BOB JONES UNIVERSITY
Build Faith. Challenge Potential. Follow Christ.

College of Arts and Science

MA 108
Foundations of Mathematics for Teachers
2025–26 Second Semester

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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.

Welcome, future Christian teachers! I hope that this course will give you the foundation and skills that you need to approach teaching math to your future students with confidence and enthusiasm, inspiring them to view the subject with confidence and enthusiasm as well!

Course Description

This course will give you an overview of mathematics properties, processes, and symbols used by teachers on the elementary/middle school level. Some topics covered will be problem solving and reasoning, sets, number theory, ratios and proportions, and the real number system.

Course Readings

Mathematics for Elementary School Teachers, Ricardo D. Fierro. 1st Edition. Cengage Learning.

Context

The faculty of the Division of Mathematical Sciences has developed five broad goals and has aligned these goals with the Bob Jones University Institutional Goals (IG) and the goals of the BJU Core (BJUC). We believe these goals support the IG/BJUC of the University. The Division Goals (DG) are designed to develop each student to:

1. Understand the essential theory of mathematics/computer science and appropriately apply the theory in solving problems.
2. Use critical thinking/analytical skills.
3. Understand mathematical/computing problems and design solutions with the aid of appropriate tools.
4. Apply an understanding of how mathematics/computing can be used in service to Christ as tools to the examination of the world He created.
5. Construct a foundation upon which they, after graduation, can continue the development of their God-given abilities and the learning necessary for his work and life.

Because this course is required by the Education department for several of its majors, it also supports the following Education Department goals (EG):

The student will …

1. Demonstrate a knowledge of content and pedagogy to be effective teachers.
2. Create short- and long-range plans that consider the needs of diverse learners using a variety of instructional strategies and appropriate assessments.
3. Demonstrate the ability to have a positive effect on student learning.

Course Goals (CG)

In this course, I will attempt to teach future teachers to…

1. Know that which they will teach. Therefore each student must be able to identify geometric shapes, find basic measurements related to geometric shapes, understand the meaning of motion transformational geometry, use functions and basic algebra, and develop an understanding of probability theory and statistics. (DG 1, 2, 5 and EG 1)
2. Be able to communicate the meaning of elementary/middle school level mathematics so that their students can learn with understanding. (DG 3, 5 and EG 3)
3. Develop a love of mathematics in its consistency and accuracy which point to our Great Creator. (DG 3, 4 and EG 3)
4. Work in collaboration with others. (DG 4, 5)

Course Objectives

Some of the specific skills I hope you will obtain in this course are listed below. Upon completion of this course, you should be able to …

1. Understand the meaning and use of variables and use them to describe a problem or pattern by formulating algebraic expressions. Solve equations and interpret the solutions. (CG 1 and 2) (Evaluated in Chapter 7 Test and Final)
2. Identify and use functions expressed in various forms. Formulate functions in equation form, graph them, and solve for the necessary variable. (CG 1) (Evaluated in Chapter 7 Test, Chapter 13 Test and Final)
3. Develop an understanding of the graphical presentation of data and the interpretation of the information presented by graphs. Compute the measures of central tendency and variability, and use them to compare and contrast sets of data. (CG 2) (Evaluated in Chapters 8 & 9 Test and Final)
4. Distinguish between empirical and theoretical probability. Compute probabilities for various scenarios. (CG 1) (Evaluated in Chapters 8 & 9 Test and Final)
5. Demonstrate competence in the knowledge of the properties of points, lines, and plane figures. Know the definitions and concepts resulting from a study of curves and polygons in a plane. Develop competence in analyzing the properties and relationships of figures in space. (CG 1 and 2) (Evaluated in Chapters 10 and 11 Test and Final)
6. Perform basic compass and straight edge constructions. (CG 1-3) (Evaluated in Construction Project)
7. Develop an understanding of the meaning and practical use of measurement concepts using both the English and metric systems. Extend linear measure concepts to perimeter, area, and volume in the context of plane figures and space figures. (CG 1-3) (Evaluated in Chapters 10 and 11 Test and Final)
8. Develop an understanding of and competence in using transformations to solve problems and identify patterns and symmetries. (CG 1-3) (Evaluated in Chapter 13 Test and Final)
9. Understand the basic triangle congruence and similarity theorems. (CG 1-3) (Evaluated in Chapter 12 Quiz and Final)
10. Work in groups in order to explain mathematical solutions and to develop mathematical instruction appropriate for elementary/middle school students. (CG 3 and 4) (Evaluated in the Group Activities)

BIBLICAL MANDATE FOR THIS COURSE

The source of wisdom and knowledge is the Lord, and a keen mind is a gift from God. It is my hope that mathematical study will show you the greatness of God and increase Christlikeness in you (Colossians 1:17 and Philippians 2:5). God has given man the capacity to reason mathematically and expects you to be able to reason logically (Isaiah 1:18). The study of mathematics helps to develop your God-given ability to reason. As a Christian, you need to be able to discern truth and filter ideas through a biblical worldview. Also, mathematics is the study of the underlying structure of the universe and its intelligent design. Mathematics is an avenue of studying the God-created universe in its complexity, harmony, and precision. Math is a tool that can help you fulfill the God-given mandate found in Genesis 3:28 to exercise dominion over the earth.

The study of mathematics from a Christian perspective will help you to better know God and imitate Him more closely. You can see the consistency of God in the consistency of His universe. Because of this consistency, we can model a physical law and study it through mathematics. The study of mathematics can also help you to develop Christ-like character traits such as diligence, honesty, precision, perseverance, and humility.

Daily Expectations for Effective/Efficient Study:

Before class: Take a few minutes to look over what the next lesson will cover. Ask yourself (1) Is this a concept that I already know? (2) How was I taught to do this particular function? (3) Are the concepts presented here like the way I learned or possibly different? (4) Which way do I find easiest to understand/explain?

After class: Take a few minutes to look over your notes. Are the important terms/concepts there? Are the procedures that were presented in class clear to you? Could you teach them to someone if needed?

Course Requirements

1. **Homework**

Homework problems are assigned for each section. Here are some tips for completing homework successfully:

- Try to complete the homework problems before the next class period after a section is finished.
- You are welcome to work together with classmates on the solutions.
- If you get stuck on a problem, leave space for it, and go on to the next one. There are many ways to get help outside of class (see next page). I will also be happy to take some time in class to work through problems that students are struggling with.
- You should make it a practice to do your work neatly and completely on full-sized notebook paper, working down the page (don't try to put 2-3 columns of work on the page—it is too crowded.) Be sure to number the problems and leave space as appropriate between problems as well for easy readability.
- Don't just turn in a list of answers—I already know the answers! Your job is to show the thinking that led you to the answers—convince me that you know what you are talking about. You should also be thinking ahead to your future students. Clear and complete explanations will be vital for their understanding.
- Part of the assignment is checking to make sure your answers are correct and fixing any that are not correct. There is a key with the answers available in Canvas. A fuller Solutions Manual with explanations of how to arrive at the answer is available in the Math Center.

Homework will be assessed by a 10-point student reflection that will be due in Canvas before class on days indicated on the Course Schedule. You will report what percent of the assigned problems that you completed, checked, and corrected. For the first chapter, you will also need to upload pictures of your finished homework pages. After that, you will not need to upload your work unless the teacher asks you to.

Note that after the first test, students who earned an A on the previous test will automatically get full credit for the homework. So homework is more or less optional for them, though *they still have to do the reflection*. But A students know that the best way to *maintain* an A in the class is to be faithful to do their homework!

2. **Activities**

I have developed class activities to be helpful in reinforcing the concepts found in the textbook. As a future teacher of mathematics, you need to know that mathematics is not a spectator sport. You cannot learn mathematical ideas solely by watching someone else present them. Instead, you need to learn to actively think through mathematical ideas. By discussing mathematical ideas and explaining the solution methods to one another, you can deepen and extend your understanding of mathematics.

The class will be broken into small groups to do activities. You will have time in class to work together, but you may need to get together outside of class. If meeting in person is not convenient, consider using a tool like Microsoft Teams to "meet" online.

For each activity, one activity per group will be **turned in at the beginning of the class** on the indicated day on the schedule. All students in the group are expected to contribute to the solutions. All participates will receive the same grade. Non-participates will receive a zero on that activity. Each Activity will be worth 10 points. There will be a total of 6 graded activities. The lowest grade will be dropped making your activity grade worth 50 points.

3. **Article Readings**
   There will be 4 article reading assignments this semester. These articles will look at various topics on teaching mathematics and will include a summary activity to be turned in to Canvas before midnight on the day assigned. Each Article will be worth 10 points.

4. **Bonus**
   The Review Questions at the end of each chapter may be completed and turned in the day of the test for 3 bonus points each. The assigned problems will be listed in the Homework section, and for these you will be required to turn in the actual work pages—either by handing them in in person or uploading pictures of the finished pages to Canvas. You must turn in your bonus work before the test to receive credit.

5. **Tests**
   a. 5 Unit Tests—60-100 points each
   b. Final Exam—150 points

Where to seek help for this class

1. Talk to your teacher during an office hour or make an appointment for non-office hour.
2. Study with another student in your class.
3. Visit the Math Center in MB 201 on 2nd floor of the Mack Building. It is a free service and is open all of the hours that the library is open. The HW solutions manual is in the Math Center.

Grading

Item	Pts.	Total		Scale	
Homework	10 each	70		90–100	A
Activities	10 each	50		80–89	B
Article Readings	10 each	40		70-79	C
Construction Activity	25	25		60–69	D
Unit Tests	60-100 each	395		59 ↓	F
Final Exam	150	150			
Total Points		**730**			

Cell Phones and Laptops

Keep your cell phone muted or off during class. The cell phone should be placed in your bag or pocket unless you are aware of an emergency call that might be coming. In that case, be sure to let your teacher know before the start of the class. There is little reason why a laptop should be used during a math class. You should have pencil, paper, and your textbook out and ready to use in class. If for some reason you have a legitimate need of a laptop in class, please see your teacher and we will discuss this need.

Attendance Policy

I want you to be successful in this class. The main sources of learning are the daily classroom activities and related discussions. Therefore, you are expected to attend and arrive on time for all class sessions. You will be held responsible for all information from each class session, whether you are in attendance or not.

There are two types of absences allowed by the University Attendance Policy (see the Student Handbook for details):

> **Personal Absences** are for funerals, sickness, doctor's or dentist's appointments, visits and interviews at graduate school or for interviews for future employment.
> Personal absences are **not "skips"**. They are not provided so that students can prepare for other classes or to extend official university breaks or simply because they do not feel 100% well (of course if you have a fever or any such symptoms I prefer that you not come to class!). *For a MWF class you are allowed 3 Personal Absences*.
>
> **Service Absences** may be used to attend approved academic functions or conferences, approved Christian service projects, required military duty or as part of an intercollegiate athletic team. However, students who exceed the Personal Absence limit due to a chronic illness are not eligible

to participate in events that require Service Absences. *For a MWF class you are allowed 4 Service Absences*.

For *an excused planned personal or service absence*, you are expected to **notify your teacher at least one week ahead of time.** Please do so by e-mail. Homework should be turned in and scheduled tests should be taken before your planned absence. If you do not turn in your work or take the test prior to your absence, a penalty will be applied to your grade.

For *absences due to incapacitating illness or emergency*, you should **contact your teacher as soon as you are able—**within **24 hours** at the latest. When you contact your teacher, we will make arrangements for you to make up any work that you may have missed without penalty.

For *an unacceptable absence* (to work on an assignment, to study for a test, to visit with friends, etc.), no class work may be turned in resulting in a **0 for missed assignments**. You will receive a **10% penalty on a missed test**.

Partial Attendance marks will also contribute to your overall total Personal Absences. Part of your training for life while in college is to develop professional habits like being on time for required events and not leaving early just because you want to. Thus, the attendance policy includes partial absences that will be accrued if you arrive up to 15 minutes after the start of class or leave class up to 15 minutes early. *Three Partial Attendance marks will count as a Personal Absence*. If you miss more than 15 minutes of class you will be counted as absent.

In Case of Emergency

In case of emergency requiring evacuation, students will go down the stairs on the Mack Building side and exit the door facing Wade Hampton underneath the stairs. Students will gather by the big tree at the end of the Mack Building parking lot with their class. You should look for the people at your table and verify that everyone who was in attendance is accounted for.

If we are unable to exit the building, I will instruct you on the best course of action. To be able to respond quickly to external threats, I may keep classroom doors locked. If you are late arriving to class, you may need to knock on the door and be let in.

Cheating

Cheating is defined as any use of unauthorized helps. In today's age of technology, this includes getting unapproved help from a source on the internet (including generative AI tools such as Chat GPT, Bing Chat, etc.) and/or using your calculator to store formulas or information that you are to know from memory. If you have a question about any source you are considering using, please gain teacher approval before using it. The presence of any material on your desk containing formulas, notes, etc. (except those allowed by the instructor) while taking a test, will be construed as cheating and will be dealt with as such. Cheating on a test will result in a zero on the test plus any penalties imposed by the university.

Tentative Course Schedule (Spring 2026)

Homework (HW) and Activities are due on the date listed.
Article instructions found on Canvas (listed as Article Reading Assignments)
Schedule subject to change. See Canvas Syllabus for the most up-to-date schedule.

Date	Day	Class	Due Dates
Jan. 14	W	Course Introduction	
Jan. 16	F	7.1	
Jan. 19	M	**MLK JR. DAY**	
Jan. 21	W	7.2	
Jan. 23	F	7.3	
Jan. 26	M	**Activity ch 7**	
Jan. 28	W	Catchup/Review	Activity ch 7 due
Jan. 30	F	**Chapter 7 Test**	HW Reflection ch 7 due
Feb. 2	M	8.1	Article 1 Due
Feb. 4	W	8.2	
Feb. 6	F	8.3	
Feb. 9	M	**Activity ch 8**	HW Reflection ch 8 due
Feb. 11	W	9.1	Activity ch 8 due
Feb. 13	F	9.2	
Feb. 16	M	9.3	
Feb. 17-20	T-F	**BIBLE CONFERENCE**	
Feb. 23	M	**Activity ch 9**	
Feb. 25	W	Catchup/Review	Activity ch 9 due
Feb. 27	F	**Chapter 8 & 9 Test**	HW Reflection ch 9 due
Mar. 2	M	10.1	Article 2 due
Mar. 4	W	10.2	
Mar. 6	F	10.3	
Mar. 9	M	**Activity ch 10**	HW Reflection ch 10 due
Mar. 11	W	12.1	Activity ch 10 due
Mar. 13	F	12.2	
Mar. 16	M	12.3	
Mar. 18	W	Catchup/Review	
Mar. 20	F	**Chapter 10 & 12 Test**	HW Reflection ch 12 due
Mar. 23-27	M-F	**SPRING BREAK**	
Mar. 30	M	11.1	Article 3 due
Apr. 1	W	11.2	Construction Project due (12.2)
Apr. 3	F	11.3	
Apr. 6	M	11.4	
Apr. 8	W	**Activity ch 11**	
Apr. 10	F	Catchup/Review	Activity ch 11 due
Apr. 13	M	**Chapter 11 Test**	HW Reflection ch 11 due
Apr. 15	W	**UNIVERSITY SERVICE DAY**	
Apr. 17	F	13.1	Article 4 due
Apr. 20	M	13.2	
Apr. 22	W	13.3	
Apr. 24	F	**Activity ch 13**	
Apr. 27	M	Catchup/Review	Activity ch 13 due
Apr. 29	W	**Chapter 13 Test**	HW Reflection ch 13 due
May 1	F	Final Exam Review	
May 5	T	**Final Exam 9:30-10:40 am**	

Homework Problems

7.1: 1, 2, 3, 5 (a, b, e), 6 (a, c), 7, 10, 12, 15, 16 (a), 20 (a, b), 24, 27, 28, 30, 31, 36, 40, 41, 42, 45 (a), 51, 54 (23 problems)
7.2: 2, 3 (a, b), 5 (a, c), 6, 7 (a), 9, 11, 17, 18 (a, b), 20, 21, 25, 31, 33, 40, 42, 43, 45, 47, 51 (20 problems)
7.3: 1 (a), 2 (a), 3 (a), 4 (b), 5 (a), 7, 9, 12 (a), 24, 28, 31, 37 (12 problems)
EC Review Questions, chapter 7: 1-2, 5-6, 9, 11-12, 14, 19, 25, 32, 34-41, 43-48 (25 problems)

8.1: 1, 4, 6, 7, 10, 11, 13 (a), 14, 21 (b, c), 29, 33, 34 (b), 39, 47, 49, 54 (16 problems)
8.2: 2, 4, 5, 10, 11 (a), 12 (c), 15, 17 (a), 20, 21, 22 (a), 28, 33, 34, 37, 41, 43, 50 (a), 51, 52, 54 (a), 56 (22 problems)
8.3: 1, 2, 4, 6, 11, 12 (b, c), 19, 21, 22, 24 (a, d), 26, 27, 28 (c), 34, 35 (a), 39 (16 problems)

9.1: 1, 3, 6 (a), 8 (b, d), 10, 12, 17 (b), 19, 21, 23, 30, 31, 34, 36, 41, 43, 45, 48, 61 (a), 62 (c), 67 (21 problems)
9.2: 4, 5, 8, 13, 15, 18 (a, b), 19, 23, 25, 26, 30, 35, 39, 42 (b), 44, 48 (16 problems)
EC Review Questions, chapters 8 & 9: ch 8 – 2, 3, 4, 5, 8, 10, 13, 18, 20, 24, 25, 29, 31, 32, 35, 38, 40, 41, 44, 45, 48 (21 problems) ch 9 – 1, 3, 4, 6, 10, 12, 14, 16, 18, 20, 22, 23, 26, 27, 28, 29, 30, 32, 34 (19 problems)

10.1: 1, 3, 6, 10, 12, 13, 15, 18, 20, 21 (b), 23 (a, d), 33, 34 (a), 35 (a), 36 (a), 37, 39, 44, 46 (19 problems)
10.2: 2, 4, 8, 9 (a), 11, 12, 14, 16, 19 (a), 21, 24, 27, 30, 31, 35 (a, c, e), 37, 38, 41, 47, 49, 53, 54, 59, 62 (24 problems)
10.3: 2 (a, c, e, g, h), 5 (b), 8 (b), 9 (a, c, e, g, h), 10, 13, 14, 19, 20 (a, b, c, d), 26, 32, 37, 42, 43, 50, 51 (16 problems)

12.1: 1 (c), 3 (a), 4 (a), 5 (b, c, e), 7, 9, 11, 12, 13 (a, c), 17 (a), 18 (b), 24, 27, 34, 35 (a), 41, 42, 43 (a) (18 problems)
12.3: 1, 3, 4, 5, 9, 12, 13, 15 (a), 17, 23, 31, 39 (a, c) [error in the problem; should say, the two given triangles are <u>similar</u> not congruent.], 40, 42, 46, (15 problems)
EC Review Questions, chapters 10 & 12: ch 10 – 5, 8, 10, 11, 13-15, 17, 18, 20-22, 24-26, 29-33, 38, 40, 41, 44 (24 problems) ch 12 – 1, 6, 8, 11, 12, 15, 28, 33, 37-40, 43-46 (16 problems)

11.1: 2, 4, 6 (b, d), 9, 11, 14, 16, 17, 19, 20, 23, 29, 30 (a), 34, 37, 39, 42, 45, 48, 50, 55 (a), 56, 59 (a, d) (23 problems)
11.2: 7, 8 (a, c), 12, 14, 16, 19, 21, 23, 25, 28, 30 (d), 38, 41, 42, 53, 58, 61 (a), 63 (a, c), 68 (19 problems)
11.3: 1, 4, 5 (a), 7, 9 (a), 10, 11 (a), 14 (a, b), 15, 16 (a, c), 20, 23, 31, 33 (c), 34, 37 (a, c), 39, 43 (a), 45 (19 problems)
11.4: 1 (a), 5 (c, d), 7 (c, d), 8, 10, 11, 16, 20 (c, d), 22 (a, c), 24, 27, 37 (c, d), 39 (c, d), 42 (c, d), 51, 52, 54 (17 problems)
EC Review Questions, chapter 11: 4, 5, 7, 9, 10, 12, 14, 16, 18, 20, 21, 23 (a,b), 28, 29, 31, 33, 34, 37, 38, 39, 40, 41, 42, 43, 48, 49, 51, 52, 53, 57 (30 problems)

13.1: 1, 2, 3, 6, 9 (a), 10 (a), 11 (a, b, d), 17, 19, 21, 22, 24, 28, 29, 30, 34 (a, c), 36 (a), 37 (b), 39 (a), 41 (a), 43, 47 (a, d, e), 49 (23 problems)
13.2: 1, 4, 5, 10, 13, 16 (a), 20, 21, 26, 27, 30, 31 (a), 33, 40, 42 (a), 47 (a) (16 problems)
13.3: 1, 2, 3, 5, 7, 8, 10, 11, 17, 20 (a), 22 (c), 27 (a, b), 35, 45, 46, 58 (16 problems)
EC Review Questions, chapter 13: 1, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 18, 24, 25, 26, 29, 32, 34, 42, 45, 47, 51, 54, 57, 58, 64, 68, 69 (30 problems)