MA 104 College Algebra with Applications in Science & Technology — Fall 2007

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Office hours: 1:00, on class days

By appointment: 11:30, 4:00 (other times possible)

Class days

Class will meet 4 days a week – usually Monday, Tuesday, Wednesday, Thursday. However, there may be a few exceptions to this. In particular, during Labor Day week, we will meet Wednesday, Thursday, Friday; and during the last week of classes, the schedule may also be different than usual.

Prerequisites

Intermediate Algebra (MA100) or equivalent.

Textbook

***Functions and Change, A Modeling Approach to College Algebra*, Crauder, Evans, Noell,** Houghton Mifflin

We will be using the **2nd edition**. (There is a newer 3rd edition, but we will be using the 2nd edition. The NMU Bookstore has used copies available.)

Other supplies (optional)

An inexpensive "see-through" ruler (6-inch is good) can be useful for fitting a line through a set of data points.

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).

Computer (*and/or* Graphing Calculator)

We will make use of technology to model real-world situations and come up with solutions to problems. This will often involve graphs,tables,and formulas that we will have the computer (or graphing calculator) construct for us.

You will need either

- a **Laptop Computer, with *TI-Interactive* software** (similar to a TI-83 calculator), *TI-Interactive* will be provided for university-owned laptops.

  or

- a **Graphing Calculator with function tables** (a *TI-83 Plus* or *TI-84* works well; some other suitable calculators are *TI-86*, *TI-89*.

We may occasionally use a computer spreadsheet.

When using the computer, you may find it useful to also have a calculator handy for quick routine calculations. An inexpensive non-graphing "scientific" calculator will do for this.

We will use Laptop Computers and / or Graphing Calculators fairly often in class.

Goals

When you complete this course you should be able to

- Choose and set up appropriate mathematical models to describe real-world problems
- Understand the characteristics of various mathematical functions (linear, exponential, logarithmic, logistic, trigonometric, quadratic, power functions), and how the way in which they change distinguishes one from another
- Understand how knowing initial conditions and how one thing changes relative to another can give you a complete picture of how that thing behaves
- Use technology to set and solve problems – using graphs, tables, and formulas

General information

In this course we will use Mathematical Modeling to solve applied problems. Modeling methods such as Scatter Plots, Finite Differences, Least Squares Curve Fitting, Linearization (Curve Straightening) will be used to find a suitable Mathematical Function (Linear, Polynomial, Exponential, Logarithmic, etc.) to fit the data in a problem.

We will often work in small groups in class to collect and analyze data. Sometimes we will use data collecting devices such as motion detectors and temperature probes that can be linked directly to a computer or calculator.

There will be several exams, including a final exam, as well as quizzes to see how things are going. Altogether, quizzes will count at most as one exam. There will also be assignments to hand in. Some of these will be done in small groups and some will be done individually. The assignments will count approximately as one to two exams.

The final exam is scheduled for Tuesday, December 11, 12:00–1:50.

Alternate Courses

The math department offers three somewhat similar courses, all with MA 100 as prerequisite.

MA 105 COLLEGE ALGEBRA FOR CALCULUS PREPARATION: This is intended for students intending to take the standard calculus sequence. Compared to MA 104, there is more emphasis on algebraic concepts and perhaps a bit less on applications. The pace is fairly rigorous to be sure to cover all the material that will be needed for Pre-Calculus and Calculus courses.

MA 104 COLLEGE ALGEBRA WITH APPLICATIONS IN SCIENCE AND TECHNOLOGY: This is intended for those who do not intend to take the standard calculus sequence (but may take the one semester calculus-for-applications course), and need college algebra for their major (usually in science or technology). The course is applications-oriented, with a number of applications geared toward those interested in science and technology. Compared to MA 105, there is a bit more flexibility; the pace and topics covered can be modified to suit the needs of the students in the class.

MA 103 FINITE MATHEMATICS : This is also intended for students who do not intend to take the standard calculus sequence. It is also applications oriented, with applications often coming from business and the natural & social sciences.

Liberal studies requirement

This course satisfies the Foundations of Natural Science–Mathematics requirement.

Students who complete the mathematics courses should be able to demonstrate a basic understanding of mathematical logic; use mathematics to solve scientific or mathematical problems in college classes; express relationships in the symbolic language of mathematics; and appreciate the role of mathematics in analyzing natural phenomena.

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 by: coming into the office at 2001 C. B. Hedgcock; calling 227-1700; or e-mailing disserv@nmu.edu. 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.