Effective Fall 2009

DIVISION OF NATURAL SCIENCES AND MATHEMATICS

TIDEWATER COMMUNITY COLLEGE

VIRGINIA BEACH CAMPUS

COURSE PLAN

Course Number and Title MTH 173-Calculus with Analytical Geometry I

Lecture Hours 5 Lab Hours 0 Credit Hours 5

Submitted by: Charlotte Newsom, Robert Maynard Date 7/10/09

Approved by: Charlotte Newsom, Mike Kirby Date 7/14/09
Assistants to the Dean

Gregory P. Frank Date 7/15/09
Academic Dean

Math 173 Calculus with Analytical Geometry I Effective Fall 2009

I. COURSE DESCRIPTION:

A modern, unified course in analytic geometry and calculus including functions, limits, derivatives, differentials, indefinite integrals, definite integrals, and applications.

II. PREREQUISITES:

Math 166 or the sequence Math 163-164 or a satisfactory score on appropriate mathematics proficiency examinations will satisfy the prerequisites.

III. INTRODUCTION:

This course is designed to serve as an introduction to analytic geometry and calculus for students majoring in mathematics, engineering, computer science, and science.

IV. INSTRUCTIONAL MATERIALS:

Textbook: Calculus, Ninth Edition, by Larson and Edwards; Brooks/Cole, Cengage Learning, 2010; ISBN-10:0547167024/ISBN-13:9780547167022
REQUIRED

Graphing or scientific calculator **REQUIRED**

Study and Solutions Guide, Volume I, by Bruce H. Edwards
ISBN-10:0547213093/ISBN-13:9780547213095 **OPTIONAL**

Study and Solutions Guide, Volume II, by Bruce H. Edwards
ISBN-10:0547213107/ISNB-13:9780547213101

V. MATERIAL TO BE COVERED:

Unit I	Chapter 1	2 weeks
Unit II	Chapter 2	2.5 weeks
Unit III	Chapter 3	3 weeks
Unit IV	Chapter 4	2.5 weeks
Unit V	Chapter 5	3 weeks
Unit VI	Sections 7.1-7.4	2 weeks

VI. BASIC CONCEPTS:

Unit I – Limits and Their Properties (Ch 1)

1.1 A preview of calculus
1.2 Finding limits graphically and numerically
Note: Cover the ε-δ definition briefly.
1.3 Evaluating limits analytically
1.4 Continuity and one-sided limits
1.5 Infinite limits

Unit II – Differentiation (Ch 2)

2.1 The derivative and the tangent line problem
2.2 Basic differentiation rules and rates of change
2.3 The product and quotient rules and higher-order derivatives
2.4 The chain rule
2.5 Implicit differentiation
2.6 Related rates

Unit III – Applications of Differentiation (Ch 3)

3.1 Extrema on an interval
3.2 Rolle's Theorem and the mean value theorem
3.3 Increasing and decreasing functions and the first derivative test
3.4 Concavity and the second derivative test
3.5 Limits at infinity
3.6 A summary of curve sketching
3.7 Optimization problems
3.8 Newton's method
Note: Cover Newton's method briefly.
3.9 Differentials

Unit IV – Integration (Ch 4)

4.1 Antiderivatives and indefinite integration
4.2 Area
4.3 Riemann sums and definite integrals
4.4 The fundamental theorem of calculus
4.5 Integration by substitution
4.6 Numerical integration

Unit V – Logarithmic, Exponential and Other Transcendental Functions (Ch 5)

5.1 The natural logarithmic function: differentiation
5.2 The natural logarithmic function: integration
5.3 Inverse functions
5.4 Exponential functions: differentiation and integration
5.5 Bases other than *e* and applications
5.6 Inverse trigonometric functions: differentiation
5.7 Inverse trigonometric functions: integration
5.8 Hyperbolic functions

Unit VI – Applications of Integration (Sections 7.1-7.4 of Ch 7)

7.1 Area of a region between two curves
7.2 Volume: the disc method
7.3 Volume: the shell method
7.4 Arc length and surfaces of revolution

VII. SUGGESTED WEEKLY SCHEDULE – 15 WEEK SEMESTER:

Week 1: 1.1, 1.2, 1.3
Week 2: 1.4, 1.5, Test 1
Week 3: 2.1, 2.2, 2.3
Week 4: 2.4, 2.5, 2.6
Week 5: Test 2, 3.1, 3.2
Week 6: 3.3, 3.4, 3.5
Week 7: 3.6, 3.7, 3.8
Week 8: 3.9, Test 3, 4.1, 4.2
Week 9: 4.3, 4.4, 4.5
Week 10: 4.6, Test 4, 5.1
Week 11: 5.2, 5.3, 5.4
Week 12: 5.5, 5.6
Week 13: 5.7, 5.8, Test 5
Week 14: 7.1, 7.2
Week 15: 7.3, 7.4, Test 6
Final Exam to be given during scheduled exam period.

VIII. SUGGESTED WEEKLY SCHEDULE – 10 WEEK SEMESTER:

Week 1:	1.1, 1.2, 1.3, 1.4
Week 2:	1.5, Test 1, 2.1, 2.2, 2.3
Week 3:	2.4, 2.5, 2.6, Test 2, 3.1
Week 4:	3.2, 3.3, 3.4, 3.5
Week 5:	3.6, 3.7, 3.8, 3.9
Week 6:	Test 3, 4.1, 4.2, 4.3, 4.4
Week 7:	4.5, 4.6, Test 4, 5.1, 5.2
Week 8:	5.3, 5.4, 5.5, 5.6
Week 9:	5.7, 5.8, Test 5, 7.1, 7.2
Week 10:	7.3, 7.4, Test 6, Final Exam

IX. ADDITIONAL MATERIAL AVAILABLE TO STUDENTS:

TCC Student ID required to use these resources.

1. Complete Solution Guide, Available in the Math Lab

2. Calculus, 9E, DVDs, lectures corresponding to the text by section, available in the Learning Resources Center.