

## MATH 150.002: INTRODUCTION TO CALCULUS

### Class Information

Coordinator: Eddie Fuller  
Room: 101 Woodburn  
Time: M,W,F 8:30-9:20  
Semester: Fall 2002

### Instructor Information

Instructor: Krzysztof Chris Ciesielski  
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Office Hours: Tuesday 8:30-9:20, Friday 10:30-11:20 and by appt.

**Text:** Brief Calculus and Its Applications.

**Pre-requisite:** One of the following – 580 Math SAT or 25 Math ACT score, or completion of Math 124, 126 or 129. Please note that Math 150 is **NOT** a prerequisite for Math 155 and that it doesn't satisfy the same credit requirements as Math 155. Math 150 covers both first and second semester calculus and is intended to prepare primarily business and economics majors for their major courses.

**Objectives:** The general goals of the Introduction to Calculus course are:

- **APPLICATIONS:** use math to model and solve real world problems
- **CONCEPTUAL UNDERSTANDING:** explore and understand central concepts in algebra, rather than just rote memorization of algorithms
- **COMPUTATIONAL SKILLS:** develop proficiency in manipulating algebraic expressions and the computation of derivatives and integrals
- **PROBLEM SOLVING:** gain experience as a problem solver, to use a heuristic to analyze problems in an organized manner
- **MULTIPLE APPROACHES:** to examine problems from analytical, geometric and numeric perspectives, to make decisions about the appropriateness of the choice of formal or approximate methods of solution
- **TECHNOLOGY AS A TOOL:** use technology as an integral part of the process of formulation, solution, and communication, to gain experience in selecting the proper tool for a given problem. You can use a graphing calculator (TI-83 or 86), computer algebra system (Derive), or access to the online Grapher Applet. The applet is free and can be found on the course coordinators home page, <http://www.math.wvu.edu/~ef/>.
- **ACTIVE STUDENT LEARNING:** to engage in the exploration and discovery of concepts and to learn to work cooperatively to solve problems
- **COMMUNICATION OF IDEAS:** to demonstrate understanding by explaining in written or oral form the meanings and applications of concepts

The specific goals of this course will be to stress an algebraic, graphic, and numeric approach to the study of:

- the concept of function and using functions as models
- modeling techniques used in solving real world problems
- using the derivative as a tool to solve problems
- using the definite integral and area to solve problems

To accomplish these goals requires active student learning, not passive participation.

**Evaluation:** Multiple forms of assessment will be used to measure your understanding of the concepts, skills, and problem solving. The distribution of these assessments is:

Assessment	Number	Percent of Grade
1. Quizzes and Weekly Problems	~15	20%
2. Attendance/Participation		10%
3. Exams	4	40%
4. Comprehensive Final	1	30%

GRADING SCALE: A 100-90; B 89-80; C 79-70; D 69-60; F 59-0.

*Attendance/Participation:* Attendance will be checked daily. You can have up to three absences with no penalty. Every additional absence will result in losing one percent from the 10% available for the attendance.

*Quizzes and Weekly Problems:* You will be required to take WEBCT quizzes assessing mastery of skills, which are taken outside of class time from any computer connected to the web. You will be allowed to take each quiz up to three times, with the highest score counting as part of your grade. It is also possible that regular, in class, quizzes will be given.

An algebra skills Preassessment that counts as a quiz grade will also be given during the second week of classes. The Preassessment is a measure of the basic manipulation skills you should possess as a foundation for taking Math 150. This assessment will be given once only after about a week of review. Your success in the course depends in part on the manipulation skills you possess. If you do not perform at a predetermined level on the Preassessment, you will be advised to attend a series of tutoring sessions to improve your basic skills. You will also be required to sign a contract saying that you are aware of the recommendations made based on the Preassessment.

The exams will be given in the IML Computer Center on Tuesdays as indicated in the course outline. There will also be an exam time slot provided in the previously scheduled Wednesday evening (5:30-7:30pm) exam time. Exams will be completed and submitted on the computers in this lab. You will need to present your WVU ID on exam days. The final will also be in the Computer Center on Tuesday during finals week and will require a signup for testing times (more on this later).

**HELP:** On an average, you should expect to spend five hours per week outside of class working on this class. If you are spending more, then you may need to seek help! There are several excellent sources for such help. First, seek help from your classmates. Often they can explain the problem clearly since they have been working on it. Second, seek assistance from your instructor. A few questions may clarify the problem. Third, seek help from the Math Learning Center in Armstrong 301. Finally, the IML Computer Center will offer mentoring sessions on Tuesdays from 1 to 4. These sessions will include both computer-based tutorials and human tutors.

West Virginia University is committed to social justice. I concur with that commitment and expect to foster a nurturing learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (293-6700).

## MATH 150 Course Outline

Date	Class/Lab Activity	Read	Assignment
8/19	M Introduction; Functions and Their Graphs	Section 0.1	
8/21	W Some Important Functions; Algebra	Sections 0.2-0.3	
8/23	F Zeroes of Functions; Exponents	Sections 0.4-0.5	
8/26	M Applications of Functions and Graphs	Sections 0.6	
8/28	W The Slope of a Straight Line	Section 1.1	
8/30	F The Slope of a Curve at a Point	Section 1.2	
9/2	M Labor Day (No Classes)		
9/4	W The Derivative	Section 1.3	
9/6	F Review for Exam 1		
9/9	M Limits and the Derivative	Section 1.4	
9/10	T <b>Exam 1 in IML Computer Center</b>		
9/11	W Differentiability and Continuity	Section 1.5	
9/13	F Rules for Differentiation/More Derivatives	Section 1.6, 1.7	
9/16	M The Derivative as a Rate of Change	Section 1.8	
9/18	W Describing Graphs of Functions	Section 2.1	
9/20	F The First and Second Derivative Tests	Section 2.2	
9/23	M Curve Sketching I	Section 2.3	
9/25	W Curve Sketching II	Section 2.4	
9/27	F Review for Exam 2		
9/30	M Optimization I	Section 2.5	
10/1	T <b>Exam 2 in IML Computer Center</b>		
10/2	W Optimization II	Section 2.6	
10/4	F Applications for Business and Economics	Section 2.7	
10/7	M The Product and Quotient Rules	Section 3.1	
10/8	T <b>Mid-Term Grades Assigned</b>		
10/9	W The Chain Rule and General Power Rule	Section 3.2	
10/11	F Implicit Differentiation and Related Rates	Section 3.3	
10/14	M Exponential Functions	Section 4.1	
10/16	W $e^x$	Section 4.2	
10/18	F Differentiation of Exponential Functions	Section 4.3	
10/21	M Review for Exam 3		
10/22	T <b>Exam 3 in IML Computer Center</b>		
10/23	W The Natural Log Function	Section 4.4	
10/25	F The Derivative of $\ln(x)$	Section 4.5	
10/28	M Properties of the Natural Log Function	Section 4.6	
10/30	W Exponential Growth and Decay	Section 5.1	
11/1	F Compound Interest	Section 5.2	
11/4	M Applications of Natural Logs in Economics	Section 5.3	
11/6	W Further Exponential Models	Section 5.4	
11/8	F Review for Exam 4		
11/11	M Antidifferentiation	Section 6.1	
11/12	T <b>Exam 4 in IML Computer Center</b>		
11/13	W Areas and Riemann Sums	Section 6.2	
11/15	F Definite Integrals/Fundamental Theorem	Section 6.3	
11/18	M Areas in the $xy$ -plane	Section 6.4	
11/20	W Applications of the Definite Integral	Section 6.5	
11/22	F Techniques of Integration	Section 6.6	
	<b>Thanksgiving Break</b>		
12/2	M Improper Integrals	Section 6.7	
12/4	W Applications of Calculus in Probability	Section 6.8	
12/6	F Review for Final		

Final: Friday Dec 14 at assigned time in IML Computer Lab