Syllabus: Math 162 Section 2  
Calculus with Applications II  
Fall 2007: CRN 42271

**Instructor:** Dr. Wayne Aitken.  Office: SCI2 327.  Phone: 750-4155  
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Web Page: http://public.csusm.edu/aitken_html/

**Meeting Place and Time:**

- MW  Markstein Hall  11:00 – 11:50 AM  
- F  SCI 2 306  10:00 – 11:50 AM

**Office Hours:**

- M  4 - 5 PM  
- W  1 - 2 PM  
- F  by appointment 12 - 1 PM

**Prerequisites:** MATH 160 (or equivalent) with a grade of C or better. You should know differential calculus, trigonometry, college level algebra, and the basics of integration.

**Required text:**

Single Variable Calculus: Early Transcendentals  
by James Stewart  
ISBN: 0534393306  
Hardcover: 936 pages  
Publisher: Brooks Cole (5th edition 2002)

**Course Description:** This course covers  (1) integration (beyond the basics),  (2) parametric curves, (3) infinite series, and  (4) (as time allows) simple differential equations. It will cover these topics in such a way that you will be given opportunities to use material that you have learned in earlier courses including differential calculus, trigonometry, and algebra. You will not only learn new mathematical tools, but will learn how to apply them to solve problems in other disciplines. Although not the central concern of this class, you will be exposed to mathematical software both as a computational aid and as a means to illustrate and generate examples. Finally I will try to humanize calculus (and the sciences) by discussing the history of mathematics. You should learn to think of mathematics as a dynamic field of inquiry and not as a static piece of knowledge.

You will be expected to demonstrate mastery of the material in tests, quizzes, and assignments. There are two aspects of demonstrating mastery: (i) demonstrating basic knowledge, and (ii) using this knowledge to solve problems.  

In an effort to aid in the first aspect, I will provide one to three “set pieces” each week that you are expected to learn inside and out. These set pieces will consist of certain basic examples that illustrate the key ideas of calculus. Since everyone is expected to know these set pieces throughly, they will provide a common culture and resource for us to build on. Although you will be expected to go significantly beyond the set pieces, they will by themselves give a good illustration of what calculus is used for. If you ever feel lost in this course, the set pieces will give you something to grab onto and help you get your bearings. In addition to the set pieces, I will recommend a certain number of routine exercises for you to do to help you build up your confidence and competence. Finally, there will problems in your homework and quizzes, and even a few on the tests, that will require that you develop and use problem solving skills. These are problems that might seem unfamiliar to you at first, but should, after some thought, be solvable using the mathematical tools you have learned. They might seem more difficult simply because they require several mathematical tools in sequence, even drawing on mathematical tools from earlier courses.
Some of your assignments will involve you giving a written description (in full English sentences) of the solution to a problem. This is partly to satisfy the writing across the curriculum requirement at CSUSM, but also to provide you with practice in describing mathematics and the use of mathematics in solving problems. By being required to describe a solution and articulate it in ordinary language, the mathematics will become more natural and less “fuzzy” to you. Many mistakes or misconceptions become clear when you carefully explain your thinking. Because of this you are encouraged to explain your solutions, whenever possible, to other students. For example, when you come to office hours because you are stuck on how to solve a problem, I will ask you to explain carefully and clearly the part of the problem that you can do.

Finally, although not the main emphasis of the course, you will learn the reasons why some of the mathematical tools work. In other words, you will learn (and be tested on) some of the theory behind the mathematical tools including some proofs.

Learning Objectives:

1. Gain proficiency in key concepts of calculus and the ability to apply these concepts to solve scientific problems.

2. Practice using concepts and techniques from earlier courses.

3. Practice writing mathematical prose.

4. Understanding the reasons why the concepts and techniques of calculus were developed and why they work, including understanding some proofs.

Key dates:

Aug 24  (Friday) First day of class
Sep 3   (Monday) Labor Day - no class
Sep 6   (Thursday) End of add/drop period (and Open University registration)
Nov 12  (Monday) Veteran's Day - no class, campus closed
Nov 23  (Friday) Thanksgiving Holiday (campus closed Nov 22 - 25)
Dec 7   (Friday) Last day of class
Dec 12  (Wednesday) Final Exam 11:30-1:30 in Markstein Hall 208
Dec 14  (Friday) Official end of semester
Dec 20  (Thursday) Grades due from instructors
         (Grades available on SMART System on Jan 11)

Grading: Grading will be based on four unit grades and participation. The fourth unit will culminate in the final exam. The final exam will be partly comprehensive.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Unit 1 including Midterm Exam 1</td>
<td>23%</td>
</tr>
<tr>
<td>Unit 2 including Midterm Exam 2</td>
<td>20%</td>
</tr>
<tr>
<td>Unit 3 including Midterm Exam 3</td>
<td>23%</td>
</tr>
<tr>
<td>Final Unit including the Final Exam</td>
<td>28%</td>
</tr>
<tr>
<td>Participation</td>
<td>6%</td>
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Each unit will end in an exam. The score in each unit will be based largely on the exam score (at least 75% of the total), but an important part (up to 25% of the total) will be based on quizzes and other assignments. On Friday we will have a one or two part quiz (often split up with other activities interspersed). They will cover recent set pieces, as well as other topics. I will advise you on the Wednesday before the quizzes what to study for the Friday quizzes. Finally I may give other assignments that you will turn in for a grade.

Minimal Standards: Any student who scores less than 50% on any of the first two exams cannot pass the course. Such students will not be allowed to take further exams, and will be advised to drop the course.
**Class Participation:** 6% of your grade will be based on class participation. To do well in this category you will need to attend regularly (typically with no more than two absences) and attentively, show a willingness to answer questions and occasionally ask helpful questions, actively participate in in-class activities, and help to maintain a positive classroom experience. Also you will be expected to follow basic classroom etiquette and rules including *not using the computer during class except as part of a classroom activity*, and failure to do so will result in a lower participation score. Behavior that interferes with or distracts from other student's learning will also lead to a lower participation score. Finally, students needing extra help with a topic may be asked to make appointments to consult with me, and part of the class participation score will be based on participation in such consultations.

**Make-Up Work:** There will be no make-up work. I will drop the two lowest quiz or assignment scores *in each unit*, so if you miss a quiz it does not hurt your grade: you simply drop that score as part of your grade. In the case of a legitimate, documented absence for an exam, the weight of that exam will be transferred to the final exam. Similar arrangements will be made for legitimate, documented absences that affect the completion of two or more quizzes and assignments in a given unit.

**Web Page:** I will maintain a web page for this course. It will contain supplementary materials such as lists of assignments, recommended problems, some solutions, extra notes, listings of special office hours, and whatever cool stuff I can think of. Before each test I will post a study guide or a sample test. The web address is

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www.csusm.edu/public/aitken_html/m162/
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**Math Lab:** The Math Lab (Library 1103) is a useful resource for study help.

**Use of Calculators:** When calculators are allowed on a test or quiz, you should use only non-graphing, non-programmable calculators (or get instructor approval). Cell phones cannot be used during tests and quizzes. If calculators are not allowed on a test or quiz, the calculations involved will be elementary. I will often warn you in advance about which special values of trig functions or other relevant computation aids you should know for such a test or quiz.

**Academic Honesty:** You will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. For assignments, you are encouraged to discuss your ideas with classmates, but make sure that the work you turn in is your own. Students are not allowed to help each other during examinations, nor are they allowed to use any non-approved aides or devices (including cell-phones, calculators, or iPods). If you believe there has been a violation of these guidelines by someone in the class, please bring it to my attention. I reserve the right to discipline any student for academic dishonesty, in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades or the assignment of a failing grade for an exam, assignment, or the class as a whole. Incidents of academic dishonesty will also be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.

**ADA Policy:** Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet me during office hours in order to ensure confidentiality.
Outline of the course:

This is a tentative outline: some aspects may change as the course progresses. Tests dates are approximate, but most or all the tests will be on a Wednesday. So make sure not to plan schedule conflicts on Wednesdays. We will typically cover three sections per week.

Unit 1: Review of Chapter 5, all of Chapter 6, and Sections 7.1 - 7.2.
Test: 19th of September (Wednesday)

Unit 2: Sections 7.3 - 7.8, 8.1 - 8.2.
Test: 10th of October (Wednesday)

Unit 3: Sections 8.3, 10.1 - 10.4, 11.1 - 11.5.
Test: 7th of November (Wednesday)

Unit 4: Sections 11.6 - 11.11, differential equations, and comprehension review
Test: 12th of December (Wednesday)