

Math 106 Analytic Geometry and Calculus I with Review Part I**Fall 2007**

M, W, F 10:10 a. m. – 11:20 a.m. PPHAC 232

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E-mail: means01@moravian.edu;**Office hours:** M W F, 1:45 p.m. – 2:45 p.m., Tu 3 p.m. – 4 p.m. and by appointment**Course Goals:** In this course you will learn the rudiments of the mathematical language of *change*. In particular you will learn the concepts of limits, continuity and differentiation, and how to work with functions graphically, algebraically and numerically. You will also learn techniques for finding derivatives of algebraic and exponential functions; and how to apply these techniques to solve real world problems. In addition, you will improve your competency with the foundational mathematical tools upon which the Calculus is based.**Textbooks:**

1. James Stewart, *Single Variable Calculus: Early Transcendentals*, sixth edition, Thomson Brooks/Cole, 2008
2. Ebersole, Schattschneider, Sevilla, Somers, *A Companion to Calculus*, second edition, Thomson Brooks/Cole, 2006

Graphing Calculator: You are expected to have a graphing calculator and bring it to class. We recommend the TI-83 or the TI-84; instructions will be provided on these calculators.**Course Content:** This is Part I of a two-semester course in calculus that includes extensive review of algebra and elementary functions. Specific topics to be covered include most sections from Chapters 1—3 in Stewart's text, and Chapters 0—7, 9, 10, and 13 of the Companion.

Topics are as follows:

Symbols and notation, modes of communication.

Coordinate geometry and lines: a Cartesian coordinate plane, graphs, lines and their equations, parallel and intersecting lines, distance between two points, the circle.

Functions and their graphs: function notation, domain and range of a function, different ways of representing functions, the graph of a function, special classes of functions, transformations of graphs.

Limits: tangent and velocity problems, combination of functions, limit of a function, algebraic simplification of functions, calculating limits using limit laws, inequalities, precise definition of limit.

Continuity: Polynomials, zeros of a polynomial, composition of functions, domains of functions.

The role of infinity: graphical interpretation, algebraic manipulations, limits at infinity, horizontal asymptotes, infinite limits, vertical asymptotes.

Rate of change: applications, secant and tangent lines, velocity and other rates of change

Derivatives: negative and rational exponents, the derivative as a function, derivatives of polynomials and of exponential functions, the product and quotient rules, rates of change in the natural and social sciences, the chain rule, simplifying derivatives, implicitly defined functions, implicit differentiation, solving equations for dy/dx , iteration, higher derivatives, rate of change of rate of change**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 class-hour exams, on the following dates:

Friday, September 21

Monday, October 22

Monday, November 19

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 125 points, class participation 75 points.

Attendance and Participation: 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. To get full credit for class participation, you need to be actively involved in the class work, come to class prepared to answer and ask questions on the topics discussed the previous class, and be ready to show solutions of homework problems on the board.

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 may not help with projects or take-home quizzes.

Special Accommodations: Any student who wishes to disclose a disability and request accommodations under the Americans with Disabilities Act (ADA) for this course first **MUST** meet with either Mrs. Laurie Roth in the Office of Learning Services (for learning disabilities and/or ADD/ADHD) or Dr. Ronald Kline in the Counseling Center (for all other disabilities).

Note: *This syllabus is a guideline for the course. It may be necessary to make changes during the semester. I will announce any changes in class.*

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 must 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 which 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 your instructor for a particular test.