



Ma 111  
**College Algebra**

2024-25 Second Semester

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**INSTRUCTOR INFORMATION**

Section: Ma 111  
Time/Room: MTWF 10:00-10:50A.M., AI 314  
Instructor: Mr. Charles Lacey  
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**COURSE INFORMATION**

**Catalog Description**

Review of elementary algebra. Stress on the concept of relation and function, algebraic functions, and their graphs. 3 credits/3 load/4 class-meetings per week

**Prerequisite**

ACT score of 20–25, SAT score of 550–630, completion of STEM modules (090), or placement test

**Textbook and Technology Requirements**

- Textbook (required): Aufmann and Nation. *Algebra and Trigonometry*. 8th ed., Cengage, 2015. ISBN 978-1-285-44942-5
- Graphing Calculator (required): TI–83/84 is sufficient. (Note: Certain majors and almost all upper-level Ma courses require a TI-NSpire CAS or TI-89.)

**COURSE CONTEXT**

**Institutional Context**

This course supports the following goals of the institutional (IG), the BJU core (BJ), and the Division of Mathematical Science (MS):

- IG 3: To develop in students Christ-like character through disciplined, Spirit-filled living.
- IG 4: To direct students toward a biblical life view that integrates God’s Truth into practical Christian living.
- IG 5: To prepare students to excel intellectually and vocationally by offering diverse academic programs rooted in biblical truth and centered on a liberal arts core.
- BJ 3c: Will equip students to understand the physical world as God’s creation, as stewardship given to man, and as the physical expression of His glory

- BJ 4: Demonstrate critical thinking in analyzing, evaluating, and synthesizing information and ideas.
- BJ 5: Develop solutions to exercises, working independently, and with others, through critical and creative thinking.
- MS 5: Construct a foundation upon which they, after graduation, can continue the development of their God-given abilities and the learning necessary for their work and life.

### **Course Goals**

This course is designed to

- CG 1: Ensure that students have the mathematical skills needed to be successful in everyday life. (IG 4, 5)
- CG 2: Demonstrate mathematics as a tool to analyze the order and design in the world around us. (BJ 3c)
- CG 3: Develop character traits such as self-discipline, organization, perseverance, and precision. (IG 3)
- CG 4: Develop sound thinking and reasoning skills. (BJ 4, 5)
- CG 5: Mature the student in the theory and application of mathematics. (MS 1)
- CG 6: Provide a foundation for other mathematics, science, or computer courses. (MS 5)

### **Course Objectives**

	The students will be able to...	Course Goals	Course Content	Assessment
1.	Perform operations on polynomials	3, 5, 6	Unit 1a	HW, Quiz
2.	Factor polynomials	3, 4, 5, 6	Unit 1a	HW, Quiz
3.	Perform operations on rational numbers and expressions	1, 3, 5, 6	Unit 1a	HW, Quiz
4.	Solve linear equations and absolute value equations	1, 3, 5, 6	Unit 1a	HW, Test
5.	Perform operations on the set of complex numbers	2, 3, 5, 6	Unit 1b	HW, Quiz
6.	Solve quadratic equations	3, 5, 6	Unit 1b	HW, Test
7.	Derive the quadratic formula	4, 5, 6	Unit 1b	HW, Quiz
8.	Solve applications using linear and quadratic equations	1, 2, 4, 6	Units 1a, 1b	HW, Test
9.	Solve rational and radical equations	3, 5, 6	Unit 1b	HW, Test
10.	Solve inequalities	1, 3, 5, 6	Unit 1b	HW, Test
11.	Write and solve equations of variations and apply them to real-life settings	1, 2, 4, 6	Unit 1b	HW, Portfolio
12.	Use the Cartesian coordinate system and graph the basic family of functions	5, 6	Unit 2	HW, Quiz
13.	Derive the distance formula	4, 5, 6	Unit 2	HW, Quiz
14.	Apply the basic properties of functions to determine the shapes of graphs	4, 5, 6	Unit 2	HW, Quiz
15.	Use linear and quadratic functions to model real-life applications	2, 4, 6	Unit 2	HW, Portfolio
16.	Prove the Remainder Theorem and the Factor Theorem	3, 4, 5	Unit 3	HW, Quiz

17.	Use the Rational Zeros Theorem	3, 4, 5	Unit 3	HW, Test
18.	Use the theorems in Objectives 16 and 17 along with synthetic division and other tools to help factor polynomials	3, 4, 5	Unit 3	HW, Test
19.	Apply the theorems in Objectives 16 and 17 to help identify the asymptotes of rational functions and graph rational functions	3, 4, 5	Unit 3	HW, Test
20.	Describe characteristics of relations, functions, and inverse functions	1, 3, 6	Unit 4	HW, Quiz
21.	Derive inverse functions for one-to-one functions including exponential and logarithmic functions	3, 4, 5	Unit 4	HW, Test
22.	Evaluate exponential and logarithmic expressions	1, 6	Unit 4	HW, Quiz
23.	Use exponential and logarithmic functions to model real-life applications	2, 4, 6	Unit 4	HW, Portfolio
24.	Solve exponential and logarithmic equations	3, 4, 5, 6	Unit 4	HW, Test
25.	Defend or refute different viewpoints on the interconnections among mathematics, reality, philosophy, and world view.	2, 3, 4		Discussion Posts

## COURSE ASSESSMENT AND GRADING

### Activities and Assessment

The course grade will be based on performance in the following activities.

<b>Category</b>	<b>Grade</b>	<b>Description</b>
Homework	3 x 10 pts	<ul style="list-style-type: none"><li>• Out-of-class exercises for each textbook section covered are due at the beginning of each chapter test.</li></ul>
HW Quizzes	5 x 10 pts	<ul style="list-style-type: none"><li>• HW Quizzes will be given at the beginning of class on Friday. Quizzes will consist of HW exercises, and a report of problems completed, graded, and corrected that week. (10 pts)</li></ul>
Writing	≈10 pts	<ul style="list-style-type: none"><li>• Discussion Boards: Read-post-respond discussions focusing on viewpoints of mathematics (5 pts)</li></ul>
Quizzes	≈200 pts	<ul style="list-style-type: none"><li>• Unit Quizzes: In-class, closed-book, quizzes from Chapters P, 1, 2, 3, &amp; 4. (5 quizzes, 20-50 pts each)</li><li>• Theory Quizzes: In-class, closed-book, 15-minute quizzes focusing on theory for Chapters 1, 2, &amp; 3 (3 quizzes, 10-15 pts each)</li><li>• Pop Quizzes: In-class quizzes (≈5 pts each)</li></ul>
Applied Take-Homes	3 x 20-30 pts	<ul style="list-style-type: none"><li>• Out-of-class individual assignments covering applied skills from chapters 1, 2, &amp; 3.</li></ul>
Tests	3 x 100 pts	<ul style="list-style-type: none"><li>• In-class, closed-book, 50-minute tests focusing on higher-skills and applications for chapters 1, 2, &amp; 3.</li></ul>
Final Exam	1 x 150 pts	<ul style="list-style-type: none"><li>• In-class, closed-book, multiple-choice, cumulative, 70-minute exam focusing on higher-order skills, theory, and application.</li></ul>
Factoring	1 x 90 pts	<ul style="list-style-type: none"><li>• Failure to achieve an 80% or higher on the Factoring Quiz by the 12th week of class will result in a 0 for this assignment.</li></ul>

### Homework

Because homework is one of the primary means by which students develop good mathematical habits, it is crucial to success in this course.

- Homework must be neat and well organized. Section numbers and page numbers should appear at the beginning of each new section.
- Homework should be worked out in detail. Answers alone are not acceptable and will receive no credit.
- Exercises should be worked going down the page, never across.
- The student is responsible for checking the answers to all homework before turning in the assignment. Answers to odd-numbered exercises are in the back of the book. Answers to assigned even-numbered exercises are available on Canvas.
- Homework questions will be addressed at the discretion of the teacher, so be prepared to ask questions each class day. Homework will be collected as indicated in the assignment schedule. One of the keys to success in this course is to stay on schedule and to always be prepared.

### **Friday Homework Quizzes**

Homework will be evaluated most Fridays (unless there's another assessment) in the form of an in-class quiz during the first 10 minutes of class. The quiz will consist of 3 homework exercises as well as the numerical report of exercises personally completed, graded, and corrected if incorrect.

### **Discussion Boards (DB)**

Discussion Board activities will be assigned in Canvas. These assignments will engage students in topics such as their personal math biography, a biblical worldview of mathematics, the history of math, and self-analysis of math skills. The goal of these assignments is to help students develop and articulate their view of how math fits into God's world in general and their lives specifically.

### **Late or Missing Assignments**

- Students are expected to turn in assignments on time. Missing work will be given a grade of 0.
- Homework Quizzes will not be accepted late or made-up.
- Missed chapter test and quizzes may be made up with the instructor's approval in extreme circumstances.

### **Grading Scheme**

Final grades will be assigned according to a standard 10 percentage point scale calculated out of the total points available during the semester (≈900 pts). Percentages will be rounded to the nearest whole percentage when determining final grades.

### **Presentation Standards**

The goal is to develop a professional level of understanding of the course material. Students are expected to submit work that is professional, fluent, and clearly communicated.

- Tests/Quizzes/Assignments are not about what you know, but about what you can communicate about what you know – so the presentation of your work/logic should always be neat, orderly, clearly defined.
- Answers are to be presented as the logical conclusion of your work.
- Papers should not be submitted with “spiral”/ripped edges (clean edges are professional).
- Take-home tests (when time is not limited) should be neatly presented (rewritten, organized neatly, no scratchwork, just a final polished presentation)
- Solutions that are not professionally presented will be penalized 10 percent.

### **Classroom Decorum**

The classroom is a professional environment. Students are expected to be respectful to their instructor and peers in behavior, attitude, attire, and use of technology. The instructor has the right to require students who are participating in distracting behavior to leave the class.

## **Attendance**

- Students should notify the instructor by email as soon as possible after an absence (preferably within 24 hours).
- If the absence is planned, the student should notify the instructor before missing class.
- Absent students are personally responsible to obtain notes from classmates.
- BJU attendance policy is in effect (see <https://home.bju.edu/bju-policies/> for details).

## **Academic Honesty and Integrity Policy**

Doing your own work brings glory to God. The claiming of someone else's work as your own is cheating and is a sin. All work done for this class needs to be your own. If information is taken from other sources, it always needs to be referenced and credit given where it is due. Since the goal of the assignments in this course is to learn to develop the skills covered NOT complete the tasks assigned, and since the use of AI to complete or jumpstart tasks defeats the goal of the assignments, you may not use generative AI tools (i.e. Chat GPT, Bing Chat, Google Bard, etc.) in this course for any assignment without the professors express permission. Should an AI tool be used with permission, its use must be documented. I value academic integrity. Therefore, I will take appropriate action if cheating or plagiarism occurs in this course. For additional information, please see the current Bob Jones University Student Handbook.

BJU's **academic honesty and integrity** policy is in effect (see <https://home.bju.edu/bju-policies/> for details).

## **Copyright Policy**

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# Ma 111 – Tentative Course Schedule

Date	Day	Class	Items Due
Jan. 15	W	P.1, P.2	
Jan. 17	F	P.3, P.4	HW Quiz
Jan. 20	M	MLK Jr. Day	
Jan. 21	T	P.4, P.5	
Jan. 22	W	1.1	
Jan. 24	F	Review, Chp P Quiz*	
Jan. 27	M	1.1, 1.2	
Jan. 28	T	1.2	DB 1
Jan. 29	W	P.6, 1.3	
Jan. 31	F	1.3	HW Quiz
Feb. 3	M	1.4	
Feb. 4	T	1.4	
Feb. 5	W	1.5	
Feb. 7	F	Review, Chp 1 Quiz (1.1-1.4)	
Feb. 10	M	1.6	
Feb. 11	T	Catch-Up	
Feb. 12	W	Review, Chp 1 Theory Quiz	
Feb. 14	F	Chp 1 Test	Chp 1 - HW Due
Feb. 17	M	2.1	
Feb. 18	T	2.2	Chp 1 Applied Take-Home Due
<b>Bible Conference: February 18-21</b>			
Feb. 24	M	2.2, 2.3	
Feb. 25	T	2.3	
Feb. 26	W	2.4	
Feb. 28	F	Review, Chp 2 Quiz	
Mar. 3	M	2.4	
Mar. 4	T	2.4, 2.5	
Mar. 5	W	2.5, 2.6	
Mar. 7	F	Catch-Up, Factoring Quiz	
Mar. 10	M	Review, Chp 2 Theory Quiz	
Mar. 11	T	Chp 2 Test	Chp 2 - HW Due
Mar. 12	W	3.1	
Mar. 14	F	3.1	HW Quiz; Chp 2 Applied Take-Home Due
Mar. 17	M	3.2	
Mar. 18	T	3.2	
Mar. 19	W	3.3	
Mar. 21	F	3.3	HW Quiz
<b>Spring Break: March 24-28</b>			
Mar. 31	M	Review, Chp 3 Quiz	
Apr. 1	T	3.4	
Apr. 2	W	3.4	DB 2
Apr. 4	F	3.5	HW Quiz
Apr. 7	M	3.5	
Apr. 8	T	Catch-Up	
Apr. 9	W	University Service Day – No Class	
Apr. 11	F	Review, Chp 3 Theory Quiz	Factoring Quiz Deadline
Apr. 14	M	Chp 3 Test	Chp 3 - HW Due
Apr. 15	T	4.1	
Apr. 16	W	4.1	Chp 3 Applied Take-Home Due
Apr. 18	F	4.2	HW Quiz
Apr. 21	M	4.2	
Apr. 22	T	4.3	
Apr. 23	W	4.4	
Apr. 25	F	4.5	HW Quiz
Apr. 28	M	4.6	
Apr. 29	T	Chp 4 Quiz	
Apr. 30	W	Review	
May 2	F	Review	

Ma 111 - Final Exam - Tuesday, May 6th @ 9:30-10:40 a.m.

\*In-Class Assessment:  $\geq 50$  pts,  $< 50$  pts

MA 111 Homework Exercises  
*Algebra and Trigonometry*, Aufmann and Nation, 8<sup>th</sup> Edition

**CHAPTER P**

- Section P.1 7, 9, 14, 15–23 odd; 27–33 odd; 41–47 odd, 53, 59, 61, 65, 67, 73, 78, 81, 87, 90, 91, 113–120 all, 123–127 odd [38 exercises]
- Section P.2 1, 5, 9–17 odd, 21, 23, 27, 33, 39, 45, 49–55 odd, 65, 71, 74, 79, 84, 85, 89, 92, 97, 103, 105, 109, 113, 119, 125, 127, 131, 135 [35 exercises]
- Section P.3 21–43 odd, 47, 49, 55, 59, 63, 65, 69, 77–89 odd [26 exercises]
- Section P.4 13–29 odd, 35, 40–106 every third exercise (beginning with 40 and ending with 106) [33 exercises]
- Section P.5 13, 17, 21, 24–30 even, 33, 39–45 odd, 49, 55, 57, 60, 63, 65, 71b, 72b [20 exercises]
- Section P.6 9, 13, 17, 19, 23, 27, 31, 37–41 odd, 44, 45, 49, 55, 60, 61, 63, 67, 70 [18 exercises]

**CHAPTER 1**

- Section 1.1 5, 9, 13, 17, 21–49 odd, 53, 55, 56, 57 [23 exercises]
- Section 1.2 7–16, 17–23 odd, 27–65 odd [34 exercises]
- Section 1.3 7, 9, 11, 17, 19, 31, 33, 35, 44, 47, 51, 55, 63, 73, 75, 86, 87, 89, 90, 95, 97 [21 exercises]
- Section 1.4 7, 13, 15, 17, 23, 29, 31, 34, 39, 41, 43, 45, 49, 55, 59, 69, 71–79 odd, 82 [22 exercises]
- Section 1.5 5, 11–25 odd, 31, 33, 39, 45, 51, 55, 57, 59, 60, 63, 64, 66, 69, 73 [23 exercises]
- Section 1.6 1–11, 13–21 odd, 24, 27, 31, 33, 35, 38, 40 [23 exercises]

**CHAPTER 2**

- Section 2.1 1, 3, 9, 15, 19, 22, 23, 27, 31, 35, 36, 41, 43, 45, 48, 51, 87 [17 exercises]
- Section 2.2 1, 3, 4, 11, 15, 19, 23, 25, 27, 31, 33, 39, 45, 47, 51, 54, 64, 69, 73, 77, 79, 89, 91, 96, 97, 100, 108, 119, 121 [29 exercises]
- Section 2.3 11, 13, 17, 21, 25, 27, 33, 36, 39, 45, 49, 53–57 all, 65, 66, 72, 75, 77, 83, 85, 89 [24 exercises]
- Section 2.4 1–8, 11, 17, 21–25 odd, 33, 39, 42, 48, 50–52, 57–63 odd, 66, 67, 69, 70 [28 exercises]
- Section 2.5 5–17 odd, 21, 24, 25, 29, 33, 49, 52, 53, 55, 59, 62, 71 [19 exercises]
- Section 2.6 7, 10, 13, 21–43 odd, 47, 51, 56, 59, 63, 75, 80, 82, 85, 87 [25 exercises]

**CHAPTER 3**

- Section 3.1 7, 13, 15, 19, 22, 23, 29, 33, 38, 39, 45, 47, 49, 53, 57, 59, 61, 64, 67, 68, 71, 73 [22 exercises]
- Section 3.2 5–13 odd, 14, 15, 23–29 odd, 35, 37, 41, 47, 55, 57, 61, 63, 65, 68, 69 [22 exercises]
- Section 3.3 5–15 odd, 33–39, odd, 45, 49, 58, 65, 71, 72, 76 [17 exercises]
- Section 3.4 5, 9, 17, 21, 25, 36, 43, 50, 59, 65 [10 exercises]
- Section 3.5 3–7 odd, 13, 14, 18, 23–27 odd, 33, 36, 48, 51, 53, 55, 59, 67, 78, 83, 85 [20 exercises]

**CHAPTER 4**

- Section 4.1 5, 7, 9–13, 15, 17, 23–27 odd, 31, 35, 41, 45, 49, 55, 59 [23 exercises]
- Section 4.2 5–13 odd, 19–29 odd, 33–37 odd, 49, 52, 58 [17 exercises]
- Section 4.3 5–25 odd, 29, 31, 35, 37, 43, 45, 49, 51, 55, 59, 61, 65, 69, 71, 77 [26 exercises]
- Section 4.4 5, 9–17 odd, 21–27 odd, 31, 35, 37, 39, 43, 57–62 all, 67, 71, 73, 76 [25 exercises]