This is a 4 unit-course, covering inequalities, functions, graphs, limits, continuity, derivatives, antiderivatives, the definite integral and applications. You will be introduced to the computer algebra system Mathematica. Elementary geometry, intermediate algebra, and trig, or Math 6 (precalculus) are prerequisites. You must also meet the ELM requirement. Math 75 satisfies the G.E. Foundation B4 requirement.

**Instructor**

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**Math Department Office**

ROOM: Peters Bldg, Room 381
PHONE: 278 - 2992
HOURS: 8-12 & 1-5 daily

Office Hours: MON & WED: 10 - 11:30 and TUES & FRI: 10:30-11:30 or by arrangement (I am usually available at other times.)
(I have classes Mon & Wed: noon-2 & 3:30-4:45 and Tues & Fri: noon-2.)

TEXT

*Calculus, Fifth Edition,* by James Stewart (Chapter 1 through Chapter 6)

You will also use this text for Math 76 and Math 77.

In addition: You are responsible for learning a set of basic "competencies" in Mathematica each semester of calculus, basically on your own. Mathematica is a very sophisticated computer algebra system that will do algebra and calculus. It is like working with a cross between a programmable calculator and a computer language. I will spend 2 or 3 classes directly on Mathematica, depending on time constraints, but I will use it on some handouts and in class. Mathematica is used in all four semesters of calculus and many upper division math courses. The entire Mathematica text (about 3 inches thick) is available onscreen in *Mathematica,* along with Help on most topics. I also have written numerous examples for Math 75-77 that you will have access to.

You do not have to purchase any additional material for the Mathematica. You can download MathReader from www.wolfram.com for free or from the Math Department website. It allows you to view, copy and paste, and print Mathematica documents, but you cannot make changes or run them. You must purchase the actual Mathematica software package in order to create your own programs. You can buy a student version of the software at the bookstore (better prices I hear) or www.wolfram.com. The website also shows a semester version and a one-year version. You must provide proof of student status and jump through several hoops to get the student price. (I could not find the price list on the site!)

There is a copy of *A Mathematica Mystery Tour,* by Sean Cleary and Larry Cusick, a short guide to the basics of Mathematica, with my other Mathematica materials. It has examples from arithmetic, algebra, trig and calculus, done with Mathematica.

The previous edition of the text came bundled with a Mathematica book covering Math 75 and Math 76 topics. I don't know what you got with this edition. You can also buy it from the same website or order it through the bookstore. Math 77 has a different book.

**Sources of Help-Besides My Office Hours**

**Related to the Text** (Also see preface, pages xxiv-xxv):

1. **Student Solutions Manual (For Single Variable)** - worked out solutions to odd numbered problems for Math 75-76. Check the Book Store, the text's website, Amazon.com, or BarnesandNoble.com. I URGE you to buy it so that you can see how to write out solutions to problems and to check you work.

2. **Study Guide** (I don't know how useful it is.)
3. **WEBSITE FOR THE TEXT:** www.stewartcalculus.com. Resources by chapter, including tutorials, graphing calculators, TI tutorials. There are also links to other resources, coordinated with the chapters.

4. The **CD's that come with the text.** I haven't checked them out yet.

5. The **CALCULUS RESOURCE CENTER** available on Blackboard (blackboard.csufresno.edu). One of our faculty members wrote short discussions with slides to match the topics in the text. Log in and look under Organizations. I lack the software to see the talking head that explains the slides. I can hear it, but not see it.

6. There are some links on the **Math department website,** under **Other.**

7. **WWW.HOTMATH.ORG** has step-by-step hints and detailed solutions with reasons to the actual odd-numbered problems from Chapters 1 - 14 but it costs $29 per semester. #15, #25, & #35 in each set are free. Also solutions to problems from texts for algebra, etc.

8. Use a search engine. Try something like Calculus tutorial or Algebra tutorial.

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**ON CAMPUS (THIS MAY CHANGE BECAUSE OF BUDGET CUTBACKS):**

1. **DEPARTMENT WALK-IN LAB** - Free, drop in lab, run by the Mathematics Department in EE 167. One person is available to tutor students from almost any lower division math class. Schedule should be available soon.

2. **WALK-IN LAB** - Free, drop-in lab available to all students in lower division math, but primarily for courses below calculus level. Contact the Learning Resource Center in the temporary buildings west of the Peters Building. Phone: 278-3052.

3. **TUTORIAL SERVICES** - Free, small-group tutoring for one hour per week. Contact the Learning Resource Center.

4. **PRIVATE TUTORS** - a list is available in the Math Department office; prices vary with the individual tutor.

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**I. HOMEWORK ASSIGNMENTS**

I really believe you should do as many problems as possible, to succeed in calculus!

There is a good chance that we will lose grader funds because of the state's budget mess. I simply do not have time this semester to grade 95+ papers plus homework for both sections of calculus and my upper division math class. I will either drop or drastically reduce homework and alter the grading policy if the money disappears.

- I give a set of **Practice Problems** (mostly odd-numbered exercises from the text) for each section, many with hints. I do not collect these problems. The Student Solutions Manual has semi-detailed solutions. I strongly suggest that you do as many problems as you can in each section on your own and make use of any outside help that you can get. My homework and test questions will look a lot like these exercises.

- I collect homework about once a week. Some assignments will be longer than others, but typically no more than ten or twelve problems. Points for each assignment vary, sometimes greatly. I usually try to give two or three problems from each section of the text.

- **Homework will count the same as an exam grade.** However, you are allowed to drop one grade. It could be the homework grade.

- If you are absent from class, it is your responsibility to check on announcements and handouts given while you were absent.

- There will be one or two sets of **bonus** homework problems. Their points will be added to your homework total.

- Your **HOMEWORK GRADE** will be based on a maximum of 125 points:
  - To compute your homework grade:
    - Total the number of points earned on all HW assignments
    - Compute the fraction:
      \[
      \frac{\text{Sum of points you earn on homework}}{\text{Total number of points possible on homework}}
      \]
    - Multiply by 125 to get your homework grade
    - I usually divide your point total by some number that is smaller than the points possible. This compensates for missing an assignment or getting a low grade or two.

  - **No late papers** will be accepted. If it is late, you get 0 points on it.
II. EXAMS
- There will be three exams, worth 125 points each.
- Exams will be in class, closed book, no notes and no calculators. I have never allowed "cheat sheets" which contain formulas on my exams.
- For Exam 2 and Exam 3, for sure, part of the exam will be take-home, so that you can use calculators and computers and the text.
- I usually include bonus questions on each exam. Your actual test scores can exceed 125 points.
- I write long exams, but the questions are very similar to problems and examples from the text and class, and homework.
- Since the final exam is multiple-choice, I may include a few multiple choice questions on the exams, but the vast majority of each exam will require worked out answers to questions.

TENTATIVE DATES FOR THE EXAMS:
Exams: Exam 1: Friday, September 24  (Section 1.1 - Section 3.3)
         Exam 2: Friday, October 29   (Section 3.4 - Section 4.5)
         Exam 3: Friday, December 3    (Section 4.7 - Section 6.5)

- No makeup exams. If you miss an exam without telling me, you get a 0 for it.
If you talk to me ahead of time, we can make arrangements for you to take the exam at a mutually convenient time.

III. FINAL EXAM
- Worth 100 points
- The Department gives a common final for Math 75. It consists of 25 multiple-choice questions (4 points each). There is no partial credit.
- The exam must count for at least 20% of your grade (Department policy).
- The final exam is comprehensive.
- It is closed book, with no notes and no calculator.
- The current math 75 instructors will write the exam.
- There are copies of previous finals on the Math Department website, under Other.

- Date of the final exam:
  Tentatively, Wednesday, December 15, 8pm-10pm, unless the rooms are unavailable. The other choice was Thursday, December 16, 8pm-10pm. (It must be given at one of these times - University policy) We are waiting for room confirmations before setting the actual date.

IV. BONUS POINTS for your grade (Mathematica)
- I will use Mathematica and do some demos when we are in EE182.
- If there is time, I will spend 2 or 3 class periods over the semester in the lab letting you try out Mathematica.
- Bonus labs for Mathematica
  - There will be 6 or 7 "lab" assignments, covering different topics
  - Worth approximately 5 to 25 points each
  - You can receive a maximum of 40 points total from these labs.
  - These points will be added to the points for your grade
  - The first two or three "labs" may be due about mid-semester with the rest due at the end of the semester.
  - The reason these are bonus points and not required for your grade, is that you must spend time on your own, learning Mathematica.

YOUR GRADE
1. Take your three exam scores and your homework score. Drop the lowest score, and add the remaining scores together (max of 375 points)
2. Add on your score from the final exam (max of 100 points)
3. Add the bonus points from Mathematica. (max of 40 points)

I grade on a percentage basis, not on a curve:

<table>
<thead>
<tr>
<th>FOR A GRADE OF</th>
<th>YOU NEED</th>
<th>PERCENTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:</td>
<td>427 - 475 points</td>
<td>89.9 - 100</td>
</tr>
<tr>
<td>B:</td>
<td>380 - 426 points</td>
<td>80.0 -</td>
</tr>
<tr>
<td>C:</td>
<td>332 - 379 points</td>
<td>69.9 -</td>
</tr>
<tr>
<td>D:</td>
<td>285 - 331 points</td>
<td>60.0 -</td>
</tr>
</tbody>
</table>
If you are slightly below a **cutoff point** (within 3 or 4 points of the next higher grade), I might raise your grade. I look at things like: attendance, turning in homework, coming to office hours, pattern of grades, etc.

These policies are subject to change in the event of extenuating circumstances. I will inform you in writing of any changes, and if at all possible, any changes would be made only after discussion with the class.

If you are absent from class, it is your responsibility to check on announcements made while you were absent.

**OTHER INFORMATION**

Details are available at the University website and in the Catalog.

**INCOMPLETE GRADE:** Do not ask for an incomplete if you are flunking. I will not give it. You must have completed 2/3 of the work with a passing grade and have a justifiable reason for the request in order to obtain an INC grade.

**DROP A CLASS:** The last day to drop a class easily is **FRIDAY, SEPTEMBER 3.** Use Telephone/Web system. From then through **TUESDAY, NOVEMBER 16,** you can drop a class only for a "serious and compelling reason." I have to sign the drop card and so does the Dean of the College of Natural Science and Mathematics. After that, your only option is to withdraw completely from the University. If you drop by **MONDAY, SEPTEMBER 20,** the W will not appear on your record. [See pages 10 and 14, Schedule of Courses for details.]

If you do not formally withdraw from a class, the instructor must give you a failing grade for it (either an F or a WU, which is the same as an F).

The Dean’s Office has warned that it will require documentation of your reason for dropping and will hold strictly to the University definition of “serious and compelling” reasons.

**ADMINISTRATIVE DROP:** If this class is closed and others want in, I can drop you from the class without your permission if you miss any class session during the first week and fail to notify me personally before the next class meeting. [See page 14, Schedule of Courses.] I will use the policy to drop students starting with Wednesday’s classes.

**ADMINISTRATIVE ADD:** Currently both of my sections are over-full. As long as there is room in other sections, I will not add anyone at all. If someone drops a class, the first person to get through the telephone/web process gets the opening, regardless of whether you are on a waiting list or not. I have no control over who adds. The last day to add without permission is **Friday, September 3.** I can add people after that through **Monday, September 20** using permission numbers.

**My policy for using Administrative ADDS:** (1) the other sections must be full at the beginning of the second week of courses **AND** (2) the person must have attended every session of my class during the first week **AND** (3) I will not go above 40 students. You must receive a permission number from me, and use the web to add. I will wait until the middle of the second week to add any students if the class is still full.

**ATTENDANCE:** I assume you are adults who can decide when you can afford to miss a class session. However, I believe you learn the material better if you are exposed to it several times, both in class and outside class whether working by yourself, in group study sessions, on the web, or with something like Mathematica or calculators/computers. I will not penalize you for missing class, unlike many of the Math 75 instructors. However, I will not conduct personal tutoring for sessions you miss simply because you decided to cut class. However, I **will be taking attendance the first week because the class is full.** I will administratively drop students who miss class.
POLICY ON CHEATING AND DISRUPTIVE BEHAVIOR: The University policies on disruptive behavior and cheating will be followed in this class. At a minimum, if I suspect cheating, all students involved will receive a 0 for the exam. University policy allows giving an F for the course or expulsion from the university.

STUDENTS WITH DISABILITIES: The University policy for students with disabilities will be followed. Contact the Services for Disabled Students Office in the Madden Library Room 1049 (278-2811) for details if you feel you qualify.

SAFETY: If you need to call security on campus, be careful. Campus 911 is not the same as 911 for Fresno in general. If you use a campus phone (located in every classroom), dial 911, or 8-2132. If you use a cell phone, call 278-2132. The emergency phones with the blue lights connect directly to security.

CELL PHONES: Please turn off your phones during class. They are very disruptive.

WORDS OF WISDOM.

"Math is not a spectator sport."

Calculus is a whole level higher than algebra in complexity and reasoning. Problems are more complex, and almost always require at least one algebra concept, and sometimes several concepts. Don’t be surprised if you have trouble understanding a concept the first few times you encounter it. Ask for help if you have tried and still cannot seem to understand the material. The problems will not go away if you ignore them.

If you have forgotten most of the details you learned in algebra, you will have serious trouble in this class. You may want to consider taking Math 6, Precalculus, first, or try getting into our Just-In-Time Math 75. You do some basic trig this semester. You use it more extensively in the next two semesters. You also need some geometry. You need to know: how to solve various types of equations and inequalities (linear, quadratic, absolute value, factorable polynomials, trig); the shapes of basic graphs (Section 1.2); basic graphing ideas or how to use a graphing calculator; function notation; how to work with functions (Section 1.3); working with exponents and radicals; the equations for line, circle and parabola, both how to use them and how to write the equations given information; distance formulas; formulas for perimeter, area, and volume for basic shapes like triangles, rectangles, circles, parallelograms, spheres, rectangular solids, cones, cylinders; concepts for lines, like parallel and perpendicular lines; basic trig functions, their values, graphs, and basic identities. Some of these topics are reviewed in the Appendices. All of them occur as parts of problems, very often as the first steps in a problem.

Learning mathematics is like learning a foreign language or learning to play a musical instrument. If you don’t practice, you will never be very good. The more you practice the more fluent you become. Of course, not everyone will become an expert, but without practice, you won’t even be able to do the simpler things. Also, you can’t wait until the last minute to begin practicing and expect to give a virtuoso performance. You can do many things strictly from memory, but memorizing a lot of examples will not bring complete success. There will be a considerable amount of material to memorize, but the more times you use the concepts the more natural they will become.

You need to practice by doing problems. They help you learn the vocabulary and the techniques that are best for each different concept. It is not enough to know definitions. I will ask you to find answers, not what a word means. Work out the details of problems on paper. Find ways to organize the steps to get to a solution. You have to get your hands dirty. Very few people can learn and understand mathematics just by reading descriptions or by listening to someone describe the steps. Practice also lets you build up some speed in solving. It should not take you hours to do a problem that is just a variation on one that is in the text, or in class, or on homework.

Also look at pages 58-63 in the text. The 4 principles of Problem Solving are adapted from the work of George Polya. Example 1 is similar to many beginning steps of word problems in Chapters 3 and 4. Example 2 is a messy inequality problem. Example 3 uses mathematical induction, which we will use a few times during the semester.

At the college level, you should expect to spend at least 3 hours outside of class for every hour you spend in class. The more often you look at material, sometimes, the
easier it becomes. Cramming for an exam may get you a passing grade, but Math 75 is cumulative. You use the material from earlier chapters in the later chapters. You use Math 75 concepts in Math 76 along with trig, algebra, and some geometry, but mostly, you are learning new material. In Math 77, you will be expected to remember everything you learned in the first two semesters of calculus, along with the other math courses. Those of you in the sciences and engineering will be using the methods of Math 75, 76 and 77 throughout your careers, both in college and out. Those of you in Math will use the techniques as well as some of the more abstract concepts in your math courses and in your later work.

Calculus courses are very time-intensive. We have 58 lectures to cover 6 chapters of material, plus time for exams, review, and questions. There is very little time in class to review topics like solving equations or inequalities, or solving a right triangle. You need to work outside of class. If you do not keep up and do not put the time in, you are almost guaranteed to fail the course.

Ideally, you should read through a section before I lecture on it. Pay attention to the terms and symbols that are used and any material that is boxed or highlighted. Work through the examples. See if you can do them without looking at the text. Try some of the problems. If you can work out details on your own, you will usually remember it a lot better. If you don’t, you will know what to ask questions about or what to pay closer attention to in class.