Calculus III

MA 242 007–Spring 2003
MTWHF 11:20-12:10 pm–HA 263

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Office Hours: MTWHF 11:30-12:00 or by appointment

Course Description and Goals

Calculus is the necessary prequisite for advanced mathematics and most engineering courses. In Calculus III, you extend the concepts of Calculus I and II in 2D to 3D and beyond. You will become familiar with concepts like: vectors, planes, space curves, conic sections, partial derivatives, directional derivatives, gradients, double and triple integrals, and line integrals, all of which enable the mathematician to solve some very interesting problems. What distance has the comet following the trajectory given by $f(x(t), y(t), z(t))$ travelled after 3 days? What direction should a hiker travel if he is interested in reaching the summit as soon as possible? What is the surface area of a donut-shaped snow tube?

As a graduate of this course you will be able to do the following:

- explain and define fundamental concepts of multivariate calculus.
- use class concepts to model real-world situations mathematically, thereby increasing your problem-solving skills.
- work in groups efficiently and effectively. We will break into small groups often. You can learn a great deal by engaging with classmates around a key concept or problem.
- use the solid mathematical foundation developed in MA 242 for success in later major courses.

Text

James Stewart. *Calculus Concepts and Contexts.* Second ed. Brooks/Cole, 2001.

Course Requirements and Evaluation

- Course meets: MTWHF. Maple labs are on H, about every other week. All labs are held in HA 314. This class has 5 Maple sessions on the following dates: 1/16, 2/20, 3/20, 4/10 and 4/24.
- Attendance: University policy states that attendance must be taken in all 100 and 200 level classes. No distinction will be made between excused and unexcused absences. Students with good attendance (5 or fewer absences) will be rewarded by adding 40 points to their Maple Total points.
- Test Dates:
  - Test 1 - Wed. 1/30 - covers 9.1-9.6, 10.1-10.4
  - Test 2 - Fri. 2/22 - covers 11.1-11.7
  - Test 3 - Fri. 4/5 - covers 12.1-12.5, 12.7-12.8, App. G, 9.7
  - Test 4 - Fri. 4/26 - covers 13.1-13.6, 12.6
  - FINAL - Tues. 5/13, 8-11am, HA 263, cumulative
- Make-up Tests: University policy requires that all anticipated absences on test days be excused in advance (death in the family, university activity requiring travel). Emergency absences should be reported within 1 week of returning to class. Make-up tests will not be given, instead your final exam grade will count as the percentage of weight associated with the missed test. Note that this is not recommended. Students generally struggle on the final exam due to its cumulative nature, so please plan accordingly and do everything possible to make it to every test.
- Grading scale:
  - 90-100 A
  - 80-89 B
  - 70-79 C
  - 60-69 D
  - 0-59 F
- Grading breakdown:
  - Tests (4) 55 %
  - Final exam 20 %
  - Maple, quizzes, class activities, other 25%
- Maple: Five Maple homeworks are due periodically throughout the semester. It is your responsibility to keep up with these. Late extensions cannot be given. Please see the course organization schedule for due dates. Attendance at Maple labs counts as part of your overall class attendance.
- Homework: As this is an intensive, fast-paced course with over 38 students, homework will be assigned daily but not collected. In order to motivate you to do the problems, however, there will be daily quizzes. Suppose on Monday, I assign 15 problems for homework. You are encouraged to work through these problems Monday night, writing steps and solutions in your notebook. On Tuesday, class will begin with 2 or 3 randomly chosen homework problems from Monday's assignment. The quiz will be closed textbook, open notebook. If you have worked out the problem, you may copy the solution onto your quiz. If not, you must work the problem on the spot. One other feature of the daily homeworks is bonus problems. Each section's homework will contain 1 or 2 bonus problems. These can be used for extra credit. To submit a bonus problem, write the solution on a separate piece of paper with all steps involved and turn it in the next class period. These will be graded individually. Depending on the difficulty of the problem, you can earn yourself 1 or 2 extra credit points for the next test for each correct bonus submission.

- Resources for help:
  - Instructor
  - Multimedia Center - HA 244 - video-taped lectures, computer-assisted tutorials
  - Maple tutoring - HA 269
  - One-on-One Tutoring - Nelson 126 - first-come, first-serve
  - Classmates
- Academic Integrity/Disability Services: University policies on academic integrity and disability services will be strictly enforced.

Course Organization

See website for day-to-day schedule:

`https://courses.ncsu.edu/classes-a/maple_info/www/ncsu_maple_site/index.html`