MATH 232
Calculus (III)
Spring 2006

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*While these are the official office hours, I am available at other times as well. If you want to meet at a time outside of office hours, the best option is to set up an appointment with me. You can also just drop by any time, but you may want to call first to see if I’m there.


Scientific calculators (not graphing calculators!) may be used on exams, so you should have one. A graphing calculator may be useful for checking answers on homework, exploring concepts, etc., but is not required.

Prerequisites. A grade of “C” or better in MATH 132 (Calculus II).

Catalog Description. Vectors, lines, and planes, vector valued functions, partial derivatives, multiple integrals, calculus of vector fields.

Course objectives. The purposes of this course for the student include (1) Developing an understanding of the fundamental definitions and concepts of analysis, (2) Developing computational skills in real analysis, (3) Improving reasoning, critical thinking, and problem-solving skills, (4) Sampling some of the many application areas of continuous mathematics, (5) Acquiring an appreciation of the concepts that form the foundation of twenty-first century science and technology, and (6) Learning to communicate mathematical ideas, arguments, and results.

Expected results. By the end of this course, students should (1) Understand and be able to work with the key concepts of multivariable calculus including vectors and vector spaces, functions of several variables and vector-valued functions, surfaces, spherical and cylindrical coordinates, continuity, differentiability, the Chain Rule, and vector fields, (2) Be able to compute essential quantities in multivariable calculus including dot and cross product, derivatives and partial derivatives, directional derivatives and gradients, multiple integrals and iterated integrals, line integrals, curl, and divergence, (3) Be able to compute arc length and curvature of a curve in space, determine tangent planes and linear approximations, find maximum and minimum values of a function of two variables, and change variables in multiple integrals, (4) Understand and be able to use the key theorems of multivariable calculus including Fubini’s Theorem, Green’s Theorem, Stokes’ Theorem, and the Divergence Theorem, (5) Be able to use computer software (Maple) to explore concepts and solve problems in multivariable calculus, and (6) Be able to apply the techniques of multivariable calculus to solve various physical problems.
Content and Methodology. The course will cover the material from Chapters 9 through 13 of the text, with some omissions possible. Typically, we will cover a section of the text in one to two meetings. The beginning of each class period will be reserved for discussion of the homework and other questions. Up to 1/3 of the period may be used for this purpose. Most of the remaining time will be used for presentation of new material. Students are encouraged to ask questions and make relevant comments at any time. There will also be brief quizzes and possibly other activities.

Homework and quizzes. Homework will be assigned from each section. Do the homework! How well you do in the class is directly related to how much homework you do. If you don’t do the homework, you probably won’t pass. It is also to your advantage to ask questions about homework problems that give you difficulty. You may also find it helpful to read the sections in the textbook.

Your completion and understanding of the homework will be assessed regularly. Occasionally the whole assignment might be collected. More often I will specify a few exercises for you to turn in. At other times there will be quizzes on the homework during class. Sometimes the quiz questions will come directly from the homework, and sometimes they will be different problems of the same type. Quizzes may be announced or unannounced, and you will typically have between 5 and 15 minutes to complete each one depending on the type and length. QUIZZES MAY NOT BE MADE UP, except when university regulations dictate otherwise. (See the Attendance Policy section below.) Missed quizzes will result in a grade of zero. The combined homework/quiz grade will be out of a maximum of 150 points, so if we go above 150 possible points, you will have opportunity to make up points from anything you missed.

Due dates for all assignments will be specified, and no late work will receive full credit, except when required by university regulations on absences. (See the Attendance Policy section below.) I define work to be late if it is handed in after the beginning of the class period following the due date. Late work can still be handed in and graded, but will receive credit for only 50% of the points earned. No late work may be handed in after the last day of class or more than one month after the original due date.

As an additional incentive to do your best on the homework, you may present the solution to a homework question posed by another student for two points extra credit. Students with questions about homework problems should write the problem numbers on the board in the designated area upon arrival to class. Another student can choose one of these problems and write the solution on the board. When class begins, the student should be ready to explain the solution and answer any questions about it. Due to time constraints, you must begin writing your solution before class time in order to receive credit!

Exams. The purpose of the exams is to determine your level of mastery of the concepts of the course. They will test not only your ability to memorize, but also your ability to think. There will be three 50 minute in-class exams and a 110 minute comprehensive final examination. The tentative dates of the in-class examinations are February 7, March 6, and March 29. The final exam will be given on Monday, May 8, at 3:00pm in the room in which we normally meet.

Normal make-up exams will be given only in serious and unavoidable circumstances (or in other situations sanctioned by the University) and only if your request to make up an exam is approved by the instructor within 72 hours of the in-class exam. Make-up exams must be taken within two class periods following the day of the exam. If these conditions are not satisfied, it is understood that the opportunity to make up the examination at that time is voided. In this case, exams may still be made up during the special make-up exam period during finals week. The special make-up exam period is 10:00am–11:50am on Wednesday, May 10.
Projects. Several projects will be assigned during the semester, including at least two that require using the mathematical software system Maple. The appropriate resources and instruction in Maple will be provided when the projects are assigned. Projects will be worth around 25 points, with some variation depending on the size. See the Homework and quizzes section for information about late work.

Grading and Evaluation. Performance in this course will be evaluated on a percentage system. Each of the three 50-minute exams is worth 100 points, the final exam is worth 150 points, projects will account for 50-150 points, and homework and quizzes will amount to at least 100 points. Thus final grades will be based on approximately 600-700 points. To obtain your percentage at any time during the course, divide the number of points you have earned by the total number of points available up to that time and multiply by 100. I will also update these totals and have them available for your reference at various times during the semester.

Letter grades will be assigned as follows based on a student’s final percentage:

- 90 and above: A
- 80-89: B
- 70-79: C
- 60-69: D
- below 60: F

The instructor reserves the right to lower the grade ranges. The grade ranges will not be raised.

Attendance Policy. We will follow the attendance policy of the University. (See pp. 44-45 of the 2005–6 ULM catalog.) Attendance is not officially a part of the grade. However, you probably won’t be able to pass the course if you do not attend regularly. Learning calculus is a cumulative experience. If you miss class even once, you may have difficulty catching up. If you must be absent, please notify the instructor ahead of time. An attendance sheet will be passed around each time the class meets. It is your responsibility to sign this sheet each period in order for your attendance to be official.

The university policy defines excused absences. In a nutshell, you have a university excuse if you are participating in an official university function, hospitalized, at a doctor’s appointment, or attending the funeral of a close relative. In these cases, missed work can be made up with full credit possible. The appropriate documentation must be provided to the instructor within three days of returning to classes.

For this course, the University considers six unexcused absences to be excessive. If a student accumulates excessive absences, the instructor may choose to recommend to the dean that the student lose the right to continue in the course and be given a grade of “F.”

Special Accommodations. “Any student with a physical disability or learning disability who needs accommodations should inform the instructor at the beginning of the course. Students with special needs are encouraged to contact the Counseling Center at 342-5220” (p. 52, ULM Catalog 2005-2006).

Withdrawal Policy. The drop policy for this course will be that of the University. (See pp. 46-47 of the 2005–6 ULM Catalog.) IT IS YOUR RESPONSIBILITY TO KNOW AND COMPLY WITH ALL DEADLINES. The last day to drop this course or resign from the university with an automatic grade of “W” is Wednesday, March 29.

Academic Dishonesty/Misconduct. The University has explicit rules governing academic dishonesty and academic misconduct. The policies are detailed in the ULM Catalog under the heading “Academic Cheating and Plagiarism” (pp. 63–65). The university policies will be followed in this class. The minimum penalty for an act of academic dishonesty will be the assignment of a grade of zero on the examination, quiz, or homework assignment.
You are encouraged to work together on homework and in learning the material. While working with another person or in study groups is permitted, **all written work submitted must be your own.** Copying someone else’s problem solution or showing your written solution to someone else is prohibited. In order to be successful in learning the material and preparing for the examinations, you need to try to work out the homework problems yourself as much as possible before discussing them with anyone else.

**Daily Schedule.** See [http://www.ulm.edu/~jcox/calculus3/sch.pdf](http://www.ulm.edu/~jcox/calculus3/sch.pdf) for a tentative daily schedule for this course.

Any changes to this syllabus will be communicated in class by the instructor.