

SYLLABUS FOR MA 161, CALCULUS 1

Prof. Hal Martin

e-mail: hmartin@nmu.edu

Office Number: 3011 New Science Facility (NSF 3011)

Office Phone: 906-227-1591

Office Hours: 8:30 – 8:50 A.M., Monday through Thursday;
1:00 – 1:50 P.M., Monday through Friday,
and by appointment.

Text: *Calculus* by James Stewart, fifth edition.

Prerequisite: The ideas taught in Math 115. These include the concept of a real-valued function of a single real variable, and the algebraic properties of particular types of such functions such as logarithmic functions, exponential functions, the circular functions and their inverses, as well as rational algebraic functions. [The *elementary functions* are these functions just listed together with all functions that can be created out of these functions through algebraic combinations and compositions]. One should know how to graph these functions, without the aid of a graphing calculator, and have an understanding of how to combine given functions by algebraic operations and by functional composition.

Course Description: Calculus is the mathematics of change. If the variable y is functionally dependent upon the variable x , for example $y = \sin(x^2)$, then we will want to know how the value of y changes when we make a small change in x . The answer lies in the idea of the *derivative* of a function. Derivatives are used to compute velocities and accelerations of moving objects, and in geometry derivatives are used to compute tangent lines to curves and tangent planes to surfaces. After an abstract study of the idea of the derivative, we will learn how to compute the derivatives of the elementary functions and also learn how to apply the derivative to solving certain practical problems. The inverse of the operation of finding the derivative of a function is called *integration*. The integration of functions allows one to compute areas and volumes. Integration is also used to find velocities and positions of moving particles. The two fundamental operations of calculus are the derivative and the integral. The three main features of MA 161, then, are as follows:

- .1). The abstract study of the operations of the derivative and the integral.
- .2). Methods for computing the derivatives and integrals of the elementary functions.
- .3). Applications: using derivatives and integrals to solve practical problems.

Course Outline:

Week 1: Chapter 1

Monday 01/14/08 Sections 1.1 and 1.2.

Tuesday 01/15/08 Sections 1.3 and 1.5.

Wednesday 01/16/08 Section 1.6.

Thursday 01/17/08 Review.

Friday 01/18/08 Exam 1, Sections 1.1 – 1.3, 1.5, 1.6.

Week 2: Chapter 2, Sections 2.1 – 2.3.

Monday 01/21/08 Section 2.1.
Tuesday 01/22/08 Section 2.2.
Wednesday 01/23/08 Section 2.3.
Thursday 01/24/08 Review.
Friday 01/25/08 Exam 2, Sections 2.1 – 2.3.

Week 3: Chapter 2, Sections 2.4 – 2.6.

Monday 01/28/08 Section 2.4.
Tuesday 01/29/08 Section 2.5.
Wednesday 01/30/08 Section 2.6.
Thursday 01/31/08 Review.
Friday 02/01/08 Exam 3, Sections 2.4 – 2.6.

Week 4: Chapter 2, Sections 2.7 – 2.9.

Monday 02/04/08 Section 2.7.
Tuesday 02/05/08 Section 2.8.
Wednesday 02/06/08 Section 2.9.
Thursday 02/07/08 Review.
Friday 02/08/08 Exam 4, Sections 2.7 – 2.9.

Week 5: Chapter 3, Sections 3.1 – 3.3.

Monday 02/11/08 Section 3.1.
Tuesday 02/12/08 Section 3.2.
Wednesday 02/13/08 Section 3.3.
Thursday 02/14/08 Review.
Friday 02/15/08 Exam 5, Sections 3.1 – 3.3.

Week 6: Chapter 3, Sections 3.4 – 3.7.

Monday 02/18/08 Section 3.4.
Tuesday 02/19/08 Section 3.5.
Wednesday 02/20/08 Section 3.6.
Thursday 02/21/08 Section 3.7 and Review.
Friday 02/22/08 Exam 6, Sections 3.4 – 3.7.

Week 7: Chapter 3, Sections 3.8 – 3.9.

Monday 02/25/08 Section 3.8.
Tuesday 02/26/08 Section 3.9.
Wednesday 02/27/08 Review.
Thursday 02/28/08 Exam 7, Sections 3.8 – 3.9.
Friday 02/29/08 No Class.

Semester Break

Week 8: Chapter 3, Sections 3.10 – 3.11.

Monday 03/10/08 Section 3.10.
Tuesday 03/11/08 Section 3.10
Wednesday 03/12/08 Section 3.11.
Thursday 03/13/08 Section 3.11.
Friday 03/14/08 Exam 8, Sections 3.10 – 3.11.

Week 9: Chapter 4, Sections 4.1 – 4.3.

Monday 03/17/08 Section 4.1.
Tuesday 03/18/08 Section 4.2.
Wednesday 03/19/08 Section 4.3.
Thursday 03/20/08 Exam 9, Sections 4.1 – 4.3.
Friday 03/21/08 No Class.

Week 10: Chapter 4, Sections 4.4, 4.5, 4.7, and 4.10.

Monday 03/24/08 Section 4.4.
Tuesday 03/25/08 Section 4.5.
Wednesday 03/26/08 Section 4.7.
Thursday 03/27/08 Section 4.10 and Review.
Friday 03/28/08 Exam 10, Sections 4.4, 4.5, and 4.7.

Week 11: Appendix E and Chapter 5, Section 5.1.

Monday 03/31/08 Appendix E
Tuesday 04/01/08 Appendix E
Wednesday 04/02/08 Section 5.1.
Thursday 04/03/08 Section 5.1.
Friday 04/04/08 Exam 11, Appendix E and Section 5.1.

Week 12: Chapter 5, Section 5.2.

Monday 04/07/08 Section 5.2.
Tuesday 04/08/08 Section 5.2.
Wednesday 04/09/08 Section 5.2.
Thursday 04/10/08 Section 5.2.
Friday 04/11/08 Exam 12, Sections 5.1 and 5.2.

Week 13: Chapter 5, Sections 5.3 – 5.5.

Monday 04/14/08 Section 5.3.
Tuesday 04/15/08 Section 5.4.
Wednesday 04/16/08 Section 5.5.
Thursday 04/17/08 Review.
Friday 04/18/08 Exam 13, Sections 5.3 – 5.5.

Week 14: Chapter 5, Section 5.5, Chapter 6, Sections 6.1, Review.

Monday 04/21/08 Section 5.5.

Tuesday 04/22/08 Section 6.1.

Wednesday 04/23/08 Review.

Thursday 04/24/08 Review.

Friday 04/25/08 Review.

Final Exam Week THURSDAY, MAY 1 2:00 P.M. - 3:50 P.M.

Grading:

The final exam counts as 40% of the course grade. The lowest of the thirteen hourly exam scores will be dropped. Each of the other hour long chapter exams counts as 5% of the course grade.

The usual grading scheme will be followed: 93 – 100 is an A; 90 – 92 an A-; 87 – 89 is a B+; 83 – 86 a B; 80 – 82 a B-; 77 – 79 a C+; 73 – 76 a C; 70 – 72 a C-; 67 – 69 a D+; 63 – 66 a D; 60 – 62 a D-; less than 60, an F. This scheme of grading is a minimum guarantee. Normally some kind of a curve is applied so that in practice the grading is a little more liberal than indicated above.

Attendance Policy:

You have a responsibility to show up. I frequently take attendance, and poor attendance can adversely effect your grade. (Missing more than three classes without good cause is poor attendance). **Make-up exams are given only under extreme circumstances.**

Laptop Policy:

The use of laptops and other electronic devices, except for hand held calculators, will not be permitted during exams. When you are in class, I expect your undivided attention. Therefore, the use of laptops during class periods is not permitted.

Note:

This course satisfies the Foundation of Natural Science/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 probability and statistics in analyzing natural phenomena.

Disability Services:

If you have a need for disability related accommodations or services, please inform the Coordinator of Disability Services Office by: coming into the office at 2001 C.B. Hedgcock; calling 227-1700; or e-mailing 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.