

MTH U141 – Calculus I

Spring 2005

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Office Hours:

Office: 521 Lake Hall

Required Materials:

Text: *Applied Calculus* by Hughes-Hallett et al, John Wiley & Sons, 2nd ed. (2001).
CLASSPAC: MthU141 Fall 05 (available at NU Reprographics by Sept. 12)

Prerequisites:

Knowledge of basic algebra at the level of MTHU121, including an introduction to functions and their graphs. A placement quiz will be given at the start of the course: you can use the result to gauge your preparation.

Course Objectives:

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

- The basic ideas of differential calculus, including: average and instantaneous rates of change, the definition of the derivative of a function at a point, the derivative function.
- Basic functions, such as polynomial, exponential, logarithmic, and trigonometric, using the graphing calculator as a tool.
- Applying calculus to optimize functions (max and min), to motion problems, mathematical models of physical/biological processes.
- The basic ideas of integral calculus: accumulated change, amount from flow, area under a curve (introduction).

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. Currently, the final exam is scheduled for December 13th, at 10:30 a.m.

- (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 or if that is not sufficient, the Vice-Chairman of the Mathematics Department, Professor Stanley Eigen, 527 LA, x5647, eigen@neu.edu.

(11) Your grade for the course will be determined as follows:

Quizzes: 30%
Midterm: 30%
Final Exam: 40%

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 U141 Homework Assignments

<u>Section</u>	<u>Topic</u>	<u>Problems</u>
§1.1	Functions	2, 4, 8, 9, 11, 22
§1.2	Linear Functions	2, 7, 9, 15, 22, 23, 26, 29 WS: 1A, 1B
§1.3	Average Rate of Change	5-8, 11, 13, 15, 22b, 22c, 24 WS: 2A
§1.5	Exponential Functions	1a, 1d, 3, 5, 10-15
	Compound Interest (pp. 82-86)	1, 2, 5, 8, 9, 12, 13
§1.7	Exponential Growth/Decay	1, 3, 4, 10, 11, 14, 16, 17, 21, 24, 31, 32
§1.8	Composites & Shifts	1, 3, 5, 7, 19, 24, 32, 34
§1.10	Periodic, Trigonometric Functions	2, 5, 9, 12, 23, 26, 27, 28, 29, 31
	Chapter 1 Review	14, 16, 18, 20-28, 30-33, 47-51
§2.1	Instantaneous Rate	1-4, 8, 12, 13, 17-19, 21 WS: 2A, 2B
§2.2	Derivative Function	1-5, 15, 17-21, 27, 29
§2.3	Interpreting the Derivative	4, 5, 6, 9, 22
§2.4	Second Derivative	1, 3, 7-12, 14-16, 25
	Chapter 2 Review	1-3, 7-12, 20, 22, 27, 28, 30, 31
	Focus on Theory: Chapter 2	1-3, 5-8, 25-29
§3.1	Power Rule	5, 9, 13, 17, 19, 23, 25, 28, 32, 33, 38, 49, 50
§3.2	Exponentials and Logarithms	1-23 Odd, 28, 31, 33
§3.3	Chain Rule	1-29 Odd, 32, 37, 39, 40 WS: 3A, 3B
§3.4	Product & Quotient Rules	3-27 Odd, 8-16 Even, 32, 34, 36, 39
§3.5	Trigonometric Functions	1-17 Odd, 23, 24
	Chapter 3 Review	1-36, 47-49, 56

MIDTERM EXAM

§4.1	Local Minima and Maxima	5, 6, 9-12, 15, 20, 21, 23
§4.2	Inflection Points	6-11, 14, 19, 21, 22, 24, 25
§4.3	Global Min/Max	1, 2, 12, 13, 15-17, 19-21, 23-25, 27, 28, 30, 31
§4.4	Min/Max in Profit/Cost	3, 11, 13-15
§4.7	Logistic Growth	3, 8, 9, 11-13, 16, 17
	Chapter 4 Review	3-12, 15, 20, 22, 23, 29, 35, 36
§7.1	Antiderivative	1-17 Odd, 18, 22, 25-39 Odd, 54-56
	Position, Velocity & Acceleration	WS: 4A, 4B, A1-A3
§10.1	Differential Equations As Models	1, 3, 5-7, 9, 12, 14-18
§10.4	Exponential Growth/Decay	1, 5, 7, 9-11, 14, 15

	Chapter 10 Review	WS: 5 1, 5, 15, 19, 22, 23, 27
§5.1	Accumulated Change	1-4, 7, 8, 10, 11, 13-16
§5.2	Definite Integral	1-4, 7, 8, 11, 12, 15*
§5.3	Integral & Area	1 & 2 **, 5-9, 10-12, 17, 18, 22, 29
§5.4	Using the Integral	1-3, 5-7, 9, 12-20, 24
§5.5	Fundamental Theorem	9-12
§7.3	Finding Definite Integrals	1-10, 25, 27, 28, 32, 39-40
	Chapter 5 Review	1-4, 5 & 6***, 12-15, 17, 21-23, 28, 30-34

FINAL EXAM

* Also use left and right Riemann sums, trapezoid sums for $n=5, 10, 50$ to estimate this integral

** Use Riemann sums

*** Use Fundamental Theorem of Calculus