MA141, section 6 – Calculus II **Spring 2016**
TTh 12:30 p.m.–1:45 p.m. and Th 2:00 p.m.–2:50 p.m. (W-1-44)

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Course Description

Math 141 (Calculus 2) is the second course in the sequence of calculus courses for science and math majors. The focus is on understanding mathematical concepts and techniques, and on applying this knowledge into other fields. The two main areas of focus are on techniques of integration, and sequences and series. We will also look at applications of integration to geometric problems, parametric curves, and polar coordinates.

Prerequisites

Admission to the course is contingent upon a grade of C- or better in Math 140 (Calculus I) or an equivalent course.

Text

There is one required text for the course: *APEX Calculus*, by Gregory Hartman, version 3.0. You may download the book in PDF form, free of charge, from the course web page (see below), or from `http://www.apexcalculus.com/`. Inexpensive bound hardcopies are available from Amazon; if you wish to obtain one please search for "APEX Calculus" and be sure to get version 3.0. (Please note that while we will make use of all three volumes, the majority of the course is taken from Volume 2.)

Grading

Course grades are based on weekly quizzes (20%), two in-class tests (22.5% each), and a cumulative final exam (35%).

Reading and class preparation

There is a reading assignment associated with each class period. Although it is not generally possible to discuss every topic in class, students are responsible for the entire content of the reading assignment. *Test and exam questions may cover reading material not discussed explicitly in class.* Consequently it is very

important to complete the reading assignments on time and to come to class prepared with questions.

Make-up tests

Tests may be rescheduled only in cases of serious illness, bereavement, or other circumstances of similar gravity. Whenever possible, arrangements for make-up tests must be made *in advance* of the regularly scheduled testing time.

Accomodations for students with disabilities

Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, CC-UL-211, (617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of the Drop/Add period.

Student conduct

Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct as delineated in the catalog of Undergraduate Programs, pp. 44–45 and 48–52. The Code is available online at the following web site:

`http://cdn.umb.edu/images/life_on_campus/Code_of_Conduct_5-14-14.pdf`

Web page

This syllabus and other course materials are available on-line at

`http://cartan.math.umb.edu/wiki/index.php/Math_141,_Spring_2016`

Course Calendar

Homework problems should be done prior to the due date but ***are not to be handed in.*** *One problem from each assignment will appear on the weekly quiz.*

Tuesday, January 26: Introduction.

Thursday, January 28: Review: antiderivatives; inverse trigonometric functions and their derivatives.

Read before class: Sections 2.7 and 5.1.

Tuesday, February 2: Review: integration by substitution.

Read before class: Section 6.1.

Do before class: Assignment 1.

Thursday, February 4: Integration by parts.

Read before class: Section 6.2.

Tuesday, February 9: Trigonometric integrals.

Read before class: Section 6.3.

Do before class: Assignment 2.

Thursday, February 11: Trigonometric substitution.

Read before class: Section 6.4.

Tuesday, February 16: Integration of rational functions by partial fractions.

Read before class: Section 6.5.

Do before class: Assignment 3.

Thursday, February 18: More on partial fractions.

Tuesday, February 23: Strategies for integration.

Do before class: Assignment 4.

Thursday, February 25: L'Hospital's rule.

Read before class: Section 6.7.

Tuesday, March 1: Improper integrals.

Read before class: Section 6.8.

Do before class: Assignment 5.

Thursday, March 3: Review of Riemann sums; arc length.

Read before class: Section 7.4.

Tuesday, March 8: Exam 1 (sections 2.7, 5.1, 6.1, 6.2, 6.3, 6.4, 6.5, and 6.7; assignments 1–5).

Do before class: Assignment 6

Thursday, March 10: Surface area; introduction to parametric curves.

Read before class: Section 9.2.

Tuesday, March 22: Calculus of parametric curves.

Read before class: Section 9.3.

Do before class: Assignment 7.

Thursday, March 24: Polar coordinates; areas of polar regions.

Read before class: Sections 9.4 and 9.5.

Tuesday, March 29: Sequences.

Read before class: Section 8.1.

Do before class: Assignment 8.

Thursday, March 31: Infinite series.

Read before class: Section 8.2.

Tuesday, April 5: The integral test for convergence.

Read before class: Section 8.3.

Do before class: Assignment 9.

Thursday, April 7: The comparison tests.

Tuesday, April 12: Exam 2 (sections 6.8, 7.4, 9.2, 9.3, 9.4, 9.5, 8.1, and 8.2; assignments 6–9).

Do before class: Assignment 10.

Thursday, April 14: The ratio and root tests.

Read before class: Section 8.4.

Tuesday, April 19: Alternating series and absolute convergence.

Read before class: Section 8.5.

Do before class: Assignment 11.

Thursday, April 21: Strategy for testing convergence.

Tuesday, April 26: Power series.

Read before class: Section 8.6.

Do before class: Assignment 12.

Thursday, April 28: Taylor polynomials.

Read before class: Section 8.7.

Tuesday, May 3: Taylor series.

Read before class: Section 8.8.

Do before class: Assignment 13.

Thursday, May 5: Epilogue: logarithms and the beginning of modern computation.

Tuesday, May 10: Review.

Do before class: Assignment 14.