

Ma 111
College Algebra
2025-26 Second Semester

INSTRUCTOR INFORMATION

Section: Ma 111, sec 1 Time/Room: MTWF 2:00-2:50 pm, Alumni 314
Instructor: Mrs. Donna Lawrence Office: Alumni 86
Email: dflawren@bju.edu Office Hours: MTWF 1:00

Students needing help are also encouraged to visit the Math Center in MB 201. Help there is a free service, and the center is available most if not all of the hours that the library is open. I am there MWF at 9 and 3 and would be glad to offer help also. (My Ma 080 and 090 students have priority those hours, of course.) We have solutions manuals on hand for the homework for this course if needed.

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 20-25, SAT 520-600, CLT 18-24, completion of Ma 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
- Students who are not going on to Trigonometry could use Aufmann and Nation. *College Algebra*. 8th ed., Cengage, 2025. ISBN 978-1-285-43477-3
- 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 institution (IG), the BJU core (BJ), and the Division of Mathematical Sciences (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 centers 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 1: Mature the student in the theory and applications of mathematics and computer science.
- 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
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
16.	Prove the Remainder Theorem and the Factor Theorem	3, 4, 5	Unit 3	HW, Quiz
17.	Describe characteristics of relations, functions, and inverse functions in general and as applied to exponential and logarithmic functions.	3, 5, 6	Unit 4	HW
18.	Evaluate exponential and logarithmic expressions.	4, 5, 6	Unit 4	HW, Quiz

COURSE ASSESSMENT AND GRADING

Activities and Assessment

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

Category	Grade	Description
HW Reflections	5 x 13 pts: (65) <i>lowest dropped</i>	HW Reflections will be due in Canvas every Monday before class begins. Students will self-report what percent of the HW assigned that week that they completed, checked, and corrected if needed. They will also include a brief reflection on what they have learned and need to improve upon.
Writing	4 x 5 pts: (20)	Discussion Boards: Read – post – respond discussion focusing on viewpoints of mathematics. Assigned in Canvas. (5 pts each)
Quizzes	205 pts	Unit Quizzes: In-class, closed-book quizzes from Chapters P, 1, 2, 3, & 4 (5 quizzes, 20-50 pts each) Theory Quizzes: In-class, closed-book, 15-minute quizzes focusing on theory for Chapters 1-3 (3 quizzes, 15 pts each)
Applied Take-Homes	2 x 30 pts (60)	Out-of-class individual assignments covering applied skills from chapters 1-2
Tests	3 x 100 pts (300)	In-class, closed-book, 50-minute tests focusing on higher skills and applications for chapters 1-3
Final Exam	1 x 150 pts	In-class, closed-book, multiple-choice, cumulative, 70-minute exam focusing on higher-order skills, theory, and application
Factoring Quiz		Failure to achieve an 80% or higher on the Factoring Quiz by the 12 th week of class will result in the loss of a letter grade.
Total Points	800	

Course Evaluation

All course/assignment grades are based on the evaluation of the work communicated by the student. Unclear or incomplete communication of the solutions, which includes the process, may result in a penalty at the professor's discretion.

Letter grades will be based on a standard 10-point scale

Presentation of Work

The goal is professional, fluent, and clear communication of what you know.

- PW 1. Proper use of mathematical notation is expected. The structure of notation conveys specific meaning and should be used appropriately.
- PW 2. Mathematical presentation is like grammar. There are subjects, verbs (=, ≤, >, etc.), and objects. Always write in “complete sentences.”
- PW 3. Tests/presentations/projects 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, and with the appropriate amount of supporting detail. (Excessive steps are not required; however, answers alone are not (usually) acceptable.)
- PW 4. Always work down the page. (Working in multiple columns is generally not acceptable.) There should be one problem worked in each “row” because this contributes to clarity and the development of your logical argument.
- PW 5. Skip lines between problems. If you have dense handwriting, skip every other line and skip 2-3 lines between problems.
- PW 6. Clearly label problems/sub-problems. Problems do not necessarily have to be worked in order but must be clearly labeled either way. Your professor will communicate their expectation on presenting problems out of order.
- PW 7. Answers are to be presented as the logical conclusion of your work, not as the only important thing (e.g. at the start of the problem and/or unconnected with any justifying work).
- PW 8. Work should be submitted on clean 8.5× 11 inch (standard-size) paper and should not be submitted with “spiral”/ripped edges.
- PW 9. Take-home tests (when time is not limited) should be neatly presented (rewritten, organized, no scratchwork, etc.) as a final polished piece.

Your professor may refuse to accept work that does not meet the minimum presentation requirements above, or they may choose to deduct up to 10% from the assignment.

Problems Expectations

The goal is to prove your mastery (not your just barely comprehending).

- PE 1. Read all words carefully in a question. Everything is important, so know what the meanings of all words are and how those words tell you to respond.
- PE 2. Theory is a precise expression of important ideas. While it is not graded word for word, jot for jot, the precise ideas must be maintained. Embrace thorough, smooth learning and presentation. Can you recite the theory from the last class period quickly, comfortably, and conversationally?
- PE 3. Theory tells us how to solve problems. Know exactly what problems connected to each theorem or definition look like and know how to solve them.

PE 4. Know what the key steps of each problem are. Present only the key steps (or the minimum needed to get the answer right and show all your logic).

PE 5. Do enough practice for each type of problem so that you are smooth.

Failure to meet these expectations will be reflected in lower test scores.

Late Policy (100-200 level courses)

Assignments not submitted as directed by the due date will incur the following late penalty.

- No late homework/in-class assignments are accepted.
- Written assignments/projects/take-home tests are penalized at 10% per day for the first three days and a grade of 0% after that. Late paper submissions must include the date and time the paper is submitted and be in the credenza by 8am the next day. The next day penalty begins at 8am.
- In-class tests must be taken by the date given in class unless there is incapacitating illness (see attendance policy below). Missing a test/taking the test late (including an oral exam) will result in a 10% penalty unless excused by the professor. Tests should be made up prior to the next class period unless other arrangements have been made with the professor.
- Work may always be completed early. Contact your professor if you wish to take a test early.

CLASS POLICIES

Department

Compliance with student handbook policies is expected during class. The classroom is to be a professional environment. That means you are to come to class prepared for the day's discussion, your attention is expected to be on course related material, and you are expected to positively contribute to the class.

Emergencies During Class

In case of emergency requiring evacuation, students will go down the stairs on the fountain side and exit the door facing Wade Hampton underneath the stairs. Students will immediately cross the street and gather by the fence with their class. If we are unable to exit the building, the professor will instruct the students on the best course of action. To be able to respond quickly to external threats, professors may keep classroom doors locked. If you are late arriving to class, you may need to knock on the door and be let in.

Absences

BJU attendance policy is in effect (see <https://home.bju.edu/bju-policies/> for details).

- Scheduled tests/quizzes should be taken before a planned absence; please contact your professor to make arrangements for doing so. You are personally responsible for getting notes from your classmates and discussing the missed material with them. You should not expect your professor to privately re-teach you the material you missed. Your professor is always available to help you with specific questions. Work may always be completed early (see your professor if you wish to take a test early).

- Missing an in-class test because you feel you are not prepared to take it is not acceptable. Work missed for this reason will not be made up and you will receive a zero on the assignment.
- For absences due to incapacitating illness or emergency, you should contact the instructor as soon as you realize you will not be in class to make arrangements to make up any missed work. Tests will be made up without penalty for the first occurrence. Each subsequent time a test is missed because of incapacitating illness or emergency, an additional 10% grade penalty for that test will be incurred. A 10% penalty will be assessed for a late submission of take-home tests. All late work must be made up by the next class period unless other arrangements have been made with the professor.

Academic Integrity Policies:

University academic integrity policy is in effect (see <https://home.bju.edu/bju-policies/> for additional details).

Definitions of Integrity Violations

Integrity is the reflection of the character and nature of God in our actions; therefore, students will be expected to work with integrity. In academia, violations of integrity generally fall into one or more of the following categories:

- *Cheating*: unauthorized use or attempted use of assistance, information, or aids in any academic assignment
- *Falsification*: submitting work done by others, changing work after submitting an assignment, reporting false information about the completion of an assignment
- *Unacceptable collaboration*: working with others when not permitted, using AI to generate ideas, thoughts, or content without the explicit permission of the professor
- *Facilitation of Cheating*: helping another student violate academic integrity, communicating quiz/test questions to other students
- *Plagiarism*: the intentional or unintentional use to any degree of the ideas or words of one's source material without proper acknowledgement

All work done for this class must represent your own efforts, your own understanding, and your own communication of the material.

Course Integrity Policies

If information is taken from other sources (which is at times appropriate), it always needs to be referenced and credit given where it is due. Use standard referencing techniques as taught in En 102. Solutions found on the internet are not to be copied.

- Homework: While you are encouraged to work together on homework assignments, simply copying someone else's solution is neither useful nor acceptable. Your homework should represent your work and your understanding of the work.
- Tests (In-Class and Take-Home): No resources may be used while taking the test unless permitted by the professor. The presence of any unauthorized material on your desk, in your calculator, on your laptop, etc. while taking a test will be construed as cheating and will be dealt with as such.

Internet/AI enabled devices or any communication devices (including but not limited to smart glasses, watches, earbuds, etc.) are not permitted to be used and

should be stored out of sight during the testing period. Access these type of devices during the test will be construed as cheating and will be dealt with as such.

Cheating on a test will likely result in a zero on the test and will be submitted to the Academic Integrity Committee.

Assignment submissions will be evaluated for plagiarism and AI usage at the discretion of the professor. If you have a question about any source you are considering using, it is wise to gain your professor's approval before using it. You are always permitted to ask your professor for help. Any help they choose to provide is acceptable.

AI Usage Policy

The goal of the assignments in this course is to learn to develop the skills covered, NOT to complete the tasks assigned. The use of AI to complete or jumpstart tasks defeats the goal of the assignments. Therefore, you may not use generative AI tools in this course for any assignment without the professor's express permission. AI tools include, but are not limited to, CoPilot, Apple Intelligence, Chat GPT, Bing Chat, Google Bard, Grok, Deepseek, Grammarly, and language translators.

Documentation of Permitted AI Use

Should an AI tool be used with permission, its use must be documented (including the tool used, a summary of the prompts provided and the portions of the assignment that were based on AI generated work). See <https://style.mla.org/citing-generative-ai/> for details on citing the use of AI.

Copyright Policy

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Ma 111 Tentative Schedule

Date	Day	Class	Items Due
Jan 14	W	Introduction, P.1	
Jan 16	F	P.1, P.2	
Jan 19	M	<i>MLK Day, no class</i>	
Jan 20	T	P.2, P.3	HW Reflection in Canvas (Due <i>Tuesday</i> before class – 5 pts)
Jan 21	W	P.4	
Jan 23	F	P.5	
Jan 26	M	Catch up, Factoring Quiz	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Jan 27	T	Review, Ch P Quiz (50 pts)	Discussion Board 1 due (5 pts)
Jan 28	W	1.1	
Jan 30	F	1.2	
Feb 2	M	1.2	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Feb 3	T	P.6, 1.3	
Feb 4	W	1.3	
Feb 6	F	1.4	
Feb 9	M	Review, Ch 1 Quiz (20 pts)	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Feb 10	T	1.4	
Feb 11	W	1.5	
Feb 13	F	1.6	
Feb 16	M	Review, Ch 1 Theory Quiz (15 pts)	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Feb 17	T	Ch 1 Test (100 pts)	
Feb 18-20	F	<i>Bible Conference, no class</i>	
Feb 23	M	2.1, 2.2	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Feb 24	T	2.2, 2.3	Ch 1 Applied Take-Home Due (30 pts)
Feb 25	W	2.3	
Feb 27	F	2.4	
Mar 2	M	Review, Ch 2 Quiz (20 pts)	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Mar 3	T	2.4, 2.5	Discussion Board 2 due (5 pts)
Mar 4	W	2.5, 2.6	
Mar 6	F	Catch-up	
Mar 9	M	Review, Ch 2 Theory Quiz (10 pts)	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Mar 10	T	Ch 2 Test (100 pts)	
Mar 11	W	3.1	
Mar 13	F	3.1	
Mar 16	M	3.2	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Mar 17	T	3.2	Ch 2 Applied Take-Home Due (20 pts)
Mar 18	W	3.3	
Mar 20	F	3.3	
Mar 23-27	M-F	<i>Spring Break, no class</i>	
Mar 30	M	3.4	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Mar 31	T	Review, Ch 3 Quiz (20 pts)	Discussion Board 3 due (5 pts)
Apr 1	W	3.4	
Apr 3	F	3.5	
Apr 6	M	3.5	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Apr 7	T	Catch-up	
Apr 8	W	Review, Ch 3 Theory Quiz (15 pts)	
Apr 10	F	Ch 3 Test (100 pts)	
Apr 13	M	4.1	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Apr 14	T	4.1	Factoring Quiz Deadline
Apr 15	W	<i>AACS Service Day, no class</i>	
Apr 17	F	4.2	
Apr 20	M	4.2	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Apr 21	T	4.3	Discussion Board 4 due (5 pts)
Apr 22	W	4.4	
Apr 24	F	4.5	
Apr 27	M	4.6	HW Reflection in Canvas (Due <i>Monday</i> before class – 5 pts)
Apr 28	T	Ch 4 Quiz (50 pts)	
Apr 29	W	Review	
May 1	F	Review	
May 6	W	<i>Final Exam, 3:30 – 4:40</i>	

MA 111 Homework Exercises

Algebra and Trigonometry, Aufmann and Nation, 8th 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]

Section 4.5 5, 9, 13, 19, 25, 27, 39 [7 exercises]

Section 4.6 5, 7, 9, 11b-d [4 exercises]