

MathU242
Spring, 2005

Calculus for Science and Engineering
Mustafa Kesir

Syllabus

Text: *Calculus* by Johnston and Matthews

My Office: 563 Lake Hall **Phone:** 617-373-4592 (Office) **e-mail:** kesir.m@neu.edu

Class Meetings: 1:35-2:40 Mon-Wed-Thu in 130 Hurtig Hall

Office Hours: 12:00-1:00 Mon-Wed-Thu in 563 Lake Hall.

Introduction

This course is a one-semester continuation of the subject of Calculus, following the material covered in the syllabus of MathU241 during the fall semester of 2004. We will use the Integral Calculus to describe growth and size in physical processes. This focus on the mathematical modeling of reality will frequently lead us to solve word problems. The difficulties in solving word problems involve language and our intuition about reality as much as they involve mathematics. We will work on this arena of common concern to students of mathematics, the sciences 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.

The three main goals of the course are:

- 1) To understand the concept of the integral and to display that understanding through a variety of applications.
- 2) To gain an understanding of the rudiments of the algebra of vectors.
- 3) To understand the use of Taylor's Series as approximations to functions.

Grades and Organizational Stuff

The instructor reserves the right to change this syllabus according to the needs which may arise in this class during this semester. Students are responsible to be aware of what goes on in the classroom including the announcement of exam dates, material to be covered on exams and any adjustments to this syllabus. If you have any questions that you are not comfortable asking in class please feel free to ask me after class or come to my office hours. The grades will be determined as follows:

- We will have two midterms on February 10th and on March 24th. The average of these midterms will account for 40% of your grade in this course.
- There will be at least one quiz each week. You can drop the least one, and then the average of these quizzes will account 10% of your grade.
- There will be three homeworks prior to midterms and the final. The average of homeworks will be 10% of your grade.
- The two-hour, common, commonly graded, final exam (on 22nd of April) will count as 40% of your grade in this course.
Thursday, February 10th Midterm I --- Thursday, March 24th Midterm II --- Friday, April 22nd
FINAL --- Homework due dates will be announced in class.

Grading Scale: 100-93=A; 92-90=A-; 89-87=B+; 86-83=B; 82-80=B-; 79-77=C+; 76-73=C; 72-70=C-; 69-67=D+; 66-63=D; 62-60=D-; 59-0=F.

Departmental Policies

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".
- 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.
- "It is University policy that no grade, including an incomplete, can be changed after one year. Exceptions must be authorized by Academic Standing Committee."
- "All students without legitimate conflicts (approved by the instructor) will take the final exam at the scheduled time. Do not make travel plans that conflict with the final exam. "
- 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:
Prof. Maurice Gilmore 443 Lake Hall 617-373-5675 gilmore@neu.edu
If professor Gilmore 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 617-373-5679 donking@neu.edu

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.

Tutoring:

Free tutoring is available in room 102 Cahners Hall on Mon – Wed 9:15am – 8pm, Thurs 9:15am – 4pm, and Fri 9:15am – 1pm. There are also engineering tutors in 222 Snell Engineering, sign up in the Media Center in the library. Also, study aids are available in the library. In particular Schaum's Outlines are good resources.

Schedule of Topics and Assignments

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

WEEK	SECTION	TOPIC	ASSIGNMENT
Jan. 5-7	Review of 5.5, 5.6	Substitution, Formulas #1-40 & Areas Between Curves	5.6 #1, 7, 8, 15, 16, 25, 29
Jan. 10-14	5.7 & 5.8	Integration by Parts & Partial Fractions	5.7 #1, 3, 4, 5, 9, 12 & 5.8 #19, 22, 26, 44, 49
Jan. 17-21	5.9	Separable Differential Equations	5.9 #1, 4, 7, 10, 19, 23, 25, 28
Jan. 17th	M. L. King's Birthday	University Closed	
Jan. 24-28	5.10 & 6.1	Numerical Integration & Volumes by Cross Sections	5.10 #1, 2, 3, 12, 14 & 6.1 #1, 7, 12, 13, 20, 21, 29
Jan. 31-Feb. 4	6.2 & 6.3	Volumes by Shells, Polar Coords. & Parametric Eqns	6.2 #3, 9, 13, 21 & 6.3 #13, 15, 22, 23, 25
Feb. 7-11	6.4 & 6.5	Arc length, Tangents & Areas in Polar Coords.	6.4 #4, 10, 19, 25 & 6.5 #2, 3, 5, 10, 25
Feb 10	MIDTERM I		
Feb. 14-18	6.6	Work	1, 2, 6, 10, 27, 30
Feb 21-25	6.9 & 7.1	Improper Integrals & Taylor Polynomials	6.9 #2, 3, 9, 14, 19, 29 & 7.1 #3, 7, 12, 18, 25, 29, 30
Feb. 28-Mar. 4	Spring Break		
Mar. 7-11	7.2 & 7.3	Approximations, Error & Sequences	7.2 #1, 4, 7, 8 & 7.3 #3, 5, 11, 13, 14, 22, 25, 28, 30, 32
Mar. 14-18	7.4 & 7.5	Infinite Series & Tests for Convergence	7.4 #3, 6, 7, 14, 15, 19, 23, 36, 40 & 7.5 #3, 9, 12, 14, 25
Mar. 21-25	7.6 & 7.7	Power & Taylor Series, Working With Power Series	7.6 #1, 2, 10, 15 & 7.7 #1, 5, 8, 9, 13, 22, 25
March 24	MIDTERM II		
Mar. 28-Apr. 1	8.1 & 3.5	Vectors in Three Dimensions & Dot Products	8.1 #8, 9, 11, 14, 16, 17, 21, 32, 39, 53 & 3.5 # 1, 3, 5, 9, 17, 25
Apr. 4-8	8.3	Cross Products	8.3 #1, 7, 21, 27, 30, 34
Apr. 11-13	Review		
Apr. 22	FINAL EXAM		

Some important Dates: Jan. 19th Last Day to file a final exam conflict form-Jan. 21st Last Day to Drop a Course without a W grade - Mar. 25th Last Day to Drop The Course with a W Grade.

GRADES	%
Midterms	20+20=40

Homeworks	10
Quizzes	10
Final	40