Math 170 Calculus 1
Fall 2006

Instructor: N. Wetcher
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        Office Hours: M, W ,F   8:40-9:10 am
                      T   8:00 am-9:00am
                                  or by appointment

Course Goals:

The students will

- review mathematical concepts and techniques needed to successfully

- review the concept of a function and recall the basic functions.

- work with functions algebraically, numerically and graphically.

- be introduced to the concepts of limits and continuity of functions.
- develop the concept of a derivative as both a rate of change and as the slope of a tangent to a curve.
- master techniques for finding derivatives of algebraic,trigonometric, exponential and logarithmic functions.
- Be able to apply the tools of differential calculus to study and solve problems involving tangent lines and rates of change.

- use the graphing calculator as a tool for visualizing calculus concepts and to gain a sense of both the advantages and disadvantages of using technology while studying the behavior of functions.

- be introduced to the integral and use the Fundamental Theorem of Calculus to evaluate them.

- apply the integral to problems involving areas and distances.

Course Materials:
    Texts: Calculus, 5E (Early Transcendentals Single Variable) by Stewart
    Calculator: The TI 83+ 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. Attendance will be taken and will be used when deciding borderline grades. Students are expected to attend every class and to be punctual. *Students are responsible for all announcements made in class.* If a student <u>must</u> miss class it is their responsibility to find out from me or from another student the homework that was assigned as well as any important information and/or announcements.

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 any homework assignment (graded or non-graded). You may also work with other students on these assignments, <u>but</u>, you must indicate those with whom you conferred as well as be responsible for explaining all solutions by yourself.
- all tests and quizzes are to be completed by you alone, 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 <u>how</u> they were used may be required.

Evaluation and Grading:

Practice is vital for developing the required Calculus skills. Students are expected to spend *6-8 hours per week* outside of class working on the homework problems and readings assigned. Some of the homework problems will be graded while the rest could be checked for completion.

The student will be evaluated on the basis of three labs*, two proficiency tests**, two major tests, best four (out of five) quizzes, graded homework assignments and a cumulative final exam.

There will be a 20% penalty for each day that a graded assignment is late.

There will be no make-ups for missed quizzes.

Make-up tests are given only in <u>pre-approved</u> cases. It is the student's responsibility to contact me **before** the test is administered.

Attendance, class participation and effort will be used to decide borderline grades.

The percent breakdown of the Final Grade is as follows.

Labs	15%
Proficiency Tests	15%
Quizzes and Graded Homework	15%
Tests	30%
Final Exam	25%

The Final Grade will be computed according to the following guideline.

AVERAGE	GRADE
92-100%	A
90-91%	A-
88-89%	B+
82-87%	B
80-81%	B-
78-79%	C+
72-77%	C
70-71%	C-
68-69%	D+
62-67%	D
60-61%	D-
0-59%	F

* Lab Projects: There will be two parts to these projects. You will be expected to work in a small group for the in-class experimental part of the lab and to work alone on the reflective written part.

**Proficiency Tests: There will be two or these to assure your competency in finding limits and and derivatives *without the use of calculators.* You must pass both of these tests with a score of 80% in order to complete the course. You will have more opportunities to take retests but any score higher than 80% on a retest will be scaled down to an 80%.

Math 170-Tentative Homework--Fall 2006

•<u>Hand in solutions of Boldly printed problems within two class meetings</u>.•

Topics	Reading	Problems
Representing Functions	1.1	22-23 # 1,9.15.19,21,23,25,29,31,33,41
Coordinate Geometry and Lines	APP B	A15-16 # 21,25,41
Essential Functions	1.2	35-36 # 1,5,9,11 , **12**
Trigonometry	APP D	A32-33 # 1,9,17,23,29,31,35,59,61,65,69
New Functions From Old Functions	1.3	45-47 # 1,3,9,11,35,41,47,55
Graphing Calculator	1.4	54 # 5,7,9
Exponential Functions	1.5	62 # 7,13,15,17, **18**, 25
Inverse Functions and Logarithms	1.6	74-77 # 3-11odd,23,25,27,35, **36,**39,49 ,**50**,63,65,71
The Tangent and Velocity Problem	2.1	91-92 # 1,3,5
The Limit of a Function	2.2	102 # 1-9 odd,13,15,21,23,25,27
Calculating Limits	2.3	111-113 # 1,11-29 odd,35,39,41,45, **46**
Limits at Infinity	2.6	146-147 # 1-7odd,15-33odd,37-41odd

Limit Proficiency Test (tentatively September 25)

The Precise Definition of a Limit	2.4	122-123 # 1,3,5,15-21odd, **6**,22
Continuity	2.5	133-134 # 5,7,9,15,17,21,23,43,47\
Tangents, Velocities and Rates of Change	2.7	155-156 # 1,3,7,11,17,19
Derivatives	2.8	163 # 3,5,7,13,19,21,25
Derivative as a Function	2.9	173 #1,5,9,23,25,37

Test 1 (Tentatively October 4)

Derivatives:Polynomials and Exponential Fcns	3.1	191-192 # 3-39odd,39,41,45,47, 50or 52
Product and Quotient Rules	3.2	197-198 # 3-19odd,23,25,31,35
Rates of Change:Applications	3.3	208 # 1,3,7,9,13
Derivatives of Trigonometric Functions	3.4	216-217 #1,3,5,9,11,13,15,21,29,31,33
The Chain Rule	3.5	224-225 # 7,9,13,19,23,27-35odd,43,51,53,55

Implicit Differentiation	3.6	233-235 # 1,5-17odd,25,27,41,43,55, 56or 64(a)
Higher Derivatives	3.7	240-241 # 5-19odd,25,29,33,35,43,47
Derivatives of Logarithmic Functions	3.8	249 # 3-13odd, 21,25,31,35-45odd
Related Rates	3.10	260-261 # 3-19odd,23,25, (three from 12,16,18,24)

Derivative Proficiency Test (tentatively October 27)

Linear Approximations and Differentials	3.11	267-268 # 5,7,15,17,21,23,27,31
Maximum and Minimum Values	4.1	286-288 # 3-11odd, 15,17,29,47-61odd,75
The Mean Value Theorem	4.2	295 # 1.3.9.11,13,17
Derivatives and Shape of Graphs	4.3	304-305 # 1,5,7,11,15,17,21,23,27,33, 36,45
Indeterminate Forms and L'Hopitals Rule	4.4	313-314 #1,3,5,9,11,15,17,21,23,27,31,37,49,51,57
Summary of Curve Sketching	4.5	323 # 5,9, 10,13,17,19,20,21,23,27,41,43,45
Optimization Problems	4.7	336-337 # 5,7,9,10*, 11,15,22*,29
Applications to Business and Economics	4.8	346-347 # 3,5,11,13,15,21,22*

*These problems can all be handed in on the day of Test 2

Test 2 (Tentatively November 17)

Antiderivatives	4.10	358-360 #1,7,9,11,13,17,19,23,25,27,31,33,35,37,59,61,65
Areas and DIstances	5.1	378-379 # 3,5,11,15,17,19
The Definite Integral	5.2	390-392 # 1,9,15,17,19,29,33-41odd,47,49,55, 56
The Fundamental Theorem of Calculus	5.3	402-03 # 5-13 odd,19-35odd,53, 54, 55
Indefinite Integrals and the Net Change Theorem	5.4	411-412 # 5-13odd,17-35odd. 53,55
The Substitution Rule	5.5	420-421 31-33odd,51-65odd

Final Examination (Date TBA)