**CALCULUS 1 - 11135 - MA 161 - 01** **WINTER** 2017

**MEETING DAYS:** M W R F **MEETING TIMES:** 12:00 – 12:50 p.m. **ROOM:** Thomas 310

**PROFESSOR:** Dr. TRUONG, Bao **OFFICE**: Jamrich 2216 **PHONE**: 227-1610 **EMAIL**: btruong@nmu.edu

**OFFICE HOURS:** MWRF 4 – 6:00 pm, or by appointment.

**PREREQUISITES**: At least a C – in MA 115 or satisfactory score on the Math Placement Exam.

**TEXT:** *Single Variable Calculus, Early Transcendentals*, by James Stewart.

**COURSE CONTENT**: Calculus is the crowning achievement of 17th century mathematics. It provides, fundamentally, solutions to two problems: the development of a fruitful concept of the slope of a curve at a point on the curve and the development of a fruitful concept of the area bounded by a curve. In this semester, we will concentrate on differential calculus.

1. Functions
2. Limits
   - The idea of limits and techniques for computing limits
   - Infinite limits and limits at infinity
   - Continuity
3. Derivative
   - The idea of derivative
   - Finding derivatives of functions given by table, by graph, and by formula
   - Derivatives of the fundamental functions
   - Derivatives of sums, products and compositions of functions
   - Selected applications of the derivative: optimization, rate of change, and linear approximation.
4. Integral
   - The idea of the definite integral
   - Finding the definite integral of functions given by table, by graph and by formula
   - The Fundamental Theorem of Calculus
   - Selected applications of definite integral: area under a curve and total change from rate of change.

This course satisfies the Foundation of Natural sciences/Mathematics requirement. Students who complete this course should be able to demonstrate a basic understanding of mathematical logic; use mathematics to solve scientific or mathematical problems in college classes; express relationships in the symbolic language of mathematics; and appreciate the role of mathematics in analyzing natural phenomena.

**LEARNING OBJECTIVES**: By the end of the course students will be able to:

- **recognize** properties of functions and their inverses;
- **recall and use** properties of polynomials, rational functions, exponential, logarithmic, trigonometric and inverse-trigonometric functions;
- **find** domain and range of functions;
- **sketch** graphs, using function, its first derivative, and the second derivative;
- **use** the algebra of limits, and l'Hôpital's rule to determine limits of simple expressions;
- **apply** the procedures of differentiation accurately, including implicit and logarithmic differentiation;
- **apply** the differentiation procedures to solve related rates and extreme value problems;
- **obtain** the linear approximations of functions and to approximate the values of functions;
- **perform** accurately definite and indefinite integration;
- **calculate** the area between two curves.
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**ATTENDANCE**: Students must take the responsibility of telling the instructor in advance if they must leave early and must discuss with the instructor immediately after class if they entered the classroom after class has begun. It is the student's responsibility to make sure the attendance record is correct.

**HOMEWORK**: There will be weekly homework assignments on WeBWork. WeBWork problems are computational in nature and assess the techniques introduced in class. Many of these problems will resemble examples in the textbook or from class. You will get immediate feedback on your progress and will get several chances to ensure it. Students should check the course webpage at https://educat.nmu.edu/ for homework and reading assignments. Students are expected to complete all homework and reading assignments in a timely fashion.

**TESTS**: There will be four major tests during the semester. Each test will count 15% toward the final grade. If a test is missed for ANY reason, a grade of 0 will be given. There will be absolutely NO makeup tests given for ANY reason. The lowest of the four test grades will be dropped at the end of the semester. Any person who must miss a scheduled exam because of an official University function must reschedule and take this exam at a time BEFORE the exam is scheduled to be given. NO OTHER rescheduling will be allowed.

**TENTATIVE TEST DATES**

Test 1: Wednesday, February 1
Test 2: Wednesday, February 22
Test 3: Wednesday, March 29
Test 4: Wednesday, April 19
Final Exam: Monday, May 1, 12-1:50 p.m.

**QUIZZES & GROUP WORKS**: There will be a quiz or a group work every Friday.

**GRADES**: Weighted percentage:

| | | | |
|---|---|---|---|
| **WeBWork** | 15% | **Tests** | 45% |
| **Quizzes** | 15% | **Attendance** | 5% |
| | | **Final** | 20% |

Grading scale (approximate)

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|---|---|---|---|---|---|
| A | 93% up | A – | 90 – 92.9% | | |
| B + | 87 – 89.9% | B | 83 – 86.9% | B – | 80 – 82.9% |
| C + | 77 – 79.9% | C | 73 – 76.9% | C – | 70 – 72.9% |
| D + | 67 – 69.9% | D | 60 – 66.9% | F | below 60% |

The grading may be less stringent, but not more stringent, than this.

**TUTORING**: If you need extra help in the class, you are welcome to come to my office hours, or email me to make an appointment to meet with me outside of my office hours. You are also welcome to go to the Mathematics Tutor Lab, West Science 3810. Mathematics Tutor Lab is open M-R 9:00 am.- 4:00 pm and F 9:00 am.- 3:00 pm.

**LAPTOP**: The use of laptop and other electronic devices, except for hand held calculators, will not be permitted during exams. Calculators are allowed on exams in this course; however, you are not permitted to use powerful calculators to perform symbolic differentiation on exams. In general almost all work in this course will be work that a calculator will not help you with, so I think you will find that you only rarely, if ever, need to reach for your calculator.

**ADA STATEMENT**: If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Dean of Students Office at 2101 C. B. Hedgcock Building (227-1700 or disserv@nmu.edu). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.

**FURTHER NOTES**: Bring your text, calculator, and notebook. I urge you to work together in groups.