Moravian College
Math 106
Analytic Geometry and Calculus with Review-Part I
Fall 2015

Instructor: J. Victoria
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Course Goals:

   The students will
- review mathematical concepts and techniques needed to successfully study calculus.
- reinforce their understanding of the meaning of a function.
- work with functions algebraically, numerically and graphically.
- be introduced to the concepts of limits and continuity of functions.
- develop the notion of a derivative as both a rate of change and as the slope of a tangent to a curve.
- learn techniques for finding derivatives of algebraic and exponential functions
- be able to find the derivative of an implicit function
- relate all concepts studied to real world problems
- use the graphing calculator as a tool for visualizing calculus concepts

Course Materials:

Texts: Calculus, Single Variable, 2nd Edition by Jon Rogawski
        A Companion to Calculus, 2nd ed. by Ebersole, Schattschneider, Sevilla, Somers

Calculator: The TI 83+ or TI 84+ calculator is recommended and will be used for presentations, but any comparable graphing calculator with which the student is familiar with is acceptable.

Attendance:

- Regular attendance is necessary in order to be most successful. Poor attendance will affect a student's class participation grade.
- Make-ups for tests and quizzes will be given only for excused absences. An excused absence is one that is okayed by the professor before the test or one for which a medical excuse can be produced.

Academic Honesty:

Please refer to Moravian's "Policy on Academic Honesty" that is outlined in the current Student Handbook.

Specifically, for this class

- you may use any notes, books or library sources for homework assignments (graded or non-graded). You may also work with other students on these assignments, **but, you must indicate those with whom you conferred** as well as be responsible to explain all solutions by yourself.
- all tests , quizzes and the Final Exam are to be completed without the aid of books, notes or formula sheets unless specifically permitted by the instructor.
- graphing calculators will be required as indicated by the instructor for answering questions on assignments, tests and quizzes; however, a complete discussion as to how they were used may be required.

Special Considerations:

Students who wish to request accommodations in this class for a disability must contact Ms. Elaine Mara, assistant director of academic support services for academic and disability support, at the lower level of Monocacy Hall, or by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic Support Center.

Student Expectations:

Students should be spending approximately ten hours per week outside of scheduled class times on assigned reading and exercises, completing graded problem sets and studying for quizzes and tests.

After completing this course, students are expected to be able to

- identify functions and their domains using both algebraic and graphical methods
- find the limits of algebraic functions numerically and algebraically
- be able to discuss limits and continuity of functions in relation to their graphs
- determine horizontal and vertical asymptotes of rational functions
- find the derivative of polynomial, rational, and exponential functions
- be able to use the product and quotient rules for derivatives
- find derivatives using the chain rule
- find the tangent lines to functions at given points using derivatives
- use derivatives to find velocity and acceleration in rectilinear motion problems.
- find average and instantaneous rates of change in various situations
- understand functions implicitly defined and determine their derivatives

Evaluation and Grading:

Practice is vital for developing the required Calculus skills. It is **necessary** that the student does **all** homework exercises assigned.

In addition to the daily assignments (not graded) there will be graded homework assignments approximately every two weeks. **These assignments will be graded with a 20% penalty for each day that they are late.**

The students' grade will be determined on the basis of three exams, four quizzes, six graded homework assignments, class participation, and a cumulative final exam.

The percent breakdown of the Final Grade is as follows[*].

Tests	45%
Quizzes	15%
Graded Homeworks	15%
Final Exam	25%

The Final grade will be based on the following rubric.

Average	Grade	Average	Grade
$x \geq 92$	A	$72 \leq x < 78$	C
$90 \leq x < 92$	A-	$70 \leq x < 72$	C-
$88 \leq x < 90$	B+	$68 \leq x < 70$	D+
$82 \leq x < 88$	B	$62 \leq x < 68$	D
$80 \leq x < 82$	B-	$60 \leq x < 62$	D-
$78 \leq x < 80$	C+	$x < 60$	F

[*]For borderline cases, class participation will help decide the Final Grade. It is important to remember that **class attendance has a definite effect on how I view your class participation.**

	Rogawski	**CTC**	**Daily Assignments (Tentative)**
Real Numbers, Functions and Graphs	**1.1**		**Pg 10-12 # 3,5,7,9,15,37,41-47 odd,**
			53-59 odd
The Cartesian Coordinate Plane		1-A	Pg 13 # 1,3
Graphs		1-B	Pg 18 # 1-3
Distance Between Two Points	1-E		Pg 32 # 1,2
The Circle		1-F	Pg 35 # 4,5
Function Notation		2-A	Pg 44 # 2,4
Interval Notation		2-B	Pg 48 #1,2
The Graph of a Function		2-D	Pg 60 # 3
Linear and Quadratic Functions	**1.2**		**Pg 19-20 # 1-19 odd, 33, 43,51**
Lines and Their Equations		1-C	Pg 25 * 3
Parallel and Intersecting Lines		1-D	Pg 29 # 3, 4
		Exercises	Pg 35-37 # 1,7,13

QUIZ 1

	Rogawski	**CTC**	**Daily Assignments (Tentative)**
The Basic Classes of Functions	**1.3**		**Pg 25 # 1-7 odd, 27, 29**
Transformations of Graphs		2-F	Pg 82 # 1, 4
Combinations of Functions		3-A	
Inverse Functions	**1.5**		**Pg 41-42 # 5, 9, 11**
One-To-One Functions		14A	Pg 359 # 4
Properties of a Function and its Inverse		14B	Pg 366 # 6
Finding the Inverse Function		14C	Pg 376 # 1
Exponential and Logarithmic Functions	**1.6**		**Pg 50 bot-52 #1-27 odd**
Negative and Rational Exponents		7-A	Pg 219-220 # 1
Rules of Exponents		13-A	Pg 343 #3, 5,10
The Natural Exponential Function		13-B	Pg 349--350# 1, 5
Definition and Properties of Logarithmic Function		15-A	Pg 385 # 2
Solving Equations with Logarithms and Exponents		15-C	Pg 396 # 1

TEST 1 (Tentatively September 18)

	Rogawski	CTC	Daily Assignments (Tentative)
Limits, Rates of Change and Tangent Lines	**2.1**		**Pg 64-66 # 1, 7, 11, 15, 25**
Limits: Numerically and Graphically	**2.2**		**Pg 74-76 # 1, 3, 17, 47,49,51,53**
Basic Limit Laws	**2.3**		**Pg 80 # 1-21odd,27,29**
Limits and Continuity	**2.4**		**Pg 88-89 #1,3, 17, 49, 51, 57,63,65, 67, 69, 73,**
75			
Companion to Continuous Functions		CTC	Pg 141 # 3, 4
			Pg 159-160 # 13, 15
QUIZ 2			
Intermediate Value Theorem	**2.8**		**Pg 109 # 1, 9**
Zeros of a Function		4-B	Pg 150 2,5,6,7
Algebraic Simplification of Functions		3-B	Pg 110-111 # 7bc (Simplify)
Evaluating Limits Algebraically	**2.5**		**Pg 94-95 # 1-17 odd, 21,25,37,38,, 45, 49, 51**
Limits at Infinity	**2.7**		**Pg 105 # 1 ,7-19 odd, 23**
Graphical Interpretation		5-A	Page 171-172 # 1 3, 4, 6, 7
Algebraic Manipulations: Horizontal Asymptotes		5-B	Pg 179 # 1-4
Vertical Asymptotes			Pg 183 # 1, 3

TEST 2 (Tentatively October 232)

	Rogawski	CTC	Daily Assignments (Tentative)
Definition of the Derivative	**3.1**		**Pg 125-126 # 3, 6, 19, 27, 29, 33,4 9, 59**
The Derivative as a Function	**3.2**		**Pg 139-142 # 1-35odd, 39, 41, 45, 51, 53, 71, 73**
QUIZ 3			
Product and Quotient Rules	**3.3**		**Pg 147 #1, 3, 7-19 odd, 23, 31, 33, 39, 41, 47**
Rates of Change	**3.4**		**Pg 156-157 # 1-7 odd, 13, 15, 21, 23, 47**
Applications		6-B	Pg 203 # 4,5,6
(JUST PROBLEMS)	**3.1**		**Pg 126 # 33, 35, 39**
Higher Derivatives	**3.5**		**Pg 163 # 1-19 odd, 37, 39**

TEST 3 (Tentatively November 18)

	Rogawski	CTC	Daily Assignments (Tentative)
The Chain Rule	**3.7**		**Pg 174 #9-15 odd, 25, 31, 33, 35, 47**
Simplifying Derivatives		7-C	Pg 227 # 3, 4
Implicitly Defined Functions		9A	Pg 288 # 2ade
Solving Equations containing dy/dx		9B	Pg 291-292 # 1bc, 2bc, 3bc
Implicit Differentiation	**3.10**		**Pg 192 # 9, 17, 19, 31, 39**
	Chapter Review		**Pg 204-205 # 29, 33, 35, 37, 55, 57, 85, 87, 91 ,95,**
	97, 101		

QUIZ 4

FINAL EXAM:
 Thursday, December 14 - 8:30 am