</td>
<td>Instructor—English (P)</td>
<td>Tidewater Community College</td>
<td>B.A., Slippery Rock University&lt;br&gt;M.A., Slippery Rock University</td>
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<td>Shana L. Haines</td>
<td>Assistant Professor—English (P)</td>
<td>Tidewater Community College</td>
<td>B.S., Texas Christian University&lt;br&gt;J.D., Boston University School of Law&lt;br&gt;M.A., Hunter College</td>
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<td>Donald V. Haley</td>
<td>Associate Professor—Administration of Justice (V)</td>
<td>Tidewater Community College</td>
<td>A.A.S., Tidewater Community College&lt;br&gt;B.A., Saint Leo University&lt;br&gt;M.P.A., Troy State University</td>
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<td>Ferdinand V. Hallare</td>
<td>Assistant Professor—Mathematics (V)</td>
<td>Tidewater Community College</td>
<td>B.S., University of Philippines&lt;br&gt;M.S., University of Philippines&lt;br&gt;M.A., University of Kansas</td>
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<td>Eldridge C. Hamm, Jr.</td>
<td>Professor—Business Management and Administration (V)</td>
<td>Tidewater Community College</td>
<td>B.S., University of Richmond&lt;br&gt;M.S., Virginia Commonwealth University&lt;br&gt;Ed.D., Vanderbilt University</td>
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<td>Kia L. Hardy</td>
<td>Instructor—Counselor (N)</td>
<td>Tidewater Community College</td>
<td>B.A., College of William and Mary&lt;br&gt;M.Ed., College of William and Mary</td>
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<td>Thomas J. Hargrove</td>
<td>Professor—English (C)</td>
<td>B.A., Fordham College&lt;br&gt;M.A., Fordham College&lt;br&gt;Ph.D., St. John's University</td>
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<td>Alexandra Harrington</td>
<td>Instructor—Librarian (V)</td>
<td>B.A., Christopher Newport University&lt;br&gt;M.L.I.S., University of Alabama</td>
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<td>Elise B. Harris</td>
<td>Assistant Professor—Mathematics (V)</td>
<td>B.S., Norfolk State University&lt;br&gt;M.S.Ed., Old Dominion University</td>
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<td>Siabhon M. Harris</td>
<td>Associate Professor—Biology (P)</td>
<td>B.S., North Carolina State University&lt;br&gt;Ph.D., Eastern Virginia Medical School</td>
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<td>Katina L. Harris-Carter</td>
<td>Assistant Professor—Biology (P)</td>
<td>B.S., Western Illinois University&lt;br&gt;M.S., Hampton University</td>
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<td>Evgenia Harrison</td>
<td>Instructor—Mathematics (C)</td>
<td>B.S., Novosibirsk State University&lt;br&gt;M.S., George Washington University</td>
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<tr>
<td>Robert E. Harrison</td>
<td>Instructor—Librarian (C)</td>
<td>B.A., Clarion University&lt;br&gt;M.S.L.S., Clarion University</td>
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<td>Alison H. Harwell</td>
<td>Associate Professor—Counselor (V)</td>
<td>B.S., Cornell University&lt;br&gt;M.S., Cornell University</td>
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<td>Lynette K. Hauser</td>
<td>Assistant Professor—Biology (P)</td>
<td>B.A., Goucher College&lt;br&gt;M.S., University of Virginia</td>
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<tr>
<td>Robert H. Hawkes</td>
<td>Professor—Arts (P-VAC)</td>
<td>B.F.A., Virginia Commonwealth University&lt;br&gt;M.F.A., Ohio University</td>
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<tr>
<td>Eric T. Hayes</td>
<td>Professor—Chemistry (C)</td>
<td>B.S., Virginia Polytechnic Institute and State University&lt;br&gt;M.S., University of Cincinnati&lt;br&gt;Ph.D., University of Cincinnati</td>
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<tr>
<td>George B. Hept</td>
<td>Assistant Professor—Physics (C)</td>
<td>B.S., U.S. Air Force Academy&lt;br&gt;M.S., Massachusetts Institute of Technology&lt;br&gt;M.S., Air War College</td>
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<tr>
<td>Christy A. Hewett</td>
<td>Assistant Professor—Mathematics (V)</td>
<td>B.S., Southern Illinois University&lt;br&gt;M.S., Southern Illinois University</td>
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<tr>
<td>Rosemary S. Hill</td>
<td>Professor—Arts (P-VAC)</td>
<td>B.F.A., University of Mississippi&lt;br&gt;M.Ed., University of Memphis&lt;br&gt;M.F.A., Louisiana State University</td>
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<tr>
<td>Thomas P. Hilton</td>
<td>Associate Professor—Philosophy (V)</td>
<td>B.S., East Tennessee State University&lt;br&gt;M.A., East Tennessee State University&lt;br&gt;M.A., Old Dominion University</td>
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<tr>
<td>David S. Hodge</td>
<td>Instructor—Librarian (Center for eLearning)</td>
<td>B.S., Pennsylvania State University&lt;br&gt;M.S.L.S., Clarion University</td>
<td></td>
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<tr>
<td>Ellyn J. Hodgis</td>
<td>Associate Professor—Radiologic Technology (V)</td>
<td>A.A.S., Tidewater Community College&lt;br&gt;B.S., Old Dominion University&lt;br&gt;M.Ed., Troy State University</td>
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<tr>
<td>James R. Holden</td>
<td>Professor—Biology (N)</td>
<td>B.S., Ohio Northern University&lt;br&gt;M.S., Clemson University&lt;br&gt;Ph.D., University of Northern Colorado</td>
<td></td>
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<tr>
<td>Jack L. Hollinger</td>
<td>Professor—Speech and Drama (V)</td>
<td>B.A., Tusculum College&lt;br&gt;M.F.A., Ohio University</td>
<td></td>
</tr>
</tbody>
</table>
Catherine D. Holroyd  
Professor—Chemistry (V)  
B.S., University of Richmond  
Ph.D., University of Virginia

Richard L. Holtz  
Associate Professor—Administration of Justice (V)  
A.A., Old Dominion University  
B.A., Old Dominion University

Diana B. Homsi  
Assistant Professor—Biology (V)  
B.S., Old Dominion University  
M.S., Old Dominion University

C. Gregory Hood  
Professor—Physics (V)  
B.S., Massachusetts Institute of Technology  
M.A., Boston University  
Ph.D., Boston University

Jeanne E. Hopkins  
Assistant Professor—Early Childhood Education (P)  
B.S., Mount Olive College  
M.S., NOVA Southeastern University

Jennifer D. Hopkins  
Assistant Professor—Interior Design (C)  
B.E.D.A., North Carolina State University  
M.A., University of New Mexico

Dale R. Horeth  
Associate Professor—Biology (V)  
A.S., Tidewater Community College  
B.S., University of New York at Regents College  
M.S., Old Dominion University

Dale R. Horton  
Instructor—Physics (C)  
B.S., University of Illinois  
M.S., University of Illinois

Robert E. House, Jr.  
Assistant Professor—English (V)  
B.A., Bard College  
M.A., University of Colorado

David E. Howell  
Instructor—Automotive Technology (C-RAC)  
B.S., Old Dominion University

Cornelius Matthew Isaac  
Instructor—Trucking (P)  
Commercial Driver’s License

Frances M. Jacobson  
Professor—History (V)  
B.A., Old Dominion University  
M.A., Old Dominion University  
Ph.D., Old Dominion University

Richard James  
Assistant Professor—Administration of Justice (P)  
B.A., St. Leo University  
M.A., Regent University

Tariq O. Jawhar  
Associate Professor—English (V)  
B.A., Old Dominion University  
M.A., Old Dominion University  
D.L., Drew University

Doris O. Jellig  
Associate Professor—English (V)  
B.A., Cabrini College  
M.S.Ed., St. John’s University

William D. Jenkins  
Professor—Marketing and Economics (V)  
B.A., University of North Carolina  
M.B.A., University of North Carolina at Chapel Hill  
Ph.D., University of North Carolina at Chapel Hill

Cecelia L. Johnson  
Assistant Professor—Biology (N)  
B.S., University of Mary Washington  
M.S., Old Dominion University

Kimberly O. Jones  
Associate Professor—Funeral Services (V)  
A.A.S., University of the District of Columbia  
B.S., Old Dominion University  
M.L.S., University of Maryland
Valerie M. Jones  
Professor—Business Management and Administration (V)  
B.S., Virginia State University  
M.B.A., Old Dominion University  

Joseph Joyner, Jr.  
Associate Professor—Mathematics (N)  
B.G.S., Roosevelt University  
B.S., C.W. Post College  
M.A., City University of New York at Herbert H. Lehman College  

Peter Kane  
Associate Professor—Hotel Restaurant Management (V)  
A.A., Suffolk County Community College  
A.O.S., Culinary Institute of America  
B.S., Florida International University  
M.S., Troy State University  

Lisa Y. Kern-Lipscomb  
Instructor—English (P)  
B.A., Norfolk State University  
M.A., Old Dominion University  

Rhonda T. Kessling  
Assistant Professor—Art History (P-VAC)  
B.A., Wayne State University  
M.A., Michigan State University  

David J. Kiracofe  
Professor—History (C)  
B.A., College of William and Mary  
M.A., University of Connecticut  
Ph.D., University of Connecticut  

Michael D. Kirby  
Assistant Professor—Mathematics (V)  
B.A., Christopher Newport University  
M.S., College of William and Mary  

Albert V. Koon  
Associate Professor—Electricity/Electronics (V)  
A.A.S., Tidewater Community College  

Ruth G. Kopanski  
Professor—Nursing (P)  
B.S., Duquesne University  
M.A., Webster University  
M.S.N., Widener University  

Harlan R. Krepcik  
Associate Professor—Air Conditioning & Refrigeration (P)  
A.A.S., Tidewater Community College  
A.S., Tidewater Community College  
B.S., New York Institute of Technology  
M.S., New York Institute of Technology  

Robert S. Kunzinger  
Associate Professor—English (V)  
B.A., St. Bonaventure University  
M.A., Pennsylvania State University  
M.F.A., Old Dominion University  

Sean S. LaCroix  
Assistant Professor—Economics (C)  
B.A., North Carolina State University  
M.S., University of North Carolina at Charlotte  

Samuel H. Lamb II  
Professor—Psychology (V)  
B.S., Old Dominion University  
M.S.Ed., Old Dominion University  
Ed.D., Virginia Polytechnic Institute and State University  
C.A.G.S., Virginia Polytechnic Institute and State University  
C.A.S., Old Dominion University  

Helena Liberty Lancer  
Lecturer—English (P)  
B.A., Oklahoma Baptist University  
M.A., Old Dominion University  

Sonya L. Landas  
Professor—Psychology (V)  
B.S., Old Dominion University  
M.S., Western Washington University  
Ph.D., Old Dominion University  

Edmond P. LaSalle  
Instructor—English (P)  
B.A., Charter Oak State College  
M.A., State University of New York - Excelsior College  

Derek Laws  
Assistant Professor—Chemistry (P)  
B.S., Framingham State University  
Ph.D., University of Vermont  

Laurie M Lawson  
Lecturer—Biology (V)  
B.A., University of Virginia  
M.Ed., University of Virginia
David L. Lee  
Instructor—Automotive Technology (C-RAC)  
A.A.S., Tidewater Community College

Amanda V. Leo  
Associate Professor—Occupational Therapy (V)  
B.S., Duquesne University  
M.S., Duquesne University

Lydia A. Leporte  
Professor—Accounting (V)  
B.S., University of Pennsylvania  
M.A., American University  
M.A.C.C., University of West Florida

Donald D. Liburd  
Instructor—English (N)  
B.S., Liberty University  
M.A., Old Dominion University

Corinne V. Lilyard-Mitchell  
Professor—Arts (P-VAC)  
A.A., Tidewater Community College  
B.A., Norfolk State University  
M.F.A., Norfolk State University

L. Muriel Locke  
Associate Professor—Mathematics (C)  
B.S.Ed., Temple University  
M.A., University of North Carolina at Charlotte

Theresa A. Long  
Associate Professor—Nursing (P)  
A.A.S., Tidewater Community College  
B.S., Rutgers University  
M.S., Virginia Commonwealth University  
D.N.P., University of Virginia

Kimberly A. Lott  
Assistant Professor—Nursing (P)  
A.D.N., Florida Community College  
B.S., California State University  
M.S.N., Old Dominion University

Michael E. Lyle  
Assistant Professor—Geophysical Sciences (V)  
B.S., Old Dominion University  
M.S., East Carolina University

Shahin Maaref  
Associate Professor—Chemistry (V)  
B.S., Pedagogical University  
M.S., Azad University  
Ph.D., State University of New York

Anne F. Mach  
Associate Professor—Emergency Medical Services (V)  
B.S.N., University of Phoenix

Laura Lea M. MacIntyre  
Instructor—Mathematics (P)  
A.S., Tidewater Community College  
B.S., Norfolk State University  
M.A., Hampton University

Claudia D. Macon  
Assistant Professor—Business Management and Administration (V)  
B.S., Old Dominion University  
M.B.A., Old Dominion University

William M. Marcil  
Associate Professor—Occupational Therapy (V)  
A.A.S., Maria College  
B.S., State University of New York at Buffalo  
M.S., State University of New York at Buffalo  
Ph.D., Regent University

Michele A. Marits  
Assistant Professor—English (V)  
B.A., Old Dominion University  
M.A., Old Dominion University

Kathleen A. Masciangelo  
Associate Professor—Emergency Medical Services (V)  
B.S.N., West Virginia University  
M.S., Old Dominion University

Angela C. Mason  
Instructor—Biology (C)  
B.S., University of Cincinnati  
M.S., Ohio University

Robert A. Maynard  
Associate Professor—Mathematics (V)  
B.S., Ohio State University  
M.S., Ohio State University  
M.E., Old Dominion University
Monica Lynn McFerin
Assistant Professor—English (V)
B.A., James Madison University
M.A., Old Dominion University

Thomas J. McHugh
Associate Professor—Chemistry (N)
B.S., Old Dominion University
M.S., Old Dominion University
Ph.D., Arizona State University

Iain McKaig
Professor—Mathematics (V)
B.A., Virginia Wesleyan College
M.S., Old Dominion University
Ph.D., Old Dominion University

William McNamara
Assistant Professor—Information Systems Technology (V)
A.A., Saint Leo University
B.A., Saint Leo University

Chelsey A. McSwain
Instructor—Counselor (N)
B.A., Minnesota State University Moorehead
M.A., South University

Arthur A. Mendonsa
Professor—Information Systems Technology (C)
B.S., United States Naval Academy
M.S., Old Dominion University

Catherine K. Merritt
Assistant Professor—Nursing (P)
A.S., Tidewater Community College
B.S., Old Dominion University
M.S., Walden University

Annette S. Mewborn
Instructor—English (V)
A.S., Tidewater Community College
B.A., Norfolk State University
M.A., Old Dominion University

Linda K. Miller
Associate Professor—Spanish (V)
B.A., College of William and Mary
M.A., University of Virginia

Wallace E. Miller
Instructor—Trucking (P)
Commercial Driver’s License

Richard A. Mims
Assistant Professor—Welding (P)

Amber-Leigh D. Mitchell
Instructor—Emergency Medical Services (V)
A.A.S., Tidewater Community College
B.A., Virginia Wesleyan College
M.P.A., Walden University

Dana C. Mitchell
Instructor—Mathematics (P)
B.S., Virginia Polytechnic Institute and State University
M.B.A., Old Dominion University
M.A., University of North Carolina in Charlotte

Michael H. Mitchell
Professor—Biology (C)
A.S., Tidewater Community College
B.S., Old Dominion University
M.S., Old Dominion University
Ph.D., Old Dominion University

Lotlamoreng G. Mosiane
Instructor—Mathematics (N)
B.S., Hampton University
M.S., Hampton University

Ryan M. Muldowney
Assistant Professor—Studio Arts (P-VAC)
B.F.A., University of the Arts
M.F.A., Pennsylvania Academy of the Fine Arts

Debra M. Murray
Associate Professor—Nursing (P)
B.S.N., Pennsylvania State University
M.H.R., University of Oklahoma
M.S.N., University of Virginia
D.N.P., University of Virginia

Grace T. Murray
Instructor—Biology (N)
A.S., Pensacola Junior College
B.S., Old Dominion University
M.S., Old Dominion University
Cheryl Nabati  
_Instructor—Librarian (V)_  
B.S., Buffalo State College  
M.L.S., University of New York at Buffalo

David P. Neff  
_Professor—History (V)_  
B.S., Jacksonville University  
M.A., Old Dominion University  
M.A., Georgetown University  
D.A., George Mason University

P. Charlotte Jarrett Newsom  
_Associate Professor—Mathematics (V)_  
B.S., Howard College  
M.S., Florida State University

Jesse W. Newton  
_Assistant Professor—Philosophy (P)_  
B.A., Atlanta Christian College  
M.A., Biola University  
Ph.D., University of Virginia

Angela S. Nichols  
_Assistant Professor—Nursing (P)_  
B.S.N., Virginia Commonwealth University  
M.S.N., Liberty University

Craig A. Nilsen  
_Professor—Arts (P-VAC)_  
B.A., University of Delaware  
M.F.A., West Virginia University

Gary D. Noah  
_Professor—Information Systems Technology (V)_  
B.S., Embry-Riddle Aeronautical University  
M.P.A., Valdosta State University  
M.S., Strayer University

Larry G. Nobles  
_Instructor—Automotive Technology (C - RAC)_  
A.A.S., Tidewater Community College

Robert C. Noyes  
_Assistant Professor—Counselor (P)_  
B.A., Brown University  
M.Ed., University of Virginia

Karl H. Oyster, Jr.  
_Assistant Professor—Psychology (V)_  
B.S., Ohio University  
M.A., Ball State University

William A. Paquette  
_Professor—History (P)_  
A.B., Grove City College  
M.A., Duquesne University  
Ph.D., Emory University

Darryl L. Parker  
_Instructor—Automotive Technology (C)_  
A.A.S., Tidewater Community College

Pamela H. Parker  
_Assistant Professor—Accounting (P)_  
B.S., Chowan University  
M.S., Strayer University

Anne M. Parrella  
_Professor—History (C)_  
A.B., Indiana State University  
M.A., University of Virginia Ph.D., University of Virginia

Antonio Passaro, Jr.  
_Assistant Professor—Administration of Justice (N)_  
A.S., Tidewater Community College  
B.A., Virginia Wesleyan College  
M.A., Norfolk State University

Marilyn L. Peacock  
_Professor—Mathematics (N)_  
B.S., James Madison University  
M.S., College of William and Mary  
Ph.D., Old Dominion University

Andrea A. Pearman  
_Assistant Professor—Speech (V)_  
B.A., Maryville College  
M.A., Regent University

William W. Pearsall  
_Associate Professor—Administration of Justice (C)_  
A.A.S., Northern Virginia Community College  
B.A., National-Louis University  
J.D., Appalachian School of Law
<table>
<thead>
<tr>
<th>Name</th>
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</tr>
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</table>
| Cynthia H. Pedigo             | Associate Professor—Legal Assisting (V)         | B.A., James Madison University  
J.D., College of William and Mary |
| Katherine L. Pennington       | Associate Professor—Nursing (P)                | B.S.N., University of Virginia  
M.S.N., Old Dominion University |
| Kimberly A. Perez             | Professor—Information Systems Technology (V)   | B.A., Chatham College  
M.S., University of Maryland  
M.S., Strayer University  
M.S.I.S., Strayer University  
C.A.G.S., Strayer University |
| Mozell J. Person              | Assistant Professor—Psychology (P)             | B.A., Chowan University  
M.A., Norfolk State University |
| Jimmy L. Peterson             | Professor—Sociology (N)                        | B.S., Alabama State University  
M.S., University of Wisconsin  
Ph.D., University of Michigan |
| Cecelia S. Petretto           | Instructor—English (V)                         | B.A., Old Dominion University  
M.A., Old Dominion University |
| Diane M. Pettway              | Associate Professor—Emergency Medical Services (V) | A.S., Norfolk State University  
B.S., Norfolk State University  
M.S., California College for Health Sciences |
| Anne M. Pinkerton             | Professor—Biology (N)                          | B.S., College of William and Mary  
M.A., State University of New York at Binghamton  
Ph.D., Eastern Virginia Medical School |
| Michael C. Plumb              | Professor—Industrial Engineering (V)           | B.S., University of Louisville  
M.B.A., Golden Gate University  
Ph.D., Old Dominion University |
| Debra A. Sills Porter         | Associate Professor—Accounting (V)             | B.B.A., University of Memphis  
M.S., University of Memphis |
| Drucilla U. Powell            | Assistant Professor—Information Systems Technology (N) | B.S., Old Dominion University |
| Nancy N. Prather-Johnson      | Assistant Professor—Business Administration (P) | B.S., Johnson & Wales University  
M.B.A., Johnson & Wales University |
| John H. Pruden III            | Assistant Professor—Industrial Engineering Technology (V) | B.S., Virginia Polytechnic Institute and State University  
M.E.A., George Washington University |
| Karin A. Pryor                | Assistant Professor—English (C)                | B.A., Marietta College  
M.A., Bowling Green State University  
M.Ed., Bowling Green State University |
| Tiffany A. Putman             | Instructor—Counselor (CMVE)                     | B.S., Savannah State University  
M.S., Fort Valley State University |
| Susanne G. Rauch              | Instructor—English (V)                         | A.A., Antelope Valley Community College  
B.A., California State University  
M.A., California State University |
| William G. Reese, Jr.         | Assistant Professor—Economics (V)              | B.S., Old Dominion University  
M.A., Old Dominion University |
| William G. Reid               | Professor—English (N)                          | B.A., Old Dominion University  
M.A., Old Dominion University  
M.F.A., University of Alabama |
Olivia J. Reinauer  
_Instructor—Librarian (P)_  
B.A., University of Texas  
M.S., University of Texas

Joseph E. Reish  
_Associate Professor—Psychology (P)_  
B.S., Virginia Polytechnic Institute and State University  
M.A., Radford University

Rina M. Reynolds  
_Associate Professor—Nursing (P)_  
B.S.N., Virginia Commonwealth University  
M.S., Virginia Commonwealth University

Patricia L. Richardson  
_Associate Professor—English (V)_  
B.S., Saint Paul's College  
M.A., Virginia State University

James T. Riffe  
_Instructor—Trucking (P)_  
Certificate, Tidewater Community College

David L. Ring  
_Assistant Professor—English (C)_  
B.A., University of Notre Dame  
M.A., University of New Orleans  
M.A., University of Maryland

Richard S. Roane, Jr.  
_Instructor—Reference Librarian (P)_  
B.S., James Madison University  
M.S., University of North Texas

James N. Roberts  
_Assistant Professor—Economics (V)_  
B.A., Cleveland State University  
M.A., Michigan State University

Harley W. Robertson  
_Instructor—Diesel Technology (C-RAC)_  
Certificate, Automotive Technology

Adriel L. Robinson  
_Instructor—Mathematics (C)_  
A.S., Allegany College of Maryland  
B.A., Houghton College  
M.S., West Virginia University

William S. Rodner  
_Professor—History (V)_  
B.A., Mansfield University  
M.A., Pennsylvania State University  
Ph.D., Pennsylvania State University

Vickie H. Rogers  
_Instructor—Counselor (V)_  
B.S., Virginia Commonwealth University  
M.B.A. Virginia Commonwealth University

Gary W. Rose  
_Assistant Professor—Welding (P)_  
A.A., Saint Leo College  
A.A., Air Force Training Command

Sylvia T. Ross  
_Associate Professor—English (N)_  
B.A., University of Notre Dame  
M.A., University of Miami

Bobby G. Rowe, Jr.  
_Instructor—Automotive Technology (C-RAC)_  
A.A.S., Tidewater Community College

Bobby G. Rowe, Sr.  
_Associate Professor—Automotive Technology (C-RAC)_  
A.A.S., Tidewater Community College  
A.A., State University of New York at Albany  
B.S., State University of New York at Albany  
M.S., Troy State University

Amy L. Ruedisueli  
_Professor—Sociology (V)_  
B.S., Eastern Michigan University  
M.A., Eastern Michigan University

Cameron L. Russell  
_Assistant Professor—Biology (N)_  
B.S., Old Dominion University  
M.S., Old Dominion University

Sirje Kaasik Russell  
_Instructor—English as a Second Language (V)_  
B.A., Mount Vernon College  
M.Ed., Temple University
Diane N. Ryan  
**Assistant Professor—Speech (V)**  
B.A., Western Illinois University  
M.A., Western Illinois University

Laura Rieves Sanders  
**Instructor—Psychology (V)**  
B.S., Old Dominion University  
M.S., Old Dominion University

Carolyn D. Satz  
**Associate Professor—Accounting (C)**  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.T., Old Dominion University

Elizabeth Elaine W. Schleeper  
**Instructor—English (P)**  
A.S., Tidewater Community College  
B.A., Old Dominion University  
M.A., Old Dominion University

Mario R. Scribner  
**Assistant Professor—Mathematics (V)**  
B.S., Old Dominion University  
M.S., Old Dominion University

Robin L. Seymore  
**Associate Professor—Psychology (V)**  
B.A., College of William and Mary  
M.A., Regent University  
M.A., Regent University  
Psy.D., Regent University

Indu J. Sharma  
**Associate Professor—Diagnostic Medical Sonography (V)**  
A.S., Tidewater Community College  
A.S., Tidewater Community College  
B.A., College of William and Mary  
M.A., Troy State University

Peter M. Shaw  
**Professor—Business Management and Administration (N)**  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.B.A., College of William and Mary

Amy K. Shay  
**Instructor—Health Information Management (V)**  
A.A.S., Tidewater Community College  
B.S., Old Dominion University

William L. Sherrill  
**Professor—Economics (N)**  
A.A., Old Dominion University  
B.S., Old Dominion University  
M.A., Old Dominion University

Richard L. Shoaf  
**Professor—History (P)**  
A.B., University of North Carolina at Chapel Hill  
M.A., Harvard University  
Ph.D., Harvard University

Ruth H. Shumate  
**Assistant Professor—Librarian (P)**  
A.S., Tidewater Community College  
B.Ed., Old Dominion University  
M.S.L.S., Catholic University of America

Thomas D. Siegmund  
**Professor—Photography (P-VAC)**  
B.F.A., Old Dominion University  
M.F.A., Norfolk State University

Frank J. Signorelli  
**Instructor—Emergency Medical Services (V)**  
A.S., Tidewater Community College  
B.S., Old Dominion University

William A. Simmons  
**Instructor—Engineering (C)**  
A.S., Tidewater Community College  
B.S.E.E., Old Dominion University  
M.E.E.E., Old Dominion University

Dania O. Sinibaldi  
**Instructor—Mathematics (V)**  
B.S., Old Dominion University  
M.S., Montana State University

Angela L. Slaughter  
**Assistant Professor—Business Management & Administration (P)**  
B.S., Old Dominion University  
M.S., Averett University

Tiffanye P. Sledge  
**Associate Professor—Sociology (P)**  
B.A., Spelman College  
M.A., Arizona State University  
Ph.D., Arizona State University
Viola A. Smith
Associate Professor—Nursing (P)
B.S., Indiana University of Pennsylvania
M.S., Indiana University of Pennsylvania

Gregory L. Snyder
Instructor—Librarian Cataloging & Technical Services (V)
B.A., University of Houston
B.A., University of Houston
M.S., University of North Texas

Kathryn T. Sourbeer
Instructor—Biology (C)
B.S., Old Dominion University
M.S., Old Dominion University

William Ken Spencer
Professor—Horticulture (C)
B.A., University of North Carolina at Chapel Hill
B.S., North Carolina State University
M.S., Virginia Polytechnic Institute and State University

Maura J. Spreen
Instructor—Counselor (V)
B.A., St. Ambrose University
M.S.Ed., Old Dominion University

Ian Thomas Springer
Instructor—English (V)
B.S., Michigan Technological University
M.A., Eastern Michigan University

Crystal S. Stafford
Instructor—Counselor (V)
B.A., Longwood University
B.S., Old Dominion University
M.S.Ed., Old Dominion University

Dianne H. Stanbach
Instructor—English (V)
B.A., California State University
M.A., California State University

Bonita G. Startt
Assistant Professor—English (V)
B.S., Old Dominion University
M.S.Ed., Old Dominion University

David A. Steinhauer
Professor—Drafting (P)
B.S.Ed., Kent State University
M.S.Ed., Old Dominion University

Sarah Stevenson
Instructor—English & Reading (Developmental) (C)
B.A., Old Dominion University
M.S., Old Dominion University

Laetitia S. Stone
Associate Professor—French (V)
B.A., Old Dominion University
M.A., Old Dominion University

Thomas B. Stout
Associate Professor—Electromechanical Controls Technology (C)
A.S., Tidewater Community College
B.S.E.T., Old Dominion University
M.S., Norfolk State University

Martha R. Sugermeyer
Associate Professor—Biology (V)
A.A., Pensacola Junior College
B.A., Florida State University
M.S., Old Dominion University

Robert B. Sulzberger
Associate Professor—Biology
B.S., College of William and Mary
M.S., College of William and Mary
M.S., George Washington University

Tricia J. Swoope
Instructor—English (V)
B.A., Old Dominion University
M.A., Old Dominion University

Azam M. Tabrizi
Instructor—Geophysical Science (C)
B.S., Tabriz University
M.S., University of London

Michael P. Tarpey
Instructor—Philosophy (C)
B.A., Calvin College
M.A., Old Dominion University
M.A., Old Dominion University
Eugenia B. Taylor  
Associate Professor—Mathematics (C)  
B.S., University of South Carolina  
M.A., College of William and Mary

Lara B. Tedrow  
Associate Professor—Psychology (N)  
B.S., Old Dominion University  
M.S., Old Dominion University  
M.S.Ed., Old Dominion University

C. Gregg Tennefoss  
Professor—Information Systems Technology (V)  
A.A.S., Tidewater Community College  
B.S., Old Dominion University  
M.S.Ed., Old Dominion University

Douglas M. Thiele  
Instructor—English (C)  
B.S., Indiana University  
M.A., Indiana University

Louis M. Tinaro III  
Professor—Information Systems Technology (V)  
B.S., Old Dominion University  
M.B.A., Old Dominion University  
Certificate in Data Processing

Suki E. Tooley  
Assistant Professor—English (N)  
B.A., Christopher Newport University  
M.A., University of Kansas

Felicia M. Toreno  
Professor—Diagnostic Medical Sonography (V)  
A.S., Butler University  
B.S., Butler University  
M.S.Ed., Old Dominion University  
Ph.D., Old Dominion University

Manisha N. Trivedi  
Instructor—Biology (N)  
B.S., St. Xavier’s College  
M.S., Gujarat State University  
M.S., Old Dominion University

Cynthia M. Tucker  
Assistant Professor—Nursing (P)  
Diploma, Riverside School of Professional Nursing  
B.S., Virginia Commonwealth University  
M.S.N., Liberty University

Vincent Tucker, Jr.  
Instructor—Mathematics (P)  
B.S., Norfolk State University  
M.S., Hampton University

Cynthia Ann Tumility  
Assistant Professor—Nursing (P)  
A.D.N., Norfolk State University  
B.S.N., University of Phoenix  
M.S.N. Ed., University of Phoenix

Robert C. Tyler  
Instructor—Counselor (P)  
B.A., Johnson State University  
M.S., City University of New York at Hunter College

Kim B. Utley  
Professor—Radiologic Technology (V)  
A.A.S., Central Virginia Community College  
B.S., Old Dominion University  
M.S., Old Dominion University

Jennifer A. Valentine  
Instructor—Sociology (V)  
B.A., Virginia Wesleyan College  
M.S., Virginia Commonwealth University

David M. Vann  
Instructor—Trucking (P)  
Commercial Driver’s License

Elizabeth M. Vihnanek  
Assistant Professor—Librarian (V)  
B.A., Concordia College Teachers College  
M.A., Concordia College  
M.L.S., Dominican University

Bonita J. Volker  
Associate Professor—Information Systems Technology (N)  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.B.A., Old Dominion University

Rebecca L. Vonderhaar  
Instructor—Sociology (P)  
A.S., Tidewater Community College  
B.S., Old Dominion University  
M.S., Old Dominion University
Scotty E. Wade  
Assistant Professor—History (V)  
A.A.S., Mountain Empire Community College  
B.A., University of Virginia at Wise  
M.A., George Mason University

G. Nicole Walker  
Assistant Professor—Counselor (N)  
B.A., Saint Paul's College  
M.A., Hampton University  
M.S., Troy State University

Kimberly A. Wallace  
Assistant Professor—Biology (N)  
B.S., Old Dominion University  
M.S., Eastern Medical School of Virginia  
Ph.D., Eastern Medical School of Virginia

Joseph F. Walton  
Assistant Professor—Funeral Services (V)  
A.S., Gupton-Jones College  
B.S., Hampton University  
M.A., Norfolk State University

Ivory J. Warren  
Assistant Professor—Human Services (N)  
B.S.W., Norfolk State University  
M.S.W., Norfolk State University

Jacqueline M. Warren  
Professor—Administrative Support Technology (V)  
A.A., Old Dominion University  
B.S., Old Dominion University  
M.S.Ed., Virginia Polytechnic Institute and State University

Shannon L. Washington  
Assistant Professor—Nursing (P)  
Diploma, Riverside School of Professional Nursing  
M.S.N., Walden University

Joshua L. Waters  
Instructor—Trucking (P)  
Certificate, Tidewater Community College

Libby A. Watts  
Instructor—Mathematics (N)  
A.S., Monroe Community College  
B.A., State University of New York at Geneseo  
M.A., State University of New York at Potsdam

Matthew K. Watts  
Assistant Professor—Mathematics (C)  
B.S., James Madison University  
M.S., University of Arizona

Debra A. Wells  
Professor—Administrative Systems Technology (P)  
B.S., Norfolk State University  
M.Ed., Regent University

Mark J. Wheaton  
Instructor—Chemistry (N)  
B.S., Hampden-Sydney College  
M.A., University of Arizona

Lisa L. Whitaker  
Instructor—Health Information Management  
B.S., Virginia Commonwealth Universit

Carole B. Whitener  
Associate Professor—Early Childhood Development (C)  
B.A., West Virginia University  
M.A., Ohio State University

Steven Jo Whitney  
Instructor—Automotive Technology (C)  
A.A.S., Tidewater Community College

Carolyn W. Williams  
Instructor—Counselor (V)  
B.S., Fayetteville State University  
M.A.Ed., East Carolina University

John T. Williams, Jr.  
Associate Professor—English (V)  
B.A., Waynesburg College  
M.A., Fitchburg State College

Judy H. Williams  
Associate Professor—Mathematics (V)  
B.A., Frostburg State College  
M.A., West Virginia University
Linda S. Williams  
*Professor—Business Management and Administration (C)*  
B.A., University of Richmond  
M.B.A., East Carolina University  
M.S., Strayer University

Michael J. Williams  
*Instructor—Biology (P)*  
B.S., State University of New York at Geneseo  
M.S., University of Charleston

Mike Williams  
*Associate Professor—English (C)*  
A.A., Navarro College  
B.A., Stephen F. Austin State University  
M.A., Stephen F. Austin State University  
Ed.S., Nova Southeastern University

Emily L. Wilson  
*Associate Professor—Biology (P)*  
B.A., University of Florida  
Ph.D., University of Miami School of Medicine

Marc C. Wingett  
*Instructor—Biology (C)*  
B.S., Virginia Polytechnic Institute and State University  
B.S., Old Dominion University  
M.S., Old Dominion University

David L. Winters  
*Associate Professor—Chemistry (V)*  
B.S., West Virginia State College  
M.S., West Virginia University

Nita B. Wood  
*Associate Professor—English (P)*  
B.A., Norfolk State University  
M.A., Norfolk State University

Geraldine Woodberry-Wright  
*Professor—Biology (P)*  
B.A., Lehigh University  
D.P.M., New York College of Podiatric Medicine

Matthew B. Woods  
*Assistant Professor—Trucking (P)*  
A.A.S., Tidewater Community College

Lisa A. Wrenn  
*Instructor—Biology (V)*  
A.S., Tidewater Community College  
B.S., James Madison University  
M.S., Old Dominion University

Bethany Wright  
*Instructor—Librarian (V)*  
B.A., Brigham Young University  
M.L.I.S., University of South Carolina

David S. Wright  
*Professor—Physics (V)*  
B.S., Brigham Young University  
M.A., Brigham Young University  
Ph.D., Virginia Polytechnic Institute and State University

Joy L. Yaeger  
*Instructor—Librarian (C)*  
A.S., Tidewater Community College  
B.A., Old Dominion University  
M.S., Clarion University

William T. Younger III  
*Assistant Professor—Physics (C)*  
A.S., College of the Albemarle  
B.S., East Carolina University  
M.S., East Carolina University  
Ph.D., ABD, University of North Carolina
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