

## Math 108: Functions and Derivatives with Applications, Fall 2014

**Instructor:** Fred Schultheis

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**Office Hours:** MF 12:00 -1:00 pm, W 9:00-10:00, and by appointment

**Required text:** Calculus: For Business, Economics, Life Sciences, and Social Sciences, by Barnett, Ziegler and Byleen, 13th edition

### Course Goals

This course is designed to develop the calculus concepts that will benefit those students interested in the business and social sciences. The approach used will be especially useful for students who need to study calculus but would benefit by a review of necessary precalculus topics. Upon completing the course, successful students will be able to work with functions algebraically, graphically, and numerically, and use them to model problems, understand the derivative conceptually as well as knowing how to calculate derivatives using the various techniques studied in class, improve their communication and technical writing skills by discussing mathematical problems and presenting solutions in written and oral form.

### Course Description

The course meets MWF from 2:35 to 3:45 in PPHAC 233. Homework assignments will be given at each class meeting. Students are expected to complete these assignments by the next class meeting, where they will be discussed. No one can learn mathematics without doing it themselves and so, **to the student, homework is the most important part of the course.** Since class participation is important, students are expected to attend every class. The main content of the course is contained in the first four chapters of the text.

### Grading

Your final grade will be based on weekly quizzes (100 points), class assignments/participation (50 points), 3 hourly exams (100 points each), and a comprehensive final exam (175-200 points). Attendance and effort will be considered when determining class participation. The following grading scale is used when assigning your final grade.

		87 – 89	<i>B+</i>	77 – 79	<i>C+</i>	67 – 69	<i>D+</i>	$\leq 59$	<i>F</i>
93 – 100	<i>A</i>	83 – 86	<i>B</i>	73 – 76	<i>C</i>	63 – 66	<i>D</i>		
90 – 92	<i>A–</i>	80 – 82	<i>B–</i>	70 – 72	<i>C–</i>	60 – 62	<i>D–</i>		

**The final exam is scheduled for Wednesday, December 10, 2014 at 1:30 pm.**

### **Attendance**

Regular attendance is necessary in order to be most successful. Poor attendance will affect a student's class participation grade. You will lose 10% from your class participation grade for each unexcused absence. If you are sleeping in class, you are not there. If you feel the need to leave class before it is over, even if you come back, you are not there. In other words, in any of these cases you will be considered absent and will lose 10% of your class participation grade.

**There will be no make-ups for missed quizzes. Make-up tests are given only in extreme cases. If a student has to miss a test it is the student's responsibility to contact the instructor as early as possible.**

### **Learning Disability Accommodations**

Students who wish to request accommodations in this class for a disability should contact Elaine Mara, assistant director of learning services for academic and disability support at 1307 Main Street, or by calling 610-861-1510. Accommodations cannot be provided until authorization is received from the Academic Support Center.

### **ACADEMIC HONESTY POLICY GUIDELINES FOR 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.

**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.

## Math 108 Tentative Assigned Problems–Fall 2014

### Topic Section Problems

Functions 2-1 Pages 54-57, # 33,35,53-69odd,73,75,91

Elementary Functions:Graphs 2-2 Pages 66-67 # 9-17 odd,29,31-39 odd 43.45

Linear Equations and Inequalities 1-1 Pages 10-11 # 1-9 odd,17,31

Linear Functions and Straight Lines 1-2 Pages 23-24 # 5-15 odd, 27,29,33,

Introduction to Limits 3-1 Pages 138-139 #1-25 odd,39,41,47, 49,55,57

Infinite Infinity and Limits 3-2 Pages 150-151 # 9-25 odd ,31-43 odd

Continuity 3-3 Pages 161-153 #7-31 odd, 35-41 odd

### TEST 1 (Tentatively September 28)

The Derivative 3-4 Pages 175-176 # 3,7,9,11,27,29, 31-39

Basic Differentiation Properties 3-5 Pages 184-186 # 1-17odd, 25-45odd,49,51,53,55,  
81

Marginal Analysis in Business and Economics 3-7 Pages 201-203 # 1,3,5,7,11,13,15,  
17, 19, 27, 29, 33, 35, 37, 43,45

### TEST 2 (Tentatively October 19)

Exponential Functions 2-5 Pages 103-105 # 3,5,15,17,19, 29-37 odd, 43,  
45,47,5

Logarithmic Functions 2-6 Pages 116-117 # 1,3,7,9,13,15, 17 19, 27, 29,  
31,33, 43, 47, 49 83

The Constant e and Continuous Compound Interest 4-1 Pages215–216 #  
1,3,5,7,9,17,19

Derivatives of Exponential and 4-2 Pages224- 225 #1-21odd,27, 28, 29

Derivatives of Products and Quotients 4-3 Pages 231-232 # 1-25 odd, 39,45,73,83

The Chain Rule 4-4 Pages 240-242 # 17-47 odd, 51, 55- 69 odd

Implicit Differentiation 4-5 Page 248-249 #1-11 odd.17,19, 29

Elasticity of Demand 4-7 Pages 260-262 # 1-5, 9, 13, 19, 23, 25,29, 31,35,37

### TEST 3 (Tentatively November 17)

First Derivatives and Graphs 5-1 Pages 278-282 # 11-17 odd, 27, 33, 35,37,  
38, 47, 49, 55, 57,79

Second Derivatives and Graphs 5-2 Pages 296-298 # 1-21 odd, 25, 31-43  
odd, 47, 49, 51, 55-61 odd

L'Hopital's Rule 5-3 Page 309-310 #1-33 odd

Curve Sketching Techniques 5-4 Pages 319-320 # 4, 5, 11, 27, 45, 49, 51

Absolute Maxima and Minima 5-5 Pages 330-331 # 7-17 odd, 21, 25, 33, 37,  
41

Optimization 5-6 Pages 340-343 # 1-13 odd,17,19,21, 23.25

**FINAL EXAM: Wednesday. December 10, 2014 at 1:30 pm.**