MATH 112 Calculus 2
Fall 2009

Meeting Place: FREY 345 10:00 M W F FREY 166 11:55 – 1:10 TH

Instructor: Doug Phillippy
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Office Hours - M W F (9:00-10:00) T Th (8:15-9:30)

Required Course Material: Larson, Hostetler, and Edwards, *Calculus*, 8th Edition, Houghton Mifflen, 2006.

Course Objectives:

1. To acquire a comparative knowledge of standard coordinate systems and the ability to choose the most efficient system for any specific problem.
2. To develop a rigorous understanding of sequences and series with ability to determine their convergence or divergence.
3. To understand applications of the definite integral to problems such as area, volume, arc length, work and centers of mass.
4. To enhance learning by examining geometric, numerical and algebraic aspects of each topic.
5. To acquire an understanding of the breadth of mathematics by studying applications in a wide variety of scientific fields.
6. To use the tools of calculus to formulate and solve multistep problems and to interpret the numerical results.
7. To enhance the ability to communicate mathematical concepts through a series of written laboratory assignments and classroom discussions.
8. To select and use technology when appropriate in problem solving.
9. To develop an ability to recognize calculus concepts in the context of application problems and implement the corresponding processes.
10. To develop the process of making appropriate conjectures, finding suitable means to test those conjectures and drawing conclusions about their validity.

Prerequisites by Topic: MAT 111(Calculus 1) or equivalent

1. Ability to graph functions and identify extrema and asymptotes.
2. Understand the use of Riemann sums in finding areas and volumes
3. Understand and use the fundamental theorem of calculus.
4. Familiarity with the method of substitution for evaluating an integral

Topics:

1. Applications of integration: a) disk method b) shell method c) area between two curves d) arc length and surfaces of revolution e) work f) moments, center of mass and centroids g) fluid pressure
2. Techniques of integration: a) integration by parts b) trig functions and products of trig functions c) partial fraction representation of rational functions.
3. Infinite sequences, arithmetic and geometric, positive terms and limits of sequences.

4. Infinite series, positive term series, alternating series, conditional convergence, absolute convergence, power series, region of convergence, calculus of power series, applications of power series.
5. Polar coordinates and parametric equations: a) study of coordinate system, b) graphing, c) areas and arc lengths.
6. Conic sections: a) representation in both rectangular and polar form, b) graphs with emphasis on applications.

Resources:

1. The mathematics reading room (Frey 341).
2. Student math resource people available Monday through Thursday nights in Frey 341.
3. Messiah College welcomes students with disabilities. **AMERICANS WITH DISABILITIES ACT:** Any student whose disability falls within ADA guidelines should inform the instructor within the first two weeks of any special accommodations or equipment needs necessary to complete the requirements for this course. Students must register documentation with the Office of Disability Services (Hoffman 101). If you have questions, call extension 5382.

During each class, we will discuss material from the text. You should read each section before it is discussed. When this discussion is completed, practice problems will be assigned. Approximately one day each week we will discuss the assigned homework. Following the discussion, there will be a short quiz. In addition, we will meet in the Computer Lab several times throughout the semester. In this lab you will use of a "Computer Algebra System" to investigate the concepts of calculus and to aid you in solving calculus problems (DERIVE or MAPLE). This course will require roughly 2 hours of homework for each class session. Your attendance is expected at all class sessions. Excessive absences will be detrimental to your grade. Exams may be made up only with a valid excuse, and quizzes cannot be made up. The lowest quiz grade will be dropped. Work should be handed in at the beginning of class on the date it is due. Every day that the work is late will result in a 10% reduction of your grade.

Grading:	Hour Exams (4)	400 points
	Quizzes/homework	100 points
	Computer Labs	100 points
	Final Exam	200 points
	TOTAL POSSIBLE	800 points

Grading scale:	Course %	Course Grade
	90%	A
	80%	B
	70%	C
	60%	D

Exceptions to this table: + and - given at instructor's discretion.
Final Exam Date – Tuesday December 15th at 1:30. School policy requires you to take the exam on this date. Make travel plans accordingly.

Prov 3:5-6 Trust in the LORD with all your heart and lean not on your own understanding; in all your ways acknowledge him, and he will make your paths straight.

Sept.	2		Introduction
	3	7.1	3,7,13,15,17,23,25,27,33,39,43,51,61,65,72,73,74
	4	7.2	5,9,13,23,27,29,37,45,49,63ac
	7	7.3	3,5,7,9,13,15,17,21,27ab,33,35
	9	7.4	1,3,7,13,17,37,39,41,43,51
	10		Lab
	11	7.5	3,7,9,15,19,21,25,31,33
	14	7.6	3,7,11,13,21,25,33
	16	7.7	3,7,13,17,19,25
	17		Lab
	18		Chapter 7 Make-up day;
	21	8.2	5,9,11,15,19,25,27,33,53,83,103
	23		Review
	24		TEST 1
	25		
	28	8.3	5,7,9,17,25,27,29,31,33,35,37,39,51,57,65,67
	30	8.4	7,11,15,21,23,27,29,31,37,39,47,51,81
Oct.	1		Lab
	2	8.4	
	5	8.5	6,7,9,11,13,17,19,25,27,29,31,41,53
	7	8.5	
	8		Lab
	9	8.7	1,5,9,13,15,17,19,25,29,31,33,35,37,39,41,43,45,55
	12	8.8	1,3,5,9,11,13,15,19,21,25,27,29,33,35,37,43,45 (Lab 2 Due)
	14		Review
	15		TEST 2
	16		
	19	9.1	5,7,9,11,13,15,17,19,21,25,27,31,33,37,39,45,47,51,53,55,57,59, 67,71,75,77,104,105,107,121
	21	9.1	
	26	9.2	3,7,9,11,15,17,19,21,23,25,29,35,39,41,43,47,51,57,59,61,63
	28	9.3	1,3,5,7,11,15,17,19,21,23,27,27,29,31,33,35,37,39,41,53,79,81,83,85,87,89
	29		Lab
	30	9.4	1,3,5,9,11,13,15,17,19,21,23,29,30,31,32,33,34,35,36
Nov.	2	9.5	1,3,5,11,13,15,17,19,21,23,25,27,29,47,49,51,53,55,57,59
	4	9.5/9.6	
	5		Lab
	6	9.6	1,3,5,7,11,13,15,19,23,25,27,29,31,33,37,39,41,45,47,51,53,55,57,59,61,65
	9	9.7	1,2,3,4,5,11,15,19,21,25,29,39,41,43
	11		Review
	12		TEST 3
	13		
	16	9.8	3,5,11,13,17,21,27,31,35,37,41,45

	18	9.9	1,5,9,11,13,15,21
	19	Lab	
	20	9.10	1,5,7,21,25,31,35,37
	23	10.2	3,7,9,11,15,17,19,21,23,25,29,33,37,51
	24	10.3	3,7,11,13,15,19,21,23,25,27,29,31,33,37,47 (Thursday Schedule)
	30	10.4	1,3,5,7,11,13,15,17,19,23,24,25,26,27,29,31,33,35,37,39
Dec.	2	10.4	43,45,49,51,59,63,65,67,73,75,77,79,81,83,85,87,89
	3	Lab	
	4	10.5	1,3,7,9,13,15,17,21,25,31,35,37,47
	7	10.1	1,3,5,9,13,17,19,23,29,33,45,47,49
	9	Review	
	10	Test 4	
	11		
	15	Final Exam at 1:30	