

# MTH U142 – Calculus II

Spring 2007

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**Office Hours:**

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## Required Materials:

Text: *Calculus for the Life Sciences* by Greenwell et al, Addison-Wesley, 1<sup>st</sup> ed. (2003).

## Prerequisites:

MTH U141 or equivalent calculus preparation, including antiderivatives. We will review some beginning integral calculus material taught in MTH U141.

## Course Objectives:

To develop *graphical, numerical, and algorithmic* understanding of

- The basic ideas of integral calculus: the integral as accumulated change, amount from flow, and area under a curve.
- Definition of the integral as a limit of a sum. Approximation of the integral using Riemann sums, trapezoid sums, and Simpson's rule.
- Fundamental Theorem of Calculus, relating the integral and antiderivative.
- Applying integral calculus to find areas and volumes, including applications to probability.
- Multivariable differential calculus: partial derivatives, extremal values of multivariable functions, and tangent planes. Multiple integrals to find area and volume.
- Differential equations: solutions, slope fields, Euler's method, and separable equations.

*Students completing the course should be able to recognize and use the concepts and methods of calculus when they occur in their disciplines.*

## Course Policies:

- (1) There will be a weekly quiz to keep you up to date on the material. If you miss a quiz there is **NO** makeup. The best 8 quizzes will be used to determine your quiz average.
- (2) Homework will be assigned at each class and is to be handed in. Homework will be used to determine your grade if you are on the borderline of two grades.
- (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) 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. Note: saying that you missed class the day an important announcement was made is **not** an excuse, you are responsible for ALL material missed.
- (5) In addition to the Instructor's office hours, you may receive extra help for the course from the tutoring center at 540B Nightingale Hall, as well as tutoring by appointment (sign up in the Media Center in the library) and study aids in the library. Please seek help as soon as you experience any difficulty; do not wait until just before an exam.
- (6) The instructor reserves the right to change this syllabus according to the needs which may arise in this class during the course of the 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 which you are not comfortable asking in class please feel free to ask me after class or come to my office hours.
- (7) Although we will use graphing calculators in the course, there may be 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.
- (8) You should always turn off your cell phone when entering any class as a courtesy to everyone else.
- (9) 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. 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.
- (10) If you have concerns about the course that cannot be resolved by discussing with your instructor, contact Professor Anthony Iarrobino, [a.iarrobino@neu.edu](mailto:a.iarrobino@neu.edu) or if that is not sufficient, the Vice-Chairman of the Mathematics Department, Professor Stanley Eigen, 527 LA, x5647, [eigen@neu.edu](mailto:eigen@neu.edu).
- (11) Your grade for the course will be determined as follows:

|                    |            |
|--------------------|------------|
| <b>Quizzes:</b>    | <b>30%</b> |
| <b>Midterm:</b>    | <b>30%</b> |
| <b>Final Exam:</b> | <b>40%</b> |

Your final grade will be given by the following scale:

| <u>Final Average</u> | <u>Grade</u> |
|----------------------|--------------|
| 94 – 100             | A            |
| 90 – 93              | 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            |

## ***MTH U142 Homework Assignments***

| <u>Section</u>     | <u>Topic</u>                                     | <u>Problems</u>  |
|--------------------|--|--|
| §6.3               | Implicit Differentiation                         | 1-9 odd, 19-23, 35   |
| §6.4               | Related Rates                                    | 1-3, 11-13, 23-25, 28  |
| §6.5               | Differentials, Linear Approximation              | 1-8, 11, 12, 19-25   |
| §7.1               | Antiderivatives (Review)                         | 1-30, 45, 46, 48, 51-55  |
| §7.2               | Substitution Method                              | 2-34, 39   |
| §7.3               | Area and the Definite Integral                   | 1, 3, 4, 6, 9, 10, 13, 14, 16, 18, 19, 21, 23-25, 29, 31, 33, 34                     |
| §7.4               | Fundamental Theorem of Calculus                  | 2-22 even, 31-33, 42, 44, 46, 51, 54, 58, 59, 61, 62, 65                             |
| §7.5               | Integrals of Trig Functions                      | 1-15, 25-27, 32, 35  |
| §7.6               | Area Between Two Curves                          | 1-9, 22-25, 27, 29, 36   |
|                    | Chapter 7 Review                                 | 19-28, 31-33, 41, 42, 59-61, 63-65, 67, 70, 73-75, 78                                |
| §8.1               | Numerical Integration, Trapezoid, Simpson's Rule | 1, 5-7, 13, 15, 16, 25, 27, 28, 31   |
| §8.2               | Integration By Parts                             | 1-11 odd, 21, 23, 35, 40, 42-44  |
| §8.3               | Volume and Average Value                         | 1-11 odd, 18, 19, 21, 26-29, 40  |
| §8.4               | Improper Integrals                               | 1-8, 29-33, 37, 46, 47   |
|                    | Chapter 8 Review                                 | 6-9, 11, 13-15, 27-29, 35-40, 43-45, 47-49   |
| <br><b>MIDTERM</b> |  |  |
| §9.1               | Functions of Several Variables                   | 1, 2, 6, 7, 14-17, 22-28, 32, 36, 37, 41   |
| §9.2               | Partial Derivatives                              | 3-8, 18-25, 35-42, 47, 50-52, 56   |
| §9.3               | Maxima and Minima                                | 1-8, 21-23, 33   |
| §9.4               | Total Differentials and Approximations           | 1-3, 9-11, 15, 16, 18, 21, 22  |
| §9.5               | Double Integrals                                 | 1-7 odd, 13-17 odd, 23-26, 33-37 odd, 41, 43, 44, 53-55, 68                          |
|                    | Chapter 9 Review                                 | 5, 6, 14-16, 18, 26, 27, 35, 37, 45, 47, 48, 51-53, 57-60, 63, 64, 65-69 odd, 73, 74 |
| §11.1              | Elementary and Separable Equations               | 2-14 even, 19-23, 27, 28, 38, 40-42  |
| §11.2              | Linear First Order Diff Equations                | 1-7, 15-17, 31, 34, 35   |
| §11.3              | Euler's Method                                   | 1-5 odd, 12-14, 30-34  |
| §11.6              | Applications of Diff Equations                   | 1, 2, 3, 6, 7, 10-16   |
|                    | Chapter 11 Review                                | 5-20, 25-27, 33, 38, 47, 48, 50-52, 59, 60   |
| §13.1              | Continuous Probability                           | 1-7, 11-13, 23-25, 27, 28, 32, 33, 35, 37, 39  |
| §13.2              | Expected Values and Variance                     | 1-5, 9-13, 21-23, 25, 28-31  |
| §13.3              | Special Density Functions                        | 1-8, 11-14, 27, 28, 30-32, 35, 36, 38  |
|                    | Chapter 13 Review                                | 3-17, 22, 23   |

## **FINAL EXAM**