BOB JONES UNIVERSITY
EST. 1927

Ma 105
Trigonometry
Fall, 2023, Syllabus and Assignment Schedule

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Office Hours:	2 pm daily others by appointment	Credit/Load:	3/3

I welcome you to contact me outside of class, especially if you are having any difficulty with your classwork. Email is the best way to contact me or talk to me before or after class.

Course Information

Course Description

A review of the exponential, logarithmic, trigonometric functions and their graphs, trigonometric identities/ equations and applications, as well as an introduction to sequences and series.

Course Context

Mathematical Sciences Division Goals

Context: The faculty of the Division of Mathematical Sciences has developed four broad goals and has aligned these goals with the Bob Jones University Institutional Goals and Liberal Arts Core. The Division Goals (DG) are as follows:
The student will…

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

Course Goals

1. To develop a good Christian attitude toward mathematics in general and transcendental functions in particular and to mature mathematically (DG 1, 2, 3)
2. To develop Christlike qualities such as perseverance, diligence, and dependence on God.(DG 3)
3. To develop applications of transcendental functions to solving real-life problems (DG 1, 3, 4)
4. To develop an ability to recognize, manipulate, and solve expressions and equations involving the basic transcendental functions: exponential, logarithmic, and trigonometric (DG 1, 2, 3)
5. To develop the ability to reason analytically in problem solving and basic proofs (DG 1, 2, 4)
6. To develop the ability to recognize various types of trigonometric equations and methods of solution using trigonometric identities (DG 1, 2, 4)
7. To develop an ability to use a calculator to solve exponential, logarithmic, and trigonometric problems (DG 3, 4)

Course Objectives

With at least 70% accuracy, you will be able to do the following:

Course Objectives	Course Goals Supported	Course Content	Primary Assessment
Use a calculator and numerical computation techniques to estimate the value of the numbers such as e and trigonometric function values. (NCTM 1e, 4c).	3, 7	Chapters 4-7	Tests
Describe characteristics of relations, functions, and inverse functions in general and as applied to exponential, logarithmic, and trigonometric functions. (NCTM 1b, 1e).	4, 6	Chapters 4-7	Tests
Solve equations involving exponential, logarithmic, and trigonometric expressions. (NCTM 1b, 1e).	3, 4, 5	Chapters 4-7	Tests
Solve applied problems by using exponential and logarithmic functions and trigonometry. (NCTM 1b, 2a)	1, 3	Chapters 4, 5, 7	Test
Use geometric concepts such as triangles and circles to define trigonometric concepts. (NCTM 1e).	4, 5, 6	Chapter 5	Test
Graph the transcendental functions and describe the transformational effects of certain algebraic substitutions on the graph. (NCTM 1b, 1e)	4, 5, 6	Chapter 5	Test
Manipulate exponential, logarithmic, and trigonometric expressions. (NCTM 1b, 1e).	4	Chapters 4-7	Test
Recognize different types of proof, determine valid forms of proof, and apply these skills to make correct life-long decisions based on the Scripture. (NCTM 2b).	2, 5, 6	Chapter 6	Application Questions
Write proofs of trigonometric identities and proof by mathematical induction. (NCTM 1e, 2b).	4, 5	Chapter 6, 11	Quizzes and Test
Define sequences and series by nth term and recursive definitions.	5	Chapter 11	Quizzes
Describe geometric and arithmetic sequences and series.	5	Chapter 11	Quizzes

NCTM Content Program Standards (2020)

Biblical Mandate for this Course

The source of wisdom and knowledge is the Lord, and a keen mind is a gift from God. Mathematical study should reflect the greatness of God and increase Christlikeness in the believer (Colossians 1:17 and Philippians 2:5). God has given man the capacity to reason mathematically and expects a Christian to be able to reason logically (Isaiah 1:18). The study of mathematics develops the God-given ability to reason. A Christian needs to discern truth, and all ideas should be filtered though 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. In this way the Christian can fulfill his God-given mandate found in Genesis 3:28 to exercise dominion over the earth.

The study of mathematics from a Christian perspective helps a person know God better and imitate Him more closely. The student sees the consistency of God in the consistency of His universe. Because of this consistency, he is able to model a physical law and study it through mathematics. The study of mathematics also helps the Christian to develop Christ-like character traits such as diligence, honesty, precision, perseverance, and humility.

Course Resources

Textbook Information

Algebra & Trigonometry, 8th ed. by Aufmann and Nation, Cengage Learning, 2015, ISBN-13: 978-1-285-44942-5,
ISBN-10: 1-285-44942-8

We chose this textbook because it provides mathematical information at an understandable level and gives many examples to help you understand concepts. Read it thoroughly with paper and pencil in hand. Work through the examples in the book as you come to them. This is an important part of the class. You are responsible for all the information in the textbook even if we do not have time to discuss it in class. We will try to clarify big concepts and work problems in class.

Supplemental Resources

Articles : *Taking God Out of the Equation* found at http://www.answersingenesis.org/articles/am/v7/n1/equation
and others found at http://biblicalchristianworldview.net/mathematical-circles.html

Calculator: A graphing calculator is required for this course. It is suggested that math students taking Ma 105 who will be going into Calculus I (Ma 200) own a TI 83, 84, 89, or TI-Nspire. Students who plan to continue taking math classes beyond Calculus I are required to own a TI 89 or TI-Nspire CAS. If you are not planning on continuing in upper level STEM classes then any graphing calculator will be fine for this class.

Course Expectations

Time Expectations

Ma 105 is a quickly-paced review of essential math topics needed for the Calculus series and other higher-level math classes. You should plan on spending at least 6 hours per week (often 9 to 10 hours) outside of class on this course. If you are spending more than 10 hours per week outside of class for this course, please see me so that I can help you study more efficiently.

Assessments

1. Homework problems from each assigned section (See Course Schedule.)
2. Four discussions with and among your classmates (See Course Schedule.)
3. Four Exams (See Course Schedule.)
4. Application Questions – designed to use the topics covered in class in a more real-life setting
5. Several open-book quizzes covering textbook reading and problems will be taken on Canvas.
6. Various in-class quizzes
7. One cumulative final exam

Quizzes

Frequent small evaluations will help you learn the concepts better. There will be occasional unannounced and/or announced quizzes in class. Always be ready. Because missed in-class quizzes due to absence will not be made up, the lowest in-class quiz grade will be dropped when calculating final grades. There will also be regular Canvas quizzes (watch the schedule) which will be open book but will count as a quiz grade. **Please take these online quizzes without help from any other person.** Understanding that technology can fail, always take online quizzes as early as possible. If you have technology problems, let me know right away.

DPP

Most class days will begin with Daily Practice Problems. These will count 4 points per week. Generally these questions will review recent material covered in class.

Homework

Homework is crucial to success in this course. It is also one of the primary means by which you represent yourself as a "professional" in academia, and the way in which you will develop the mathematical habits that will help you be successful on the larger quizzes and tests. Therefore, we have the following expectations for homework, and failure to meet these expectations may mean that your assignment will be returned to you to be corrected.

1. Homework must be neat and well organized. This means neatly written work and pages with no wrinkles, little edges from a spiral notebook, etc. Section numbers and page numbers should appear at the beginning of each new section.
2. Homework should be worked out in detail. Answers alone are not acceptable.
3. Problems should be worked going down the page, never across.
4. You are responsible for checking all your homework problems from the answers in the back of the book. Complete Solutions Guides are available on reserve in the library at the check-out desk. You should use them frequently. Do not copy the answers but use the Guides as a resource to learn the material that you are expected to know. **Place the number you got correct (on your initial attempt) out of the total at the top of the page.** Any problems that are incorrect on your initial attempt, correct in your homework to the side of your original work. Missing these problems will not cause your grade to be lowered but will give an idea of your areas of weakness in understanding the material.
5. **Bring your completed homework for the current chapter to class every day.**

Need Help?

We want you to be successful in this class. You must seek help when needed because you are the only one who knows when you need it. If you need help there are at least three avenues to get it, reach out to one of these:
1. Teacher
2. Free Math Tutor
3. Classmates
4. Study Group

Whenever Mack Building is open you have a free math tutor. Go to the Math Lab (ML 1) on second floor. There you will find a qualified upper-class math student who is willing and capable to help you. If you think that a study group would help you, let me know and we will set one up.

Policy Regarding Students with Disabilities:
Bob Jones University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. Please let me know within the first week of class if you have a documented learning disability or condition that will impair your ability to complete this course successfully. Also, I would appreciate your letting me know if you are receiving help through the BJU Center for Learning and Academic Services this semester, or if you feel you need additional academic support. I am happy to help you access the various academic resources available here on our campus. Please also let me know about any serious medical condition that will hinder your learning this semester or will require specific medical care in case of an emergency.

Grading

The following is a breakdown of how the final grade is calculated.

Assignments	Point value per assignment	Total points per assignment type
Homework (5)	10	50
Application Questions (4)	20-30	100
Exams (4)	100	400
In-class Quizzes (?)	10	?
Online Quizzes (8)	10	80
Discussions (4)	5	20
Final Exam (1)	150	150
Total		**800+**

Scale:	
A	90-100%
B	80-90%
C	70-80%
D	60-70%
F	<60%

Extra Credit

Some exams will include opportunity for extra credit. These points will be added on to each exam. You may also earn a maximum of **16 extra credit points** by working **the odd-numbered problems** in the Review Sections for chapters 4-7 and handing these in **before taking the chapter test or on the day of the final exam.** Each review section that you hand in will count 4 points of extra credit.

Classroom Procedures

Classroom Deportment:
Compliance with student handbook policies is expected during class.

Cell Phones and Laptops:
Cell phones are not permitted to be out during class. Make sure they are muted and do not ring during class. You should have pencil, paper, and your textbook out and ready to use in class. If for some reason you have a need of a laptop in class, such as use of an ebook for class, please see me and we will discuss this need.

Attendance Policy:
Regular attendance is very important in this class. If you miss a class, you will be missing some essential information that will help you be more successful in your career. I will follow the BJU Attendance Policy that is set forth in your Student Handbook. For additional information, please see the current Bob Jones University Student Handbook. Naturally, if you are absent on a day when you have been informed in advance that work is due, then the late policy is (10% deduction for each calendar day late) and applies for that assignment regardless of the nature of the absence.

Academic Integrity:
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.

Copyright Policy

Date	Day	Class	Assignment
8/23	W	Introduction/4.1	
8/25	F	4.1/4.2	**Bonus Quiz on the Syllabus – Use your syllabus to take**
8/28	M	4.2/4.3	Sec. 4.1 5–17, 23–27, 31, 35, 41, 49, 55, 59 (24 problems) **Discussion Due – Article #17 "Why Learn Math" Discuss on Canvas.**
8/30	W	4.4	Sec. 4.2 7–13 odd, 19–21, 25, 27, 29, 33–39 odd, 49, 52 (16 problems) Sec. 4.3 7, 11, 15, 19–25 odd, 29, 31, 35, 37, 41–47 odd, 51, 55, 59, 61, 65, 70, 71, 78, 91 (24 problems)
9/1	F	4.5	Sec. 4.4 7–15 odd, 21, 22, 23–31 odd, 37, 39, 43, 47, 71, 77, 81 (19 problems) **4.1-3 Online Quiz Due**
9/4	M	**Labor Day**	
9/6	W	4.6	Sec. 4.5 9–13 odd, 18, 21, 29, 33, 39, 42, 45, 55, 57 (12 problems)
9/8	F	Catch up / Review	Sec. 4.6 7, 17, 19, 25, 35, 40, 55 (7 problems) **4.4-5 Online Quiz Due**
9/11	M	**Chapter 4 Exam**	Extra Credit: Chapter 4 Review Exercises 1–93 odd
9/13	W	4.7 – Modeling Data	**Discussion Due – Article #71 "Logarithms and Large Numbers" Discuss on Canvas.**
9/15	F	5.1– **Ch. 4 Application Questions Due**	
9/18	M	5.2	Sec. 5.1 3, 13–17 odd, 23–29 odd, 37–41 odd, 51, 53, 61–65 odd, 70 (17 problems)
9/20	W	5.3	Sec. 5.2 1, 5, 11, 13–21 odd, 27, 31, 34, 53, 60, 70 (14 problems)
9/22	F	5.4	Sec. 5.3 1–15 odd, 21–31 odd, 41–45 odd, 48, 51–57 odd, 65–69 odd, 75 (26 problems) **5.1-3 Online Quiz Due**
9/25	M	5.5	Sec. 5.4 1, 3, 21–29 odd, 45–55 odd, 69, 75 (15 problems)
9/27	W	5.6/5.7	Sec. 5.5 1–9 odd, 19–25 odd, 37, 41, 53, 59–63 odd (14 problems)
9/29	F	Catch up / Review	Sec. 5.6 1–13 odd, 23, 64 (9 problems) Sec. 5.7 1, 3, 7, 17, 19, 20, 21, 37, 39, 61 (10 problems) **5.4-6 Online Quiz Due**
10/2	M	**Chapter 5 Exam**	Extra Credit: Chapter 5 Review Exercises 1–69 odd
10/4	W	6.1 – **Ch. 5 Application Questions Due**	**Discussion Due – "The Humanists Dilemma" Discuss on Canvas.**
10/6	F	6.2	Sec. 6.1 5–15 odd, 16, 25–33 odd, 47, 57 (14 problems)
10/9	M	6.2	
10/11	W	6.3	Sec. 6.2 9–17 odd, 25–33 odd, 43, 49, 65, 70 (14 problems) **6.1-2 Online Quiz Due**
10/13	F	6.4	Sec. 6.3 11, 13, 17, 19, 29, 47–51 odd, 59, 67, 75, 77 (12 problems)
10/16-17	M-T	**Fall Break**	
10/18	W	6.5	Sec. 6.4 11, 17, 21, 31, 37, 41, 47, 53, 55, 87 (10 problems)
10/20	F	6.5	**6.1-4 Online Quiz Due**
10/23	M	6.6	Sec. 6.5 5, 11, 15, 17, 21–25 odd, 29–37 odd, 67 (13 problems) **Ch. 5.1-6.5 Review Online Quiz Due**
10/25	W	6.6	
10/27	F	Catch up/Review	Sec. 6.6 7, 11, 13, 19, 21, 30, 33, 38, 44, 63 (10 problems)
10/30	M	**Chapter 6 Exam**	Extra Credit: Chapter 6 Review Exercises 1–69 odd
11/1	W	7.1 - **Ch. 6 Application Questions Due**	
11/3	F	7.1/7.2	**Discussion Due – "God and Math" Discuss on Canvas.**
11/6	M	7.2	Sec. 7.1 5–15 odd, 23–27 odd, 37, 39, 53 (12 problems) **7.1-2 Online Quiz Due**
11/8	W	7.3	Sec. 7.2 7, 11, 13, 16, 23, 24, 34, 37, 47, 51 (10 problems)
11/10	F	7.4	Sec. 7.3 11, 15–21 odd, 29, 37, 47, 49 (9 problems) **7.3-4 Online Quiz Due**
11/13	M	7.5	Sec. 7.4 7, 13, 21, 25–29 odd, 45, 53, 61, 69 (10 problems)
11/15	W	Catch up/Review	Sec. 7.5 7, 11, 23–27 odd, 37, 39, 51 (8 problems)
11/17	F	**Chapter 7 Exam**	Extra Credit: Chapter 7 Review Exercises 1–69 odd
11/20-24	M-F	**Thanksgiving Break**	
11/27	M	Review Chapter 7 Exam **Ch. 7 Application Questions Due**	
11/29	W	11.1	
12/1	F	11.2	Sec. 11.1 7–15 odd, 27, 31–35 odd, 55, 59, 63–67 odd, 74 (15 problems)
12/4	M	11.3	Sec. 11.2 5–13 odd, 21, 25–35 odd, 45, 47, 59, 61 (16 problems)
12/6	W	11.4	Sec. 11.3 5–13 odd, 23, 27, 33, 37–41 odd (11 problems)
12/8	F	Review	Sec. 11.4 3, 7 (2 problems)
12/11	M	**Final Exam (8 a.m.)**	