

MathU242

Calculus II
Syllabus

Fall 2004

Instructor: Bob Lupi

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Office Hours: Mon, Wed 12:00-1:00

Tue 6:00-7:00

Text: *Johnston & Mathews' Calculus*, Addison Wesley

This course is a one-semester continuation of the subject of Calculus, following the material covered in the syllabus of MathU241. We will use the **Integral Calculus** to describe growth and size in physical processes. This focus on mathematical modeling of reality will frequently lead us into word problems. The difficulties in word problems involve language and our intuition about reality as much as mathematics. We will work on this area of common concern to students of mathematics, physics and engineering. We will study **separable differential equations** in this process. We will also study infinite series, **power series** and the beginnings of **Linear Algebra** through the study of vectors in three dimensions and the algebra and geometry of linear functions.

Course Objectives:

This course has two main goals: to have students understand the concept of the **integral** and to enable students to display that understanding through a variety of applications, and to gain the rudiments of the **algebra of linear spaces and functions**. Specific, measurable, manifestations of your understanding that will be tested during the semester include your ability to:

- Calculate antiderivatives of algebraic, trigonometric, and transcendental functions
- Calculate antiderivatives using substitution, integration by parts, and partial fractions
- Calculate antiderivatives using tables
- Solve differential equations which simply require antidifferentiation and insertion of initial data
- Approximate definite integrals using finite sums
- Calculate average values, areas, volumes, lengths and work using definite integrals
- Approximate definite integrals using the Trapezoidal Rule and Simpson's Rule
- Determine whether improper integrals (integrals involving infinity) converge or diverge, and calculate their value if they converge
- Derive Taylor polynomials and series and estimate errors using them
- Recognize and calculate with geometric series, and be able to use the ratio test and the alternating series test with its error term
- Derive equations of lines in three dimensional space
- Calculate with (3X3) matrices and determinants, understand the geometry associated to these algebraic operations, including knowledge of planes in 3-space and the geometry of linear functions represented by matrices

- Calculate using matrices with calculus to examine three dimensional parametric motion

Course Policies:

1. There will be weekly quizzes (usually during the first 20 minutes of the class). The two lowest quiz grades will be dropped. There will be no make-up quizzes. If you miss a quiz for any reason, the next quiz in the sequence will be counted an extra time to replace the missing grade.
2. There will be two exams on the material indicated on the last page of the syllabus. There are no make-up exams. If you miss an exam, your final exam grade will be counted an extra time to replace the missing grade.
3. Homework will be assigned at each class but will not be graded. You are expected to keep up with the homework in order to perform well on the weekly quizzes. The homework will, however, be collected and used to determine a student's grade if he or she is on the borderline of two grades.
4. Your grade in the course will be determined as follows:

Quizzes: 10%
 Hour Exams: 25% each
 Final Exam: 40%

And you will be graded according to the following scale:

<u>Final Average</u>	<u>Grade for Course</u>
93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
63-66	D
60-62	D-
0-59	F

Note the following dates:

1. Friday Sept 24: Last day to drop a class without a "W" grade
2. Monday Oct 11: Columbus Day Holiday
3. Thursday Nov 11: Veteran's Day Holiday
4. Friday Nov 19: Last day to drop a class with a "W" grade
5. Wed Nov 24: Classes end at 11:35 am. Thanksgiving Recess Nov 25-28

6. Classes end on Wednesday December 8. Thursday December 9 is a reading day.
7. Final Exam period is December 10-17

It is hoped that your experience in Calculus II is a good one. However, if you have any concerns or complaints about how the course is proceeding, your first step should be to talk with your instructor. If this course of action does not seem to help, or if you are uncomfortable discussing the problem with your instructor, you should contact the course coordinator:

Bob Lupi, 543 Nightingale

If Bob Lupi is unavailable or you wish to talk with someone else, you should contact the Vice-Chairman of the Mathematics Department:

Prof. Donald King 447 Lake Hall

Algebra Proficiency:

A common problem in Calculus courses is that students learn the Calculus material, but have such weak algebra skills that they rarely obtain correct answers to problems. We will require correct algebra work throughout the semester. Even though this is a calculus course, you will lose points for pre-calculus errors.

Algebra and Calculus Help and Tutoring:

There are many resources for improving your algebra and Calculus skills. The best strategy is to go over any problems with your instructor. Other resources: walk-in tutoring in Cahners Hall and from Engineering tutors in 222 Snell Engineering, tutoring by appointment (sign up in the Media Center in the library), and study aids in the library (Schaum's Outlines are great).

Excused Absences or Late Work:

In order to turn in assignments late or to take make-up quizzes and tests, students must bring written proof of some emergency situation; notes from doctors or nurses, documents verifying court appearances, receipts from having a car towed are all examples of valid documentation. Notes from family members are not acceptable. If a situation is of a personal nature, discuss the matter with your academic advisor; an e-mail message from your advisor saying that they believe that you should be allowed to make-up work is acceptable.

Cheating is an insult to honest students: it will not be tolerated. The University's cheating policy and related disciplinary actions are detailed in the Student Handbook; the Handbook also includes a description of what is considered cheating by the University. Cheating in this class includes (but is not limited to): looking at the papers of others during a quiz or test, talking to other students during a quiz/test, looking at notes during a quiz/test (unless it is specifically announced that you may), copying other students' work outside of class, and obtaining help from others on take-home tests.

In this class, working together on homework is NOT considered cheating. Please be aware that this policy on working together outside of class varies greatly from one course to the next; the policy on what is allowed, that has been described in this paragraph, may well be considered cheating in your other classes.

The use of advanced calculators is NOT considered cheating in this course. Be aware, however, that other courses may well have a policy barring such calculators. Also, your instructor reserves the right to decide on the spot between what constitutes a “calculator” and what constitutes a full-fledged “computer”.

The use of cell phones in the classroom during class is not allowed.

All incidents of cheating will be reported to the Office of Judicial Affairs.

If you have any questions as to what constitutes cheating, please ask me.

Attendance:

It is essential that you attend class regularly. The easiest way for you to learn the material, and to know what material has been covered, is to come to class each day. Students are responsible for finding out what material has been covered or what announcements have been made on days that they miss class.

Please note that we will treat you as an adult here. If you must miss a class, be late or leave early, it is expected, as polite behavior, that you will contact the instructor involved ahead of time and reach an agreement. This sort of behavior goes a long way when you have to miss a quiz, for instance. If you do not do this, the ball is in your court to make up work or use the missed quiz as the quiz which you drop.

The following page includes a calendar with homework problems to be covered. They may change as we progress through the course.

Schedule of Topics and Assignments

Topic	Homework
5.5 Integration by Substitution	1. page 383 #1-17 odd, 21, 25-39 odd
5.6 Area between Curves	2. page 392 #1-3, 5, 7, 15, 25, 29
5.7 Integration by Parts	3. page 402 #1-5, 7-10, 12
5.8 Integration by Partial Functions	4. page 412 #20-25, 44, 45, 48, 51
5.9 Separable Differential Equations	5. page 419 #1, 3, 4, 6-8, 19, 23, 25, 28
5.10 Numerical Integration	6. page 429 #1-3, 12, 14
6.1 Volumes by Cross Section	7. page 453 #1, 3, 5, 7, 12, 13, 16, 20, 29
6.2 Volumes by Shells	8. page 459 #2, 3, 4, 9
6.3 Polar Coordinates	9. page 470 #13, 15, 17, 18, 22, 23
6.5 Areas in Polar Coordinates	10. page 484 #2, 3, 5, 10, 25

*****EXAM ONE UP TO HERE *****

6.4 Arc Length and Unit Tangents	11. page 479 #2, 4, 7, 10, 19, 25
6.6 Work	12. page 494 #1-6, 9-11, 19, 21
6.9 Improper Integrals	13. page 528 #2, 3, 9, 13, 14, 19, 29
7.1 Taylor Polynomials	14. page 550 #3, 6, 7, 12, 18, 23, 25, 29, 30, 33
7.2 Approximations and Error	15. page 560 #1, 4, 7, 8
7.3 Sequences	16. page 576 #3, 5, 8, 11, 13, 14, 18, 22, 25, 30, 32
7.4 Infinite Series	17. page 587 #2,3,57,14,15,19,23,26,27,30,36,40,43
7.5 Tests for Convergence	18. page 603 #3, 9, 12, 14, 25, 27
7.6 Power and Taylor Series	19. page 615 #1-3, 7, 8, 10, 15
7.7 Working with Power Series	20. page 623 #1, 5, 8, 9, 13, 21, 22, 25

*****EXAM TWO UP TO HERE *****

8.1 Vectors in 3 Dimensions	21. page 643 #8, 9, 11, 14, 16, 17 21, 32, 39, 53
8.2 Matrices and Determinants	22. page 657 #4-6, 15, 18, 22, 24, 29, 31
8.3 Cross Products	23. page 666 #1, 3, 5, 7, 21, 27, 30, 34, 36, 50

Review and Cumulative Departmental Exam