

**Northern Michigan University**  
**Mathematics and Computer Science Department**  
**MA111-50 (10935) College Algebra (4 credits)**

**Instructor:** Dr. Carol Bell

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**Office Hours:** MWR 11:00-1:00 or by appointment (email me)

**Prerequisite:** MA 100 ("C-" or better) or appropriate math placement.

**Course Description (from NMU Bulletin):** The study of quadratic and higher degree polynomials and rational expressions, exponential and logarithmic equations and functions. Emphasis on exponential and logarithmic functions.

- [Applies toward the quantitative reasoning and analysis \(quar\) general education requirement.](#)
- [Applies toward the mathematics competency university requirement \(math\) general education requirement.](#)

**Text and other Course Information:**

You will need the following for the course.

- **Text:** Algebra & Trig, by Ron Larson, 11th edition, Cengage Learning. Hard copy or etext, but be sure you get the online homework package (WebAssign).
- A non-CAS graphing calculator (one that does not do algebra or have a problem solver, such as a TI-36)

We will be using WebAssign for the online homework. Click on the link in EduCat to set up your WebAssign account. You will need your NMU IN and the course key: **nmu 7015 0057**

**How to Use WebAssign – Student Overview:**

<https://www.youtube.com/watch?v=2eP385K0djg>

**Required Technical Skills:**

This online course uses both EduCat and publisher materials. There are minimal technical skills required of you to be successful in the course. You should be able to follow the directions provided by the publisher for setting up access to the text and online homework system. I recommend that you use Chrome, Firefox, or Safari to access the links in EduCat to various web sites with videos, practice problems, or other information for you to read. Please note that some of the resources may not have learner accessibility, such as a closed caption option on the videos so please let me know if you need an alternative means to access the course materials. Below is a list of technical skills you should have.

- 1) Log in to your EduCat account (<https://educat.nmu.edu/>) and access course materials provided in EduCat.
- 2) Use a scientific or non-CAS graphing calculator (one that does not do algebra).

- 3) Scan your written work using a PDF scanner on your phone. Recommended PDF scanners include, TurboScan, Genius Scan, and Camscanner.
- 4) Use email with attachments.
- 5) Use Zoom (video conferencing application).
  - You can download Zoom from <https://support.zoom.us/hc/en-us/articles/201362233-Where-Do-I-Download-The-Latest-Version->.
- 6) Capture work on your screen using the PrtSc key or some program (only necessary if you have questions on work done on your screen that you need to send me).
  - Windows instruction video (<https://www.youtube.com/watch?v=sPpYhwdYIes>)
    - Note my PrtSc key is located in the lower right part of the keyboard.
  - Mac instructions (<http://www.printscreenmac.com/>)

**Learning Outcomes:**

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

1. Perform operations with functions, including composition of functions.
  2. Determine the inverse relation for a given function and sketch both the function and its inverse map.
  3. Solve quadratic equations by factoring, square root method, completing the square, and quadratic formula.
  4. Perform polynomial long division and synthetic division
  5. Solving equations involving rational expressions, degree 1 and higher.
  6. Graph and determine the domain and range of a relation or function given its equation and/or graph (circles, quadratic, higher degree polynomials, rational, radical, exponential, logarithmic).
    - a. Determine the center and radius of a circle from its equation and construct the equation of a circle from its graph
    - b. Sketch of the graph of a polynomial function of degree three or larger given its factored form
    - c. Determine horizontal and vertical asymptotes of a rational function, and use that information to graph
    - d. Graph exponential and logarithmic functions and state asymptotes
  7. Apply transformations to graphs of equations and to functions.
  8. Use the following theorems (over the complex numbers): Remainder, Factor, Fundamental Theorem of Algebra, Rational Roots (with synthetic division), and Conjugate Roots to solve polynomial equations.
  9. Convert equations between exponential and to logarithmic forms.
  10. Apply the rules of logarithms involving logarithms of products, quotients, powers, and change of base.
  11. Solve logarithmic and exponential equations, emphasis on using natural log and e.
  12. Solve applied problems such as applications of polynomial, rational, radical, exponential and logarithmic functions.
  13. Solve systems of equations, including linear and nonlinear systems.
- Evaluation of these learning outcomes done through assignments and tests.

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

There are prerequisite problems in WebAssign, the online homework system. Please complete the problems as soon as possible so you know if this course is right for you.

- **Online Homework (20%):** Each chapter has several online homework assignments in Web Assign. You should read the text section prior to attempting the homework. You may redo any of the online homework assignments until the due date to work towards 100% on the assignment. Each online homework assignment is 15 points. The due dates on the calendar and noted in WebAssign are the last date you may submit that online homework assignment, but do not wait until the due date to complete it. If you request an extension, a 20% penalty is applied to your assignment. Please note that there are worked examples and videos in WebAssign, and additional resources in EduCat to help you with the homework.
- **Class Discussions (10%):** There are six class discussions in EduCat. You are required to contribute to the class discussion. The discussion questions will help you solidify your knowledge of unit concepts. Once you post a response to the discussion question, you will see other students' responses (in 30 minutes) and must then provide a response to other students' postings according to the directions in the assignment (respond to one or two other students). Each class discussion is worth 10 points (5-6 points for your initial posting; 4-5 points for responses to other students' postings). I will grade you on the correctness and completeness of your initial posting and quality of your responses. Comments such as "good job" or "I agree" will not give you points toward responding to others' postings. Provide relevant or helpful feedback to your classmates.

#### **Interaction Expectations:**

The class discussion forums are important because they provide a means for you to interact with one another and with me on a regular basis (responses and replies to others). I will respond to your individual forum postings with feedback or helpful hints, especially if your initial posting is incorrect. The use of email and Zoom to get help on assignments provide additional means for you to interact with me.

- **Tests (50%):** There are five unit-tests in WebAssign. Each test consists of 20 questions and each one is 50 points. Please allow at least one hour in your schedule to take the test. Once you begin the test, you must finish it. There is only one opportunity to take the test. *Make-up tests are not given.* If you miss a test without notifying me in advance that you need additional time, I will email you to let you know you missed the test deadline and need to take it by the end of the day. However, a 10% penalty will be applied. If you still do not take the test, you will receive a score of 0. Your lowest test score will be replaced by half your raw score on the final exam as long as half your final exam score exceeds your lowest test score. So, a test score of 0 will be replaced by half your final exam (raw) score.

**Test Dates:** Feb 7, Feb 24, Mar 18, Apr 3, and Apr 16. You may take tests on the scheduled date or the test study day, which is the day before the scheduled date. If

you need to take the test outside of the scheduled day(s) due to a university approved excuse, please notify me prior to the test date to make arrangements.

- **Final Exam (20%):** The final exam is a **proctored**, comprehensive test that you will take in EduCat. The final exam consists of 25 questions and it is worth 100 points. The raw score of your final exam is calculated using your EduCat score (50%) and written work score (50%). Work must be shown on all problems. You may use an approved calculator and have a regular size sheet of paper (8.5" by 11") with any information you like on both sides of the paper.

You must complete the final exam survey in EduCat after you take the last test. You will tell me the day and time you want to take the final exam, the name of your proctor, their email address, and how you know the individual. No friends, relatives, roommates, or other students may proctor the final exam. In addition, on-campus students should not be asking another professor or their coach to proctor their exam. If you are on campus, please plan to come to my office to take the final exam. There are testing rooms available. If you need accommodations through Disability Services, please remember to schedule your final exam with their office.

The final exam is password protected so you must notify me of the day you wish to take it in the survey. That way, I can send the information to your proctor. Your proctor will be responsible for emailing me your written work using a PDF scanner that can be downloaded to their phone (e.g., TurboScan, Genius Scan, CamScanner). No photos please because they are often blurry or too small, which means I cannot read your work and give you credit.

### **Is there extra credit in the class?**

YES! I will add a percentage to your final course percentage at the end of the term. You may earn extra credit in the following ways.

- 1) Complete the final exam problems in WebAssign (parts 1 and 2). (up to 1%)
- 2) Complete the Final Exam Practice Test in EduCat. (up to 0.5%)
- 3) Complete the course evaluation at the end of the semester. At least 90% of the class must complete it in order to receive the extra credit. (0.5%)

**Grading Scale (%):** Your course grade will be weighted according to the percentages outlined under Assessment Format. Corresponding grades are below.

100 – 93.0: A	86.4 – 82.5: B	76.4 – 72.5: C	66.4 – 62.5: D
92.9 – 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

### **How much time should you spend each day on the class?**

You should set aside 2 – 3 hours each day to learn the concepts and complete the assignments. Follow the calendar to keep up with the work. Know the deadlines! You should plan for one hour to read each section in the text and view the worked examples. You will then likely spend 1 – 2 hours completing the homework.

**How do I get help in the class?**

- 1) Set up an appointment to meet with me in my office.
- 2) Use the “Ask your instructor” feature in WebAssign to ask about the questions you missed. I will receive an email when you use this feature and then I will go into WebAssign to look at your question. Please allow 24 hours for a response.
- 3) Go to the mathematics tutoring lab (Jamrich 2100); M-F 10:00 am – 6:00 pm.
- 4) Go to All Campus Tutoring (generally available on the weekends). Check their walk-in tutoring schedule at <https://www.nmu.edu/tutoring/>.

**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 Coordinators of Disability Services in the Dean of Students Office at 2001 C. B. Hedgcock Building (906-227-1737 or [disability@nmu.edu](mailto:disability@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.

**Email Etiquette Tips:**

Did you know NMU provides email etiquette tips at <https://www.nmu.edu/etrpc/email-etiquette>? Please be respectful in all your correspondence with me or other students. This includes email, postings made on Discussion Forums, or any other forms of communication. **Please tell me what class you are in when you email me.** Additional information about NMU’s expectations, acceptable standards of behavior, and procedures are in the Student Handbook at <https://www.nmu.edu/dso/studenthandbook>.

**Good Email Example:**

Hi Dr. Bell,

I am in your online MA111 class. I have a question on solving radical equations. Are you available to meet via Zoom on Wednesday between the hours of 5:00 pm and 8:00 pm. Thank you.

Your Name

**Need Technical Support?**

WebAssign Tech Support: 800-354-9706 or at [WebAssign Tech Support](#)  
NMU IT Services – <http://it.nmu.edu/helpdesk>

**NMU IT Support****NMU HelpDesk**

The HelpDesk is committed to providing the highest level of quality support to NMU students, faculty, and staff. Support is provided for NMU network connections, network services, and NMU issued software and computers, including TLC notebooks. Limited support for other systems may be provided or referred to other service providers on campus as available. Help is available via email, telephone, walk-in service and the IT/Helpdesk Web site.

- Location: LRC 116
- Phone: (906) 227-2468
- Email: [helpdesk@nmu.edu](mailto:helpdesk@nmu.edu)

**NMU Micro Repair**

Provides hardware support for NMU students, faculty, and staff.

- Location: LRC 114
- Phone: (906) 227-1192

Winter Class Semester Schedule of Assignments (PDF version available in EduCat)

Date	Read Section - Do Online HW	Notes	Online HW (WebAssign)	Online HW Due	Class Discussions	CD Due
1/13	P.3	Polynomials and Special Products	P.3	13-Jan		
1/14	P.4	Factoring Polynomials	P.4	14-Jan		
1/15	P.5	Rational Expressions	P.5	15-Jan		
1/16	P.6	Rectangular Coordinate System & Graphs	P.6	16-Jan		
1/17						
1/20	<b>No Classes</b>	<b>MLK Day</b>				
1/21	1.1	Graphs of Equations	HW01 1.1	21-Jan		
1/22	1.2	Linear Equations in One Variable	HW02 1.2	22-Jan		
1/23	1.3	Modeling with Linear Equations	HW04 1.3	23-Jan		
1/24						
1/27	1.4	Quadratic Equations & Applications	HW05 1.4	28-Jan		
1/28						
1/29	1.5	Complex Numbers	HW05 1.5	29-Jan		
1/30	1.6	Other Types of Equations	HW05 1.6	30-Jan	Discussion 1	
1/31					Discussion 1	
2/3	1.7	Linear Inequalities in One Variable	HW07 1.7	4-Feb	Discussion 1	3-Feb
2/4	1.8	Other Types of Inequalities	HW08 1.8	5-Feb		
2/5						
2/6	Review	Study day for test				
2/7	TEST 1	Chapter 1 (WebAssign)				
2/10	2.1	Linear Equations	HW09 2.1	10-Feb		
2/11	2.2	Functions	HW10 2.2	11-Feb		
2/12	2.3	Analyzing Graphs of Functions	HW11 2.3	12-Feb		
2/13	2.4	A Library of Parent Functions	HW12 2.4	13-Feb		
2/14					Discussion 2	
2/17	2.5	Transformations of Functions	HW13 2.5	17-Feb	Discussion 2	
2/18	2.6	Combining Functions: Composition	HW14 2.6	18-Feb	Discussion 2	18-Feb
2/19	2.7	Inverse Functions	HW15 2.7	20-Feb		
2/20						
2/21	Review	Study day for test				
2/24	TEST 2	Chapter 2 (WebAssign)				
2/25	5.1	Exponential Functions and Their Graphs	HW16 5.1	25-Feb		
2/26						
2/27	5.2	Logarithmic Functions and Their Graphs	HW17 5.2	27-Feb		
2/28						
3/3 - 3/7	<b>No Classes</b>	<b>Spring Break</b>				
3/10	5.3	Properties of Logarithms	HW18 5.3	10-Mar	Discussion 3	
3/11	5.4	Exponential and Logarithmic Equations	HW19 5.4	12-Mar	Discussion 3	
3/12					Discussion 3	
3/13	5.5	Exponential and Logarithmic Models	HW20 5.5	14-Mar	Discussion 3	13-Mar
3/14						
3/17	Review	Study day for test				
3/18	TEST 3	Chapter 5 (WebAssign)				
3/19	3.1	Quadratic Functions & Models	HW21 3.1	19-Mar		
3/20	3.2	Polynomial Functions of Higher Degree	HW22 3.2	20-Mar		
3/21	3.3	Polynomial and Synthetic Division	HW23 3.3	21-Mar		
3/24	3.4	Zeros of Polynomial Functions	HW24 3.4	25-Mar	Discussion 4	
3/25					Discussion 4	
3/26	3.5	Mathematical Modeling and Variation	HW25 3.5	27-Mar	Discussion 4	26-Mar
3/27						
3/28	4.1	Rational Functions and Asymptotes	HW26 4.1	28-Mar	Discussion 5	
3/31	4.2	Graphs of Rational Functions	HW27 4.2	1-Apr	Discussion 5	
4/1					Discussion 5	1-Apr
4/2	Review	Study day for test				
4/3	TEST 4	Chapters 3 & 4.1-4.2 (WebAssign)				
4/4	9.1	Linear and Nonlinear Systems	HW28 9.1	4-Apr		
4/7	9.2	Two-Variable Linear Systems	HW29 9.2	8-Apr	Discussion 6	
4/8					Discussion 6	
4/9	9.3	Multivariable Linear Systems	HW30 9.3	10-Apr	Discussion 6	9-Apr
4/10						
4/11						
4/14	9.5	Systems of Inequalities	HW31 9.5	14-Apr		
4/15	Review	Study day for test				
4/16	TEST 5	Chapters 9 (WebAssign)				
4/17		Final Exam Survey in EduCat Due		17-Apr		
4/18						
4/21	Review	Final Exam Review Part 1 (Extra Credit)	50 problems	22-Apr		
4/22	Review					
4/23	Review	Final Exam Review Part 2 (Extra Credit)	50 problems	24-Apr		
4/24	Review					
4/25	Review					
TBA		Final Exam in EduCat (2 hours for test) - proctor required				