

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

**Instructor** – K. Moser

Office: PPHAC 222

Office Phone: 610-625-7776

Email: moserk@moravian.edu

Office hours: M, W, F 10:15-11:15 am, Other times by appointment

**Course Materials** – *Calculus, Single Variable, 3rd Edition* by Jon Rogawski and Colin Adams  
*A Companion to Calculus, 2nd Edition* 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. Please refrain from using your cell phone or smartphone during class. NOTE: for all tests and quizzes electronic devices (cell phones, smartphones, laptops, iPads, etc.) must be away and are NOT permitted to be used.

**Course Goals** – Each student 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.

**Class Participation and Attendance** – Regular and active class attendance and participation is expected of all students and necessary in order to be most successful. You are responsible for all material assigned or covered in class. If you do miss a class for any reason, it is your responsibility to keep on track and up to date with class topics. You should see a classmate or the instructor for notes, homework assignments, and any announcements from class. Attendance will be taken during each class meeting.

Behaviors that will negatively affect your class participation grade:

- poor attendance (including absences, lates, and leaving during class)
- using cell phones or other devices during instructional time

Behaviors that will positively affect your class participation grade:

- coming to class, and being on time!
- asking questions
- answering questions
- actively working on any in-class assignments

**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. All given assignments are designed to give students opportunities to practice using all of the concepts presented in class. Final grades will be determined on the basis of class participation, seven graded homework assignments, four Blackboard assignments, 34 mini-quizzes, four tests and a cumulative final exam.

Final grades will be computed based on the weights below\*.

- Class Participation (5%)
- Graded Homework (10%)
- Blackboard Assignments (10%)
- Mini-Quizzes (10%)
- Tests (45%)
- Cumulative final exam (20%)

Final grades will be based on the following rubric.

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

**Homework** – Working together: When faced with difficulty in mathematics, it helps to work through problem with a colleague. I welcome and encourage you to work with friends, tutors and myself in working through completing homework assignments. When you work through the problems connected with each reading, you are welcome and encouraged to work with your friends and classmates. Feel free to exchange ideas as your work through the problems. **HOWEVER:** when writing your homework response, you must work on your own. The final response you write on your homework should be yours and yours alone. I recommend that while you may complete the scratch work for all of your homework with a classmate, you should write the final copy of your homework when you are alone. Ultimately, **YOU** are responsible for understanding how to find a solution to each assigned problem.

It is necessary that students do 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 10% penalty for each day that they are late and will only be accepted up to one week late.**

**Blackboard** – Go to Blackboard.moravian.edu and under the Course tab, do a Course Search for Calculus with Review. There is just one course page for both sections B and C. Enroll in this course. Please do this as soon as possible. Course information will be located on our Blackboard course site. A copy of the syllabus, calendar for the course and other helpful materials will be posted there. Use any of these materials as needed.

There will be 4 assignments given via Blackboard. These are located on our course site in the “Assignments” section. One of these will be due before each test and before the final exam. Each will be a review of material for the corresponding test. Promptly at midnight (the night before the test) the assignment will become unavailable. No make ups will be allowed. Each assignment will become available at least one week before the test. You will have the ability to complete each assignment as many times as you wish before the deadline in an attempt to improve your score. Your highest score will be kept.

**Mini-Quizzes** – On each non-test day there will be a mini-quiz on the homework assignment from the previous lesson day. These will be given at the beginning of the class session. **There will be absolutely NO makeups.** If you come to class late, you will not get extra time to complete the mini-quiz. Also, if you are extremely late and miss the mini-quiz, you may not make it up. There will be a total of 38 of these mini-quizzes. The best 34 scores will be counted (the lowest 4 scores will be dropped).

**Tests** – We will have three in class tests. If you will miss an test (with an approved excuse), you must notify me **PRIOR TO** the test. You will then be given a suitable (corresponding to the time beyond the test date) but more difficult test. Extenuating circumstances will be taken into account (with appropriate documentation).

**Final Exams** – The final exam will be cumulative. Please mark when your final exam is on your calendar and plan accordingly. Final exams are scheduled as follows:

- 106B: Monday, December 14 - 8:30 am
- 106C: Wednesday, December 16 - 1:30 pm

**Disclaimers** – This syllabus is subject to change through the semester. Any updates to the syllabus will be announced in class. The instructor reserves the right to apply qualitative judgment in determining final grades for the course.

**Learning Disability Accommodations** – 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.

**Mathematics Department Academic Honesty Policy** – The Mathematics 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 Department faculty.

In all at-home 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. You also may not use a solution manual** or the help (orally or in written form) of any 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. **You may work with your fellow students on homework which is not to be graded. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and un-graded.**

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

Math 106 Course Outline Fall 2015

<b>Topic</b>	<b>Rog.</b>	<b>CTC</b>	<b>Daily Assignments (Tentative)</b>
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
Real Numbers, Functions and Graphs	1.1		Pg 9 # 3,5,7,9,15,37,41-47 odd, 53-59 odd
Lines and Their Equations		1-C	Pg 25 # 3
Parallel and Intersecting Lines		1-D	Pg 29 # 3, 4
Linear and Quadratic Functions	1.2		Pg 18 # 1-19 odd, 35, 45, 53
The Basic Classes of Functions	1.3		Pg 22 # 1-7 odd, 27, 29
Transformations of Graphs		2-F	Pg 82 # 1, 4
Combinations of Functions		3-A	Pg 96 # 3, 4, 5
Inverse Functions	1.5		Pg 38 # 5, 9, 11
One-To-One Functions		14-A	Pg 359 # 4
Properties of a Function and its Inverse		14-B	Pg 366 # 6
Finding the Inverse Function		14-C	Pg 376 # 1
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
Def. and Prop. of Logarithmic Functions		15-A	Pg 385 # 2
Solving Eq with Logs and Exponents		15-C	Pg 396 # 1
Exponential and Logarithmic Functions	1.6		Pg 47 #1-27 odd
TEST 1			(Tentatively September 25)
Limits, ROC and Tangent Lines	2.1		Pg 60 # 1, 7, 11, 15, 25
Limits: Numerically and Graphically	2.2		Pg 70 # 1, 3, 17, 49, 51, 53, 55
Basic Limit Laws	2.3		Pg 74 # 1-21 odd, 27, 29
Companion to Continuous Functions		CTC	Pg 141 # 3, 4 ; Pg 159-160 # 13, 15
Limits and Continuity	2.4		Pg 82 #1, 3, 17, 49, 51, 57, 63, 65, 67, 69, 73, 75
Intermediate Value Theorem	2.8		Pg 102 # 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 88 # 1-17 odd, 21, 25, 37, 38, 45, 49, 51
Graphical Interpretation		5-A	Page 171-172 # 1 3, 4, 6, 7
Horizontal Asymptotes		5-B	Pg 179 # 1-4
Vertical Asymptotes			Pg 183 # 1, 3
Limits at Infinity	2.7		Pg 98 # 1 ,7-19 odd, 23
TEST 2			(Tentatively October 28)

<b>Topic</b>	<b>Rog.</b>	<b>CTC</b>	<b>Daily Assignments (Tentative)</b>
Definition of the Derivative	3.1		Pg 118 # 3, 6, 21, 29, 31, 35, 51, 61
The Derivative as a Function	3.2		Pg 132 # 1-35 odd, 39, 41, 45, 51, 53, 71, 73
Product and Quotient Rules	3.3		Pg 139 #1, 3, 7-19 odd, 23, 31, 33, 39, 41, 47
Rates of Change	3.4		Pg 148 # 1-7 odd, 13, 15, 21, 23, 47
Applications		6-B	Pg 203 # 4,5,6
(JUST PROBLEMS)	3.1		Pg 118 # 33, 35, 39
Higher Derivatives	3.5		Pg 154 # 1-19 odd, 37, 39
TEST 3			(Tentatively November 23)
The Chain Rule	3.7		Pg 164 #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 with $dy/dx$		9B	Pg 291-292 # 1bc, 2bc, 3bc
Implicit Differentiation	3.8		Pg 172 # 9, 17, 19, 53, 61
Chapter Review	CR		Pg 204-205 # 29, 33, 35, 37, 55, 57, 85, 87, 91, 95, 97, 101
FINAL EXAM:			106B: Monday, December 14 - 8:30 am 106C: Wednesday, December 16 - 1:30 pm