Math 166   Analytic Geometry and Calculus I with Review Part II   **Spring 2006**
M Tu W F   10:20 a. m. – 11:10 p.m. PPHAC 116

Instructor: Alicia Sevilla
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Office hours: M ,W, F 11:10 a. m. — 12.10 p.m., 2—2:30 p.m., and by appointment

Course Description: This is the second course of the sequence Mathematics 106-166. The two courses together include all the topics of a standard calculus I course with extensive precalculus review.

Prerequisite: Math 106.

Course Goals: After successful completion of this course you will be able to:

- find limits and derivatives that involve trigonometric functions
- develop the rules for derivative of inverse trig functions and logarithmic functions
- apply the concept of derivative to solve optimization problems, problems that involve related rates and problems related to economics
- use calculus tools to describe the behavior of functions and their graphs
- find antiderivatives of basic functions
- evaluate definite integrals of basic functions using the Fundamental Theorem of Calculus
- find areas and distances using definite integrals
- use L'Hopital's rule to find limits of indeterminate forms.

Textbooks:

1. James Stewart, *Single Variable Calculus: Early Transcendentals*, fifth edition, or *Calculus: Early Transcendentals*, fifth edition, Brooks/Cole, 2003
2. Ebersole, Schattschneider, Sevilla, Somers, *A Companion to Calculus*, 2nd edition, Brooks/Cole, 2005

Graphing Calculator: You are expected to have a graphing calculator and bring it to class. We recommend the TI-83; instructions will be provided on this calculator.

Course Content: This is Part II of a two-semester course in calculus that includes extensive review of algebra and elementary functions. We will cover sections 3.4, 3.8, 3.10, 3.11, and most of chapters 4 and 5 of *Single Variable Calculus*, and chapters 8, 11, 12, 14, 15, 16, 17, 18, and 20 of *A Companion to Calculus*.
Topics are as follows:

   Angle measures, definition and evaluation of trigonometric functions, properties of trigonometric functions, domain, range and graphs of trigonometric functions, combining functions with trigonometric functions derivatives of trigonometric functions.

One-to-one functions, inverse of a function, finding the inverse, derivatives of inverse trigonometric functions.

Definition and properties of logarithmic functions, graphs of logarithmic functions, solving equations with logarithmic functions, derivatives of logarithmic functions.

Setting up equations for related rates problems, problem-solving strategies for related rates problems, related rates.

Tangent line approximation, the differential, linear approximation.

Extreme and critical values, the Mean Value Theorem, solving inequalities, how derivatives affect the shape of a graph, indeterminate forms and L'Hopital's rule, summary of curve sketching, optimization problems, applications to economics.

Antiderivatives, recognizing antiderivatives, sigma notation for sums. areas and distances, the definite integral, area under a curve as a definite integral, other interpretations of the definite integral, the Fundamental Theorem of Calculus, indefinite integrals, substitution for indefinite integrals.

Assignments: Mathematics can only be understood by consistent study and problem solving. For this reason, daily reading and problem assignments will be given and you are expected to have these assignments completed for the next class. You will be called on to give solutions in class, and also are expected to ask questions about what you did not understand.

Quizzes and Exams: Announced short quizzes will be given frequently. The quizzes will include questions on the reading assignments as well as problems similar to the exercises assigned for homework. There will be three in-class exams, on the following dates:

Friday February 10   **Wednesday March 17**   **Wednesday April 12**

There will also be a (comprehensive) final exam during final exams week.

Grading: Course grade will be based on a total of 600 points as follows: quizzes 100 points, in-class exams 300 points (100 each), final exam 160 points, class participation 40 points.

Attendance: Class attendance is required. You are responsible for all work covered in class and all assignments, even if absent from class. If you must miss more than one class due to illness or emergency, you should notify the instructor. In-class exams must be taken at the announced time; make-up exams will be given only in case of extreme emergency or serious illness. There will be no make-up quizzes.

Help: You are encouraged to see Dr. Sevilla during office hours or to arrange an appointment for extra help when needed. Student tutors will be available for assistance Monday through Thursday evenings every week. (Beginning date and exact hours will be announced in class.) There is no charge for this help. Tutors are not allowed to help with take-home quizzes.

The following **Academic Honesty Policy Guidelines** are to be followed. Please read them carefully.

ACADEMIC HONESTY POLICY GUIDELINES

MATHEMATICS COURSES

The Mathematics and Computer Science Department supports and is governed by the *Academic Honesty Policy of Moravian College* as stated in the Moravian College Student Handbook. The following statements will help clarify the policies of members of the Mathematics faculty.

In all homework assignments which are to be graded, you may use your class notes and any books or library sources. When you use the ideas or thoughts of others, however, you <u>must</u> acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of an individual other than your instructor. If you receive help from anyone other than your instructor or if you fail to reference your sources you will be violating the *Academic Honesty Policy of Moravian College*. For homework that is not to be graded, if you choose, you may work with your fellow students. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and ungraded.

All in-class or take-home tests and quizzes are to be completed by you alone without the aid of books, study sheets, or formula sheets unless specifically allowed by you instructor for a particular test.