MTH 110 Mathematical Reasoning
Summer 2014 Dr. Gisela Ahlbrandt
Fully online sections CRN 54343/54343

Coursepack (Required): Quantitative Reasoning in Mathematics
A Modeling Approach, by Gisela Ahlbrandt, Chris Gardiner et al.
2013/2014 edition
Available at the local bookstores (more below)

WebAssign Homework system required at http://www.webassign.net/
Scientific Calculator required
Graphing Calculator like TI82-86 recommended

General Education
This course will provide students with ways to approach the quantitative
information that they are certain to encounter in later coursework at Eastern
Michigan University, throughout their careers, and in daily life. The emphasis is
on learning methods for comprehending, analyzing and using quantitative
information and on techniques for using data to inform decisions about real-
world events and problems. For these reasons, MATH 110 will count for the
Quantitative Reasoning requirement in the General Education program

Education for Participation in the Global Community.

Very important notice
This course should NOT be taken by a student, who intends to major in
Elementary Education or in Special Education—Elementary. If you are not
certain whether you should be taking this course, talk to an advisor

Goals
MATH 110 is designed to give students an appreciation for and some facility
with ways in which mathematics can be used in real-world applications. The goal
of the course is to allow students to apply the mathematical skills they have
learned previously to problem situations that will be of interest to them and of
some relevance in their lives.

General learning goals include the ability to read and understand texts with
scientific or mathematical content, the ability to use a spreadsheet for
numerical operations and to read, produce and use graphs and reports.
We will start with a quick review of percentages and linear functions. We then
study financial models for savings accounts and credit cards. Finally we study
elementary probability and statistics in the setting of games and opinion polls.
Prerequisites
The official prerequisite for this class is beginning algebra, (MTH098 or placement). Relevant material will be reviewed quickly but is assumed to be familiar to students.

The elementary mathematics background is usually covered in 7th-12th grade in secondary schools. Since MTH110 is a college level mathematics course this material is naturally assumed to have been mastered before a student takes the course. The placement system tries to help to ensure that, but the system is not perfect and sometimes students with severe difficulties may be finding it helpful to first complete one of the courses MTH097 or MTH098, before they take this class. Other students may find that they need to spend considerable time on the review, since they might have forgotten the material. There is tutoring available in our tutor center in room 411 in Pray Harrold for students with access to the EMU campus. If you don’t have access to campus, and you know that you will need help, make sure you have a support system in place right away, before you fall behind.

Course Objectives
Upon completing the course, students should be able to:

• Carry out the steps of a mathematical modeling process.
• Apply a variety of mathematical models to problem situations.
• Analyze data using descriptive statistics.
• Calculate and interpret discrete probabilities.
• Use the normal distribution.
• Present a written or oral report outlining a problem situation, a proposed mathematical model, and a solution, together with a discussion of both the assumptions upon which the model is based and the limitations of the model.
• Use a spreadsheet program to produce tables and graphs, and include them in a written report.

Course Outline
1. Introduction to mathematical modeling
2. Using a spreadsheet for modeling
3. Direct proportion models
4. Linear models
5. Nonlinear models
6. Probability models
7. Descriptive statistics

We will cover selected sections in the corresponding chapters in the coursepack.
**Class organization**
This is fully online section. A corresponding face to face class meets during a regular semester for 150 minutes a week and requires daily homework to be completed. You should set aside at least 9 hours per week in a regular semester and twice that amount in the accelerated summer term to work on this course. The course pack is the textbook. In addition we will be using two online course shells. The first is EMU-online at [http://emuonline.edu/](http://emuonline.edu/). The second is WebAssign at [http://www.webassign.net/](http://www.webassign.net/).

You should start with reading the relevant material in the course pack and then work on the homework assignments in WebAssign. You need to present some of your solutions in the EMU-online discussion forum and have a chance to discuss the material with your group members. The due dates for all assignments are available on the class web site.

**Calculators**
You will need a scientific calculator, which is capable of computing exponential expressions like \((1+.3)^{10}\); a graphing calculator like the TI82 to TI86 is recommended but not required. You will need to use calculators on assignments and tests. The use of cell phones as calculators during tests is not permitted.

**Spreadsheets**
Some assignments will involve using a spreadsheet program. You have access to Microsoft Excel in many of the EMU computer labs if you are able to come to campus, but you may use another program if you prefer. I will be demonstrating Excel and the spreadsheets provided to you will also be created by Excel.

**Textbook (Coursepack)**
You can obtain the textbook from the local bookstores, like Neds, Mike’s and the EMU bookstore in the student center. You need the coursepack. If you are unable to purchase the text because of your location contact me. In my references I assume that you are using the 2013/14 edition of the coursepack. You can use an older version of the coursepack, if you can get it. This will be a bit cheaper. There will be slight changes since some typos have been corrected, but it will not impact you much.

**Information about WebAssign**
[WebAssign](http://www.webassign.net/) is an online homework system. For the first couple of weeks you can access it for free and then you will need to purchase the access for $24.95. Starting on May 1, 2014 you can self enroll into WebAssign. You will need to use the following Class Key: **emich 8667 5510**. Make sure you create an account the first time you log-in and then use that account information the next time again.
Use the following links for further information
http://www.emunix.emich.edu/~gisela/m223/WA_Student_Quick_Start.pdf
http://www.emunix.emich.edu/~gisela/m223/FDOC_self_enrollment.ppt.pps
Let me know if you have questions or concerns.

Written work
Written work must be presented in a format commensurate with that expected in any other college class. You must write in complete sentences, with correct spelling, grammar and punctuation.

Academic Honesty
I expect all students to abide by the University's code of conduct, and in particular to abide by rules concerning academic honesty. In order to assess how the class is going and what you have learned, I need to see your own work: your own words and the details of your own computations. You may work with other students or math tutors on your assignments, but you must do an independent write-up.

Special Needs
If you have a learning disability or a physical impairment that may affect your ability to do the work in this course, please let me know as soon as possible so that we can make appropriate arrangements.

I am not on campus during the summer semester.
My home phone is 734-665-2691, I might not be at home either. (Please, do not call me at home after 8 PM or on weekends.)
You can leave a message on my home answering machine. The best way to contact me is to write me an e-mail message.
My e-mail address is Gisela.Ahlbrandt@emich.edu.
My WWW-Page is http://www.emunix.emich.edu/~gisela/.

Office hours
Just email or phone me with any problems you are having.

Assessment
The homework on WebAssign is graded. Multiple submissions are allowed and the idea is that you should be able to redo the problems until you obtain 100%. The work in the discussion forum is evaluated according to multiple criteria and extra credit is assigned for special efforts. Timely submissions and staying on task is important. It's okay here to discuss difficulties with the material and you won't get graded down if you make mistakes, as long as you stay with the problem and work on finding a reasonable solution with your group members.
We will have a paper-and-pencil midterm and final exam. These tests will have to be taken at a proctored testing site. The final is cumulative. There are review sheets available for each test.

**Paper and Pencil Exams**
You need to take the midterm and the final exam at proctored exam sites. The easiest way to do this is to take the tests during the testing windows in the Math Department testing center. If you don’t have access to campus you need to find a certified proctored site. This can be an EMU extension campus, a library or similar institution. We can help you to arrange this. Send me an e-mail right away if you need to set up a proctored site off campus. If I do not hear from you I assume that you will take the exams in the testing center in room 411 Pray Harrold at EMU’s main campus.

**Schedule for the paper and pencil exams**
Midterm exam window: May 27-June 4
Final exam window: June 19 -26

**Rules during paper and pencil exams:**
- Use black or blue pen or pencil. No red pen, please.
- The tests consist of no-calculator portions and parts on which a scientific calculator needs to be used. For those portions only a calculator is allowed. You cannot use a cell phone or iPod-touch or similar communication device as a calculator.
Grade Computation
The grades will be computed as follows:

1. **Homework (WebAssign/EMU-online [416 points])**
   Most of this work consists of assignments submitted at the WebAssign site. Typically the problems can be submitted at least 5 times without any penalty.

2. **Discussion Forum at EMU-online [84 points]**
   This work consists in participating in the group discussion forum by submitting solutions to homework problems to the forum.

3. **Paper and Pencil Tests [500 points]**
   Midterm [250]
   Final Exam [250]

4. **Extra Credit [30 points max]**
   More details are contained in the EMU-online shell.

**Total points earned [1000 points max]**

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In order to pass the course the average score in the test portion has to be 50%. 