

Northern Michigan University
Department of Mathematics & Computer Science
MA105-55 (50678): College Algebra for Calculus Preparation (4 credits)
Web Based
Summer 2009 (May 18 – July 17)

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Office Hours: By appointment only

Prerequisite:

MA100 or satisfactory score on the Mathematics Placement Exam.

General Introduction and Goals:

This course satisfies the Foundation of Natural Science/Mathematics requirement [Division III]. Students who complete this course 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.

This course involves the continued development of students' abilities to manipulate algebraic statements and solve problems. It includes the study of functions, graphing, equation-solving techniques, exponents and logarithms, and systems of equations. Topics, applications and pace are tailored for those students intending to take calculus.

Text and Other Course Information:

College Algebra, Cristina Berisso, Content on Demand (2008). ISBN 1-59757-094-X

An access key for this text may be purchased directly from the Content on Demand web site at <http://www.codcourses.com/>. A free Windows-based graphing calculator/equation editor is available for students.

This course uses WebCT (Web Course Tools) so you must have Internet access in order to complete assignments and receive course information. To get to the WebCT log-on screen, go to <http://webct.nmu.edu/webct/entryPageIns.dowebct>. Your user id and password should be the same as your NMU campus email user id and password.

Pre-test

Each chapter has a pre-test, which is highly recommended for you to take in order to self-assess your current knowledge of the chapter topics and help determine where to focus your efforts as you go through the chapter. Feedback pointing students to the relevant section for each question is provided.

Lessons

Each chapter is broken into sections. Within each section are lessons that contain animations with audio, interactive exercises, practice problem and answer sets, videos, and quizzes.

Each section begins with a list of specific learning objectives. Lessons give students a thorough, straightforward presentation of the material, broken into small "chunks" of content. There is no extraneous information, allowing students to focus on the key elements of the specific concepts being conveyed. Equivalent to a traditional textbook explanation and lecture presentation, lessons allow students to set their own pace as they move through the material.

Within lessons, extensive use of animation helps students visualize difficult concepts and problem-solving steps. Some lessons also contain interactive examples that guide students step-by-step through problem solving, with hints for completing each step. Students are able to consider each step before requesting a hint.

Many sections contain interactive exercises (Java applets) that help students take their learning one step further. Problem solving tutorial videos (with audio) for every section allow students to watch an instructor hand-write and explain the solution to selected practice problems.

Practice problems and a complete answer set are provided for each section. Students work through problems related to the lesson. Answers are available, most with step-by-step solutions, for students to self-assess their progress and identify areas of difficulty.

Post-test

A cumulative posttest is provided for students' self-assessment, allowing them to seek help where needed before the chapter exam. Feedback pointing students to the relevant section for review is provided for each question.

Content Outline:

This course will examine topics from the following areas:

1. Review of Algebra
 - The algebra of polynomials and rational expressions
 - Solving linear and quadratic equations
 - Radicals and rational exponents
 - The coordinate plane and graphing
 - Solving systems of linear equations
2. Real and Complex Numbers
 - Subsets of the real number system: naturals, integers, rationals, irrationals
 - Complex numbers: their inception and arithmetic
3. The Graphing Calculator
 - Drawing graphs
 - Approximating solutions to equations, determining extrema, etc.
4. Functions
 - The function concept and functional notation
 - Expressing functional dependence algebraically
 - Combinations of functions; inverse functions
 - Graphs, and transformations of graphs, of functions
 - Linear, quadratic, polynomial, and rational functions
 - Functions involving radicals
5. Solving Polynomial Equations and Inequalities
 - Algebraic and graphical methods
 - The theory of Equations
 - Solving literal equations
6. Exponents and Logarithms
 - Properties of the exponential and logarithmic functions
 - Solving exponential and logarithmic equations
 - Applications of the exponential and logarithmic functions
7. Systems of Equations
 - Solving linear systems algebraically
 - Solving non-linear systems algebraically and graphically
 - Applications of systems of equations

8. Other Topics

- Matrices and determinants
- Permutations and combinations

Assessment Format: Specific information on each assessment measure is provided below.

- **Homework (30%):** Exercises from the online material will be assigned.
- **Examinations (70%):** You will be required to take a comprehensive end-of-chapter exam after completing each chapter. A final exam will also be given.

Grading Scale (%): Your course grade will be based on the percentages outlined under Assessment Format. Corresponding grades as a percentage of the total are listed below.

100 – 95.0: A	86.4 – 82.5: B	76.4 – 72.5: C	66.4 – 62.5: D
94.9 – 89.5: A-	82.4 – 79.5: B-	72.4 – 69.5: C-	62.4 – 59.5: D-
89.4 – 86.5: B+	79.4 – 76.5: C+	69.4 – 66.5: D+	59.4 – 0: F

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Anyone having civil rights inquiries may contact the Equal Opportunity Office, 502 Cohodas Hall, telephone number 906-227-2420.

ADA Statement:

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.