

MTH U242 -- Calculus II Summer I 2005 for Engineering, Math, Science, Computer Science

Instructor: Robert Case

Office and office hours : 543A Nightingale Hall ; conferences 9:45-11:45 Mon and Wed, by appointment

Voice Messages: 617-373-5124

E-mail: case@neu.edu

Class Meetings: Mondays through Thursday, 8AM –9:40 AM in Room 210 Shillman

Required Materials:

Text: *Calculus* by Johnston and Mathews, Addison Wesley publisher.

Calculator: scientific, graphing calculator (recommended: TI- 83)

Course Objectives:

Calculus is our principal tool for the quantitative understanding of all processes of continuous change. Because change is a most fundamental and universal aspect of existence, it is hard to overstate the importance of calculus. With regard to integral calculus, we study the mathematics of various processes of **accumulation**.

The topics considered in the course include **methods of integration and the application of integration to physical processes; introduction to modeling through differential equations; and infinite series**. Our study will include the context of vectors.

Specific and measurable manifestations of your understanding of these topics will be tested during the semester.

Course Policies:

- (1) There will be regular quizzes, a one-hour midterm, and a two-hour cumulative departmental final exam. In addition, a short modeling project will be designed and completed by each student. A short conference with each student will be scheduled during the session.

Grades: Quizzes: 35%

Midterm: 15%

Final Exam: 40%

Participation and short modeling project: 10%

- (2) It is expected that you will attend every class. The course moves very fast. It is possible to fall behind in a single day. If you miss class for any reason, make an immediate attempt to contact another student to discuss what you missed and how to catch up. Inform the instructor. The instructor's conference hours, email and voice mail are above.
- (3) You must attend the final exam. Do not make travel plans until you know when your exams are to be given, and **do not expect that you will be allowed to take the exam at any time other than when it is regularly scheduled**, except in the case of a Registrar-created conflict, such as two exams scheduled at the same time. If you miss the final exam, it will count as a 0 and you will fail the course.
- (4) In addition to consulting with the instructor, you may receive extra help for the course from Engineering tutors in 222 Snell Engineering, tutoring by appointment (sign up in the Media Center in the library), and from tutoring offered by the Mathematics Department. Please seek help as soon as you experience any difficulty; do not wait until just before an exam.
- (5) Although we will use graphing calculators in the course, your instructor will probably ask you to take certain quizzes or exams or parts of exams in which **all** electronic gear (including calculators, cell phones, PalmPilots, etc.) are excluded. In that case, such devices may not be left in the open, even in a closed or turned-off mode. It is likely that at least part of the final exam will be conducted on this basis. Failure to comply with instructions about this will be considered a form of academic dishonesty.
- (6) You should always turn off your cell phone when entering any class as a courtesy to everyone else.
- (7) You are responsible for finding out what materials have been covered or what announcements have been made. Saying that you missed class the day an important announcement was made is not an excuse.
- (8) If you have concerns about the course that cannot be resolved by discussing with your instructor, contact Professor Robert Case, case@neu.edu or if that is not sufficient, the Vice-Chairman of the Mathematics Department, Professor Don King, 447 LA, x5679, donking@neu.edu

Schedule of Topics and Homework Assignments

**Week 1. 5.5 Review of Integration Meaning and Formulas,
5.7 Integration by Parts
5.8 Integration by Partial Fractions**

**Week 2. 5.10 Numerical Integration
6.1 Volumes by Slicing
6.6 Work
6.3 Polar Coordinates and Parametric Equations**

**Week 3. 6.4 Arc Length and Unit Tangents
6.6 Areas in Polar Coordinates
6.9 Improper Integrals**

**Week 4. Differential Equations and Applications
Slope Fields
Euler's Method
Exponential Growth and Decay
The Logistic Equation**

The Course Project

**Week 5 7.1 Taylor Polynomials
7.2 Approximations and Error
7.4 Infinite Series**

**Week 6 7.5 Tests for Convergence
7.6 Power and Taylor Series**

**Week 7 Project Progress Report
7.7 Working with Power Series
Review**