

Effective Fall 2011

DIVISION OF NATURAL SCIENCES AND MATHEMATICS

TIDEWATER COMMUNITY COLLEGE

VIRGINIA BEACH CAMPUS

COURSE PLAN

Course Number and Title: MTH 270 – Applied Calculus

Lecture Hours: 3

Lab Hours: 0

Credit Hours: 3

Submitted by: J. Conner, T. Froncillo, C. Hewett, M. Kirby, D. Sinibaldi Date: 6/30/2011

Approved by: M. Kirby and C. Newsom
Assistants to the Dean

Date: 6/30/2011

Academic Dean: G. Frank

Date: 6/30/2011

I. COURSE DESCRIPTION

This course provides an overview of calculus for students in the fields of business, economics, and certain sciences. It covers limits, differentiation, and integration of algebraic, exponential, and logarithmic functions, and introduces the calculus of several variables. It emphasizes the use of these concepts in various application problems.

II. PREREQUISITES

MTH 163 or the appropriate score on the placement test.

III. INTRODUCTION

This course is designed to provide students with the basics in differential and integral calculus as a tool to graph and solve application problems in their fields.

IV. INSTRUCTIONAL MATERIALS

Textbook: Calculus & Its Applications-Tidewater Community College Custom Ed
by Bittenger, Ellenbogen and Surgent; (2011); Addison-Wesley

ISBN: 1-256-13012-5

REQUIRED

Scientific calculator or graphing calculator

REQUIRED

MyMathLab ACCESS CODE

Optional

Students can purchase a MyMathLab access code at www.mymathlab.com and will have access to all of the resources, including the e-book.

NOTE: Students with the e-book through MyMathLab are not required to have a printed book.

V. MATERIAL TO BE COVERED

Unit I	Sections 1-1-1.8	4 weeks
Unit II	Sections 2.1-2.7, 3.1, 3.2, 3.6	4 weeks
Unit III	Sections 4.1-4.6	4 weeks
Unit IV	Sections 5.1, 5.3, 5.4, 6.1, 6.2	3 weeks

VI. BASIC CONCEPTS**Chapter 1: Differentiation**

- 1.1 Limits: A Numerical and Graphical Approach Omit
- 1.2 Algebraic limits and Continuity
- 1.3 Average Rates of Change
- 1.4 Differentiation using Limits of Difference Quotients
- 1.5 Differentiation techniques: The Power and Sum-Difference Rules
- 1.6 Differentiation Techniques: The Product and Quotient Rules
- 1.7 The Chain Rule
- 1.8 Higher-Order Derivatives

Chapter 2: Applications of Differentiation

- 2.1 Using First Derivatives to Find Maximum and Minimum Values and Sketch Graphs
- 2.2 Using Second Derivatives to Maximum and Minimum Values and Sketch Graphs
- 2.3 Graph Sketching: Asymptotes and Rational Functions (omit Slant Asymptotes)
- 2.4 Using Derivatives to Find Absolute Maximum and Minimum
- 2.5 Maximum-Minimum Problems; Business and Economics Applications
- 2.6 Marginals and Differentials (cover lightly)
- 2.7 Implicit Differentiation and Related Rates

Chapter 3: Exponential and Logarithmic Functions

- 3.1 Exponential Functions (cover differentiation only)
- 3.2 Logarithmic Functions (cover differentiation only)
- 3.3 OMIT
- 3.4 OMIT
- 3.5 OMIT
- 3.6 An Economics Application: Elasticity of Demand

Chapter 4: Integration

- 4.1 Antidifferentiation
- 4.2 Antiderivatives as Areas (cover lightly)
- 4.3 Area and the Definite Integral (cover lightly)
- 4.4 Properties of the Definite Integral
- 4.5 Integration Techniques: Integration by Substitution
- 4.6 Integration Techniques: Integration by Parts
- 4.7 OMIT

Chapter 5: Applications of Integration

- 5.1 An Economics Application: Consumer Surplus and producer Surplus
- 5.2 OMIT
- 5.3 Improper Integrals
- 5.4 Probability
- 5.5 OMIT
- 5.6 OMIT
- 5.7 OMIT

Chapter 6: Functions of Several Variables

- 6.1 Functions of Several Variables
- 6.2 Partial Derivatives

VII. SUGGESTED WEEKLY SCHEDULE – 16 WEEK SEMESTER

Week 1: 1.1, 1.2

Week 2: 1.3-1.5

Week 3: 1.6, 1.7

Week 4: 1.8, Test 1

Week 5: 2.1, 2.2

Week 6: 2.3, 2.4

Week 7: 2.5, 2.6

Week 8: 2.7, 3.1, 3.2

Week 9: 3.6, Test 2

Week 10: 4.1-4.4

Week 11: 4.5, 4.6

Week 12: 5.1, Test 3

Week 13: 5.3, 5.4

Week 14: 6.1, 6.2

Week 15: Test 4, review

Week 16: **Final Exam** to be given at the scheduled exam period.

VIII. SUGGESTED WEEKLY SCHEDULE – 10 WEEK SEMESTER

Week 1: 1.1-1.4

Week 2: 1.5-1.7

Week 3: 1.8, TEST 1, 2.1

Week 4: 2.2-2.4

Week 5: 2.5-2.7

Week 6: 3.1, 3.2, 3.6, TEST 2

Week 7: 4.1-4.5

Week 8: 4.6, 5.1, TEST 3

Week 9: 5.3, 5.4, 6.1

Week 10: 6.2, EXAM

IX. ADDITIONAL MATERIAL AVAILABLE TO STUDENTS

TCC Student ID Required to Use these Resources

1. Student's Solutions Manual Available in Math Lab
2. Instructor's Solution Manual Available in Math Lab

MATH 270 RECOMMENDED HOMEWORK

Recommended homework problems are from the *Tenth Edition of Calculus and its Applications*, by Bittinger, Ellenbogen, and Surgent, 2010, Pearson.

Section	Page	Problems
1.1	106	1 – 19, ODD, 23 – 69 EOO, 71, 73
1.2	117	1, 5, 9 – 29 EOO, 31-47 ODD, 51, 55, 59, 65, 69, 73
1.3	128	1 – 21 EOO, 27, 31, 33, 39, 41
1.4	141	1 – 13 EOO, 15, 21, 25, 27, 43 – 49 EOO, 51, 55, 56
1.5	154	1 – 85 EOO, 87, 89, 91, 93, 95
1.6	163	1 – 9 EOO, 11 – 29 ODD, 33 – 37 ODD, 45, 97, 101 – 107 ODD, 111, 113, 119
1.7	173	3 – 43 EOO, 43 - 57 ODD, 61, 67 – 77 ODD, 81, 83
1.8	182	1 – 49 EOO, 55, 57
2.1	212	1 – 33 EOO, 69 – 81 EOO, 87, 89
2.2	231	1 – 9 ODD, 15 – 27 EOO, 35, 39, 41, 45, 47, 51 – 55 ODD, 105, 107
2.3	247	1 – 9 EOO, 11, 13 – 21 ODD, 23 – 35 EOO, 43, 49, 55, 57 – 65 ODD
2.4	258	5 – 35 EOO, 49 – 77 EOO, 97, 99, 103
2.5	273	1, 13, 15, 19, 23, 27 – 33 ODD, 37
2.6	285	1, 5, 7, 9, 17, 19, 27, 31, 35 – 47 ODD, 51, 57, 63, 67
2.7	292	1 – 17 EOO, 19 – 29 ODD, 33 – 39 ODD
3.5	368	1 – 41 EOO, 43
3.6	376	1 – 17 EOO
4.1	396	1 – 57 EOO, 59 – 65 ODD, 69
4.2	407	1 – 9 EOO, 23, 27, 29, 31 – 39 ODD
4.3	421	1 – 7 ODD, 11, 13, 27, 29, 43, 45 – 57 EOO, 59 – 63 ODD, 69, 79
4.4	433	1 – 5 ODD, 11 – 21 ODD, 25 – 33 ODD, 37 – 43 ODD, 49, 51, 55, 59
4.5	443	1 – 57 EOO, 63, 67, 73
4.6	452	1 – 37 EOO, 39, 40, 41, 42
5.1	479	1 – 13 ODD
5.2	489	1 – 13 ODD, 17, 21 – 27 ODD, 31
5.3	496	1 – 29 EOO, 31 – 35 ODD
5.4	506	1 – 9 EOO, 11, 15 – 27 ODD, 31, 35, 37
6.1	554	1 – 17 ODD
6.2	562	1 – 41 EOO, 43