

Ma 105
Trigonometry
Fall, 2020, Syllabus and Assignment Schedule

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Office Hours:	10 am daily via Teams 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 exponential, logarithmic, trigonometric functions and their graphs.

Course Context

Mathematical Sciences Division Goals

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.

Course Goals

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

Course Objectives

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

Course Objectives	Goals Supported	Course Content	Primary Assessment
A. Use a calculator and numerical computation techniques to estimate the value of the numbers such as e and trigonometric function values. (NCTM A.2.1, A. 2.7) *	7, 3, 8	Chapters 4-7	Tests
B. Describe characteristics of relations, functions, and inverse functions in general and as applied to exponential, logarithmic, and trigonometric functions. (NCTM A.2.2, A.2.3).	4, 6	Chapters 4-7	Tests
C. Solve equations involving exponential, logarithmic, and trigonometric expressions. (NCTM A.2.1).	3, 4, 5, 7	Chapters 4-7	Tests
D. Solve applied problems by using exponential and logarithmic functions and trigonometry. (NCTM A.2.4, A.2.7, A.3.10)	1, 3, 7	Chapters 4, 5, 7	Test
E. Use geometric concepts such as triangles and circles to define trigonometric concepts. (NCTM A.3.4, A.3.5).	4, 5, 6	Chapter 5	Test
F. Graph the transcendental functions and describe the transformational effects of certain algebraic substitutions on the graph. (NCTM A.2.3, A.3.2)	4, 5, 6	Chapter 5	Test
G. Manipulate exponential, logarithmic, and trigonometric expressions. (NCTM A.2.1, A.2.2).	4	Chapters 4-7	Test
H. 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 A.3.9, A.3.10).	2, 5, 6	Chapter 6	Application Questions
I. Write proofs of trigonometric identities and proof by mathematical induction. (NCTM A.3.8, A.3.9, A.3.10).	4, 5	Chapter 6, 11	Quizzes and Test
J. Define sequences and series by n th term and recursive definitions. (NCTM A.2.3).	5	Chapter 11	Quizzes
K. Describe geometric and arithmetic sequences and series. (NCTM A.2.3).	5	Chapter 11	Quizzes

NCTM/CAEP Content Program Standards (2012)

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 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. 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 below.)
2. Four discussions with and among your classmates (See Course Schedule below.)
3. Four Exams (See Course Schedule below.)
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 BJUOnline.
6. Various in-class quizzes
7. One cumulative final exam

Quizzes

Frequent small evaluations will help you learn the concepts better. So 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 BJUOnline 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.

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 of 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.** Twice during a chapter, homework will be collected and graded for completeness. Each time homework is collected it will be worth a maximum of 5 points (with a total of 10 points per chapter). This will not be announced ahead of time. To be sure to get homework credit, you must have homework completed by the due date on the schedule.
6. Any homework assignment not following the above guidelines, will be returned to the student ungraded and will receive a 0 until the assignment is resubmitted in accordance with these guidelines.

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 upperclassman math student who is willing and capable to help you. The time for a scheduled study group will be announced as soon as it is available. The scheduled study group will be led by an upper-level mathematics student. Study group sessions are intended to clarify and discuss big concepts presented in class, to work together with classmates to help each other understand concepts, and to discuss strategies for studying and preparing for upcoming exams. These sessions are to help you get over the academic hurdles and demands of the class but you must be prepared for the study group by attempting the assigned work ahead of time.

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 will 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. This includes the wearing of masks and social distancing by all students while in the classroom.

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. 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 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 Bob Jones University 2020-21 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. I value academic integrity. Therefore, I will take appropriate action if cheating or plagiarism occurs in this course. For additional information, please see the Bob Jones University 2020-21 student handbook.

Copyright Policy

Copyright (2020, Pilger) as to this syllabus and all lectures. Students are prohibited from selling (or being paid for taking) notes during this course to or by any person or commercial form without the express written permission of the professor teaching the course. This syllabus is a guide to course goals and objectives, procedures, requirements, assignments and grading. The professor reserves the right to amend the syllabus when circumstances dictate.

Tentative Course Schedule:

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