Calculus has two main branches. *Differential calculus* is the study of rate of change, and its uses. *Integral calculus* is the study of how amount is deduced from rate of change. Students completing the course should be able to recognize and use the concepts and methods of differential and integral calculus when they occur in their disciplines.

Text

Hughes-Hallett et al, Applied Calculus, 3rd ed. (2005), John Wiley & Sons. Your instructor may also ask you to purchase Classpac material at NU Reprographics and/or download and print documents from the web.

Prerequisites

Knowledge of basic algebra at the level of MTHU121, including an introduction to functions and their graphs. You instructor may give an algebra quiz at the start of the course which you can use to gauge your preparation.

Goal

Develop graphical, numerical, and algorithmic understanding of:

1. the basic ideas of differential calculus, including average and instantaneous rates of change, and the derivative function;
2. the basic functions, including polynomial, exponential, logarithmic, and trigonometric functions, using the graphing calculator as a tool;
3. applications of differential calculus to optimization, motion problems, and mathematical models of physical and biological processes; and
4. the basic ideas of integral calculus: accumulated change, amount from rates, and the area under a curve (introduction).

Email, Web pages

Your instructor will give you his/her email address and (if there is one) the address of the class webpage.

Examinations and grading

It is up to your instructor to determine how many quizzes and/or longer tests will given during the term. There will be at least two hour examinations (or their equivalent) during the term. The final examination is a comprehensive two hour examination which will count for 40% or, if it is advantageous for you, 50% of your grade. All students except those with legitimate conflicts will take the final exam at the scheduled time. The final exam is cumulative and is common for all sections of MTH U141. *Do not make travel plans which might conflict with the final exam.*

It is the Mathematics Department policy that an I (Incomplete) grade is rarely given. It is intended to cover real emergency situations in which a student is doing reasonably well (at least C minus) but is unable, due to circumstances beyond the student's control, to complete all course requirements (e.g., is unable to take the final exam due to hospitalization). An I grade may not be used to rescue a failing grade or to postpone the final in the absence of a real emergency.

Problem resolution

From time to time, an issue or concern may arise in your interactions with your instructor. Do not hesitate to let your instructor know about the problem and attempt to resolve it. If there is a problem that cannot be resolved by discussion with your instructor and you consider the problem serious, you have two options. You are encouraged to contact the course coordinator, Professor John Frampton (527 Nightingale, 373-5525, *j.frampton@neu.edu*) or the Vice-Chair of the Mathematics Department, Professor Stanley Eigen (567 Lake, 373-5647, *eigen@lepton.neu.edu*).

Office hours and other extra help

Your instructor will announce his/her office hours during the first week of classes. Their is a *Mathematics Department Tutoring Center* in Room 540B, Nightingale Hall. Tutoring should begin there two weeks after the start of classes. The tentative schedule is 10am-8pm on Mondays, Tuesdays, and Wednesdays; 10am-6pm on Thursdays; and 10am-2pm on Fridays. This is walk-in tutoring; no appointment is necessary. The *Media Center in Snell Library* can give you a list of tutors who are available for one-on-one tutoring by appointment, at whatever times can be agreed upon by the student and the tutor. The Web page *http://www.academicguide.neu.edu/* has other helpful links to available academic assistance.

Calculator

You need to own and know how (or learn how) to use a graphing calculator. Your instructor may ask you to bring it to every class so that are prepared to use it in class when required. Learning how to use your calculator to do the kinds of things that calculus requires is considered part of the course. You should ask questions in class or get other help if you need it. You should not expect to ask questions about how to use your calculator when you are taking examinations.

Detailed course contents (2.4, for example, refers to Chapter 2, Section 4 of the textbook)

1. Functions	1.1–1.10
2. Rates of Change	2.1–2.4
3. Analytic tools for determining rates of change	3.1–3.5
4. Applications	4.1–4.4, 4.7
5. Differential equations	7.1, 10.1, 10.4
6. Integration	5.1–5.5, 7.3

Optional topics: Your instructor will choose one or more of the following optional topics. There will be one question on the final examination in which you will have a choice of problems to do, one of which will correspond to an optional topic which you have discussed in class.

1. More on optimization (using supplementary material).
2. More on related rates (using supplementary material).
3. More on differential equations (10.2, or 10.5).