

MA 271 Calculus with Applications

Cheryl Peterson
NSF 1115
227-1609
cpeterso@nmu.edu

Office hours: 2:00, on class days

By appointment: 12:30, 5:00 (other times possible)

Class days

Class will meet 4 days a week – the day off may vary from week to week, but will be announced in advance and posted on the class website.

Class website

Assignments, data sets, and other information pertaining to the course will often be posted on the class website, <http://mathlab.nmu.edu/~cpeterso/> or <http://mathlab.nmu.edu> (then select Cheryl Peterson's Page).

Prerequisites

Finite Mathematics (MA103); or College Algebra (MA104 or MA105); or equivalent.

Textbook

Calculus Concepts, LaTorre, Kenelly, Fetta, Harris & Carpenter, 3rd Edition, Houghton Mifflin

Computers & Calculators

We will be using laptop computers in this course. At times, you may be able to use a graphing calculator. We will frequently be working on problems in class – so you will need to have either a laptop computer or suitable calculator with you.

The university supplies the following software for University-owned computers.

- TI-Interactive (needs to be installed)
- Excel spreadsheet (already on the computer)

If you will be using a non-university-owned computer, check with me about what software you will need. (You will probably want to have TI-Interactive and a spreadsheet.)

Other Supplies

“See-through” (transparent) acrylic ruler – small 6” size is fine – for reading graphs, slopes, etc.

General Information

This is a one-semester calculus course with an emphasis on applications.

We will focus on understanding and problem-solving.

Current technology, using computers and calculators, is a powerful tool that can be used not only to by-pass tedious and difficult mathematical manipulations, but can also be used to help see important mathematical connections and patterns.

The book contains a lot of real data. We will start by looking at how to find a good mathematical *model* for the data. Then we will learn how to use calculus to solve problems using the data and the models.

Calculus is the study of *change* – the thing changing might be the speed of a car or falling object, the number of cases of a disease in an epidemic, the number of deer in a population, the number of people owning cell phones, the temperature of an object, etc. We may be interested in when the quantity is changing fastest or when it reaches a maximum. Calculus can help us to design an “optimal” container – for example, what shape would be best for a 20-ounce aluminum can if you want to use as little aluminum as possible – how does the surface area change as you change the radius of the can?

The core of the course is in chapters 1 through 7. Chapter 8, on trigonometric functions, will be incorporated into the other chapters. Additional topics, from chapters 9, 10, & 11, will be included as time permits.

Chapters 1 , 2 : Mathematical Modeling (how to fit a function to data).

Chapters 3, 4 , 5 : Rate of Change (*derivatives*)

Chapters 6 , 7 : Accumulated Change (*integrals*)

Chapter 8 : Trigonometric Functions

Chapters 9, 10 : Multivariable Change

Chapter 11 : Differential Equations

Grades will be based on exams, quizzes, and assignments, with the exams counting most heavily. Some assignments will be done individually, and some will be done in small groups. Exams will be approximately at the end of each chapter, plus a final exam. The final exam will be Wednesday, May 2, 12 noon to 1:50 pm.

Disability services

If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Disability Services Office at 2001 C. B. Hedgcock (227-1700; TTY 227-1543). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state and University guidelines