
Math 14 Calculus with Elementary Functions 1

Jan term 2007

Professor: Adam Lucas
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Prerequisites A B- or better in Math 13.

Course Credit and Schedule. One Saint Mary's College unit
Sec 1: MWF 9:00-11:30

Text: *Thomas' Calculus* by Weir, Hass & Giordano, 11th ed. (ISBN 0-321-18558-7) and Mckeague, *Intermediate Algebra*, 7th ed. Brooks/Cole (ISBN 0534418252)

Course Description: We continue the study of differential calculus (derivatives) and its applications as we add trigonometric functions and their properties to our body of knowledge. Then we begin the study of integral calculus (integration/anti-differentiation). We also explore the topic of mathematical induction. At the end of this course, you should understand and be able to communicate the ideas of calculus in a variety of ways; symbolically, graphically, verbally, and through tables and other forms of numerical data. The variety of the different approaches contributes to the richness and beauty of calculus, but also requires some effort to put all the pieces together.

Math 14 completes the two-course sequence you began in Math 13, and fulfills the College's Area B mathematics requirement. Together, these two courses are equivalent to Math 27: Calculus I, so after taking this course, you may enroll in Math 28 or Math 38: Calculus II. Indeed, the main reason we offer Math 14 during January Term is to allow you to catch up with your colleagues who took Math 27 in the Fall.

Homework:

Problems will be assigned at the end of each class. It is important for your success in the course that you attempt to do those problems before the following class meeting. The struggle to solve them prepares you for the following class. Late homework will not be accepted for any reason.

You may discuss the homework by forming a group and studying with your peers. If you need help please come to my office or go to Sichel 105, the Academic Support and Achievement Program, and ask for a tutor. Act fast and do not fall behind.

You will be allowed to make corrections on your homework in class only in **blue** ink. Hence it is important that at home, you do your homework in pencil or black ink. The work in blue ink is for your own notes and won't effect your hw grade.

Attendance:

Attendance is required and roll will be taken at the *beginning* of each hour. If you are not in your seat when roll is taken, you may be considered absent, so be on time. You are allowed to miss **one** class without affecting your grade. After your grade is dropped one step (A- to B+, C+ to C, etc.) for each successive miss. SMC athletes are excused to attend team commitments but are responsible for notifying me ahead of time (see below).

Exams:

There will be three midterm examinations and a final exam. Suppose a student receives the following grades.

First Midterm	B
Second Midterm	C
Third Midterm	B-
Final Exam	C+, C+
Homework Grade	A-

Then the lowest of the Midterm/Final Exam grades above is dropped. If you miss a midterm exam that is the grade you drop. The final grade for the course is the average of the remaining five grades, in this example a B-. The Homework Grade cannot be dropped.

Exam Dates:**Midterm exams:**

Monday, January 15 classtime 1 hour exam

Monday, January 22 classtime 1 hour exam

Monday, January 29 classtime 1 hour exam

Final exam:

Friday February 2, classtime 2 hour exam

Schedule of Topics

- 1/8** Mathematical induction and introduction to trigonometry.
- 1/9** More trig and the derivative of trig functions
- 1/11** Intermediate Value Theorem, Extreme Value Theorem and applications.
- 1/12** Advanced graphing using the first and second derivatives.
- 1/15** **Test 1** and more advanced graphing.
- 1/16** holiday
- 1/18** Word problems (optimization and modeling).
- 1/19** more word problems
- 1/22** **Test 2**, applications of the derivative to physics
- 1/23** Sigma notation and Riemann sums, the integral
- 1/25** Second fundamental theorem of Calculus.
- 1/26** Review
- 1/29** **Test 3**, Mean-Value theorem
- 1/30** Mean-value theorem continued, review
- 2/1** Review
- 2/2** **Final exam**