

Northern Michigan University
Mathematics and Computer Science Department
College Algebra with Applications in the Sciences and Technologies (4 credits)
MA104-02 (80438) MWRF 2:00 – 2:50, WS 3806

Instructor: Dr. Carol Bell

Office Phone: (906) 227-1603

Office Hours: MWRF 11:00 – 12:00, 1:00-2:00, or by appointment

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Prerequisite:

MA100 (passed with a C- or better) or satisfactory score on the Mathematics Placement Exam.

General Introduction and Goals:

This course is designed for students who need college algebra but do not intend to take calculus. The applications of algebra are stressed; mathematical topics are chosen primarily on the basis of their immediate applicability. Such applications are drawn mainly from the natural sciences and technologies. This course will prepare students to study Trigonometry, [MA 106](#), and Calculus with Applications, [MA 271](#). And although [MA 103](#) is the recommended preparatory course for the study of statistics, MA 104 is as an alternative prerequisite for Statistics. To move to the precalculus track ([MA115](#)) from MA104, a student must achieve at least a B- in this course.

This course satisfies the Foundation of Natural Science/Mathematics requirement. 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.

Text and Other Course Information:

- College Algebra and Trigonometry with Applications, 6th Edition, Levitan, Kolman, Shapiro, Bell. BVT Publishing (2011). ISBN 9781627516532 (Textbook +)
- Online course materials may be accessed at <http://www.bvtlab.com>. The course code is CD84C3.
- A non-CAS graphing calculator or download a TI Emulator for the TI-73, TI-83+, and TI-83+ Silver Edition at http://education.ti.com/educationportal/sites/US/productDetail/us_sdk_73_83_84.htm
1. Click on the download button underneath the calculator. Select the first link “TI-83 Plus SDK” and click “continue as guest.” Then, choose Run from the pop-up menu. You will need to restart your computer after installing the emulator.

To operate this emulator, instructions may be found at http://www.austintown.k12.oh.us/~aust_tr/homework/quickfiles/TI%2083%20and%2073%20Emulator/TI-83+%20Emulator%20Install%20and%20How%20to%20Use.pdf.

Learning Outcomes:

Upon successful completion of this course the student will be able to:

- Understand and apply the rules of linear, quadratic, polynomial, exponential, and logarithmic relations to solve equations.
- Understand and apply the concepts and properties of a function to model real-world situations, and solve scenarios involving these functions.
- Apply trigonometry to solve problems involving triangle relationships.
- Use calculators to set up and solve problems using graphs, tables, and formulas.

Evaluation of these learning outcomes will be done through assignments and exams.

Content Outline:

1. Review of Algebra
 - Polynomials and operations on polynomials
 - Solving linear and quadratic equations
 - Integral and rational exponents and radicals
 - Fractional expressions
 - The coordinate plane and graphing
2. Learning to Use the Calculator
 - To draw graphs and to solve equations and systems of equations
3. The Function Concept
 - Functional notation and graphs of functions
 - Expressing functional dependence algebraically
4. The Study of Special Functions
 - Linear, quadratic, polynomial, and rational functions
 - Functions involving radicals
5. Solving Equations
 - Algebraic and graphical methods
 - 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
 - Linear systems: solving algebraically, graphically
 - Solving special non-linear systems
8. Other Topics
 - Introduction to probability
 - Introduction to right triangle trigonometry

Classroom Laptop and Cell Phone Use:

Refrain from using your laptop for instant messaging, e-mailing, surfing the Internet, playing games, writing papers, doing homework, etc. during class time. Acceptable uses of your laptop include taking notes and working on assigned in-class activities, projects, and discussions that may be enhanced by laptop use. It is easy for your laptop to become a distraction to you and to those around you, including me. If you use your laptop during class, you will be expected to email me the notes you typed in class at the end of the class

period (I will not ask for them but will keep records of those who do/do not). Cell phones should never be used during class time.

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

- **Homework (20%):** Each chapter has several homework assignments covering one or two sections in the text. All homework is available in the BVT lab. Refer to text and class examples as well as the online resources (step-by-step solutions and videos) to aid in working the homework problems. You may redo any of the homework assignments until the due date.

- **Projects (20%):** Projects from the text will be assigned. You are allowed and encouraged to form study groups to complete the project assignments. If you desire, each study group may hand in a *single joint project assignment*. All members of each group will receive the common grade given for that assignment. You do not have to gain permission either to form or to dissolve a study group. If you form a study group and submit joint assignments, please follow these rules:
 - No more than three members to any group.
 - Each joint assignment must bear the signatures of each member of the group and must contain this statement: "I attest by my signature that I have made a substantial contribution to this assignment."

All projects must be done according to the guidelines indicated on the last page.

- **Tests (30%):** A comprehensive end-of-chapter test will be given after completing each full chapter or combined chapters (for material that is not based on a single chapter). A university-approved excuse is a required for rescheduling any exam. Make-up exams are not given so failure to notify me of your absence prior to the exam will result in a score of 0. Half the raw score on the final exam may be substituted for the lowest exam score. Practice tests are available in the BVT lab.

Testing Room Policy for Students:

1. Testing room (JXJ 2201) hours are strictly Monday-Friday from 8:00 am – 12:00 pm and 1:00 pm – 5:00 pm. Your exams will be taken away at 12:00 pm and 5:00 pm, whether you are finished or not. If there is a 2 hour time limit, you need to come at least 2 hours prior to closing for lunch and/or the day. Exams will not be given to you if you come later than that.
 2. The testing room is for make-up exams only. You must have a legitimate reason as to why you cannot make the regularly scheduled exam.
 3. Students with disabilities should work with the instructor and Disability Services to arrange for taking exams.
- **Final Exam (30%):** The final exam is comprehensive. The final exam date and time are noted below and are also available online.
Section 02 (2:00 – 2:50 class) Wednesday, December 9, 2:00 – 3:50

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

NMU’s Non-Discrimination Statement:

Northern Michigan University does not unlawfully discriminate on the basis of race, color, religion, sex, national origin, age, height, weight, marital status, familial status, handicap/disability, sexual orientation, or veteran status in employment or the provision of services, and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities.

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

Disability Services:

If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Dean of Students Office at 2001 C. B. Hedgcock Building (227-1700 or 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.

Important Deadlines

- Last day to drop with 100% refund (No grade): Tuesday, September 1, 5:00pm
- Last day to drop with "W" grade: Friday, October 30, 5:00pm

Project Guidelines

- 1) Remember to put your name(s) on each project assignment.
- 2) Projects are due at the beginning of class. If you are late to class, have your project in-hand so that you may hand it in as you walk into the room and before you find a seat. This is so that you do not disrupt the class.
- 3) You must submit all projects on 8-1/2" x 11" paper. The paper may be lined or unlined, preferably on white paper, but colored paper will be accepted.
- 4) If the paper is torn out of a spiral notebook, you must trim off the rough edge.
- 5) If the project requires several pages, please place the pages in order and staple them together before coming to class. There is a stapler available in the Mathematics and Computer Science department office that you may use, if you do not own one. Please do not crimp together or attach the pages in any other way.
- 6) All problems must be neat, organized, well labeled, and not crowded on the page. The instructor reserves the right to make you re-submit your work, if it is not legible and organized. The problems should appear in the same order in which they were assigned.
- 7) The work submitted should be your *final draft* and should not be marred with numerous cross-outs, erasures, or scrap work. Your solutions should provide explanations, when necessary, as to how you obtained your answers.
- 8) As a reminder, joint assignments must bear the signatures of each member of the group and must contain this statement: "I attest by my signature that I have made a substantial contribution to this assignment."

*There is a lot of evidence that a very beneficial way of learning mathematics is to learn to talk about mathematics. Study groups are a great way to learn mathematics!
Collaboration on the homework is suggested and recommended.*