

# GEOMETRY

2018-2019

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## I. COURSE RATIONAL AND APPROACH

In general, the benefit of studying mathematics is that it helps one to develop clarity of thought and organization and to recognize patterns and argument structures. Because of this, studying mathematics will surely help your student to become a better thinker, which will in turn help them in their apologetic or evangelistic endeavors. This geometry course, specifically, "is a 'traditional' geometry class, requiring the students to prove theorems. Different colors and shading are used to distinguish among postulates, definitions, theorems, and constructions. Exercises in class and in the text seek to develop problem-solving skills and reinforce the geometry concepts covered in each lesson. The class & curriculum are biblically based throughout - the text contains one feature section per chapter on "Geometry and Scripture." "Dominion Thru Math" exercises, scattered throughout each chapter, relate to the chapter openers and offer the opportunity for students to use technology in problem-solving. "Analytic Geometry" helps students to make the algebra-geometry connection in each chapter. "Geometry Around Us" reveals some of geometry's secret hideouts. "Mind over Math" brain teasers are included."

The course will be taught according to what might be called a traditional or classical approach to education. At its basic level, this means that the course approaches mathematics with a high view of man as the image bearer of God. Mathematics, as the study of God's creation insofar as it is quantifiable, will be taught out of a love and pursuit of the good, the true, and the beautiful, which ultimately finds its source in God. While the memorization and application of theorems is important, the study of mathematics should include the investigation of the mathematical problems and historical context in which those theorems arose. Hence, as much as possible the course will be taught with an eye towards the historical significance of the mathematics being studied. One feature of the textbook I appreciate to this end is the Geometry Through History sections which "introduces students to the achievements of mathematicians of the past."

## II. COURSE MATERIALS AND REQUIREMENTS

### REQUIRED TEXT/RESOURCES

**Geometry Student Text (4th ed.)** ISBN 978-1606828946, The print or e-text is fine. Both can be ordered from BJU press here: <http://www.bjupress.com/product/299099> Be sure to look under "Additional Formats." The e-text is less expensive than the printed text. Both can be purchased together for a minor discount.

**Scientific Calculator** Texas Instruments TI-36X Pro. Can be purchased [on amazon](#). This is the calculator I will be using in class, so it is highly recommended that you get this calculator. If you cannot obtain this calculator, then any scientific calculator will do. If you already have a graphing calculator, then that is

## TENTATIVE COURSE SYLLABUS

fine. I will most likely be using a free online graphing utility ([www.desmos.com](http://www.desmos.com)) for our graphing needs in the course.

### REQUIRED SOFTWARE/FUNCTIONS

**The Ability to Scan/Upload Assignment Work as a PDF** This can be achieved by either 1 of 2 ways:

1) By scanning and uploading your handwritten work. If you have a smartphone or tablet with a camera, then you can get the [FREE Adobe Scan App](#). It is available on android and apple smartphones. This powerful app allows you to take a picture of your handwritten work and will automatically convert it into a PDF. From there you can email the document to yourself to access on your computer for upload. Alternatively, you can also use a modern scanner to scan multiple pages to your computer and save as a PDF. I have an HP printer/scanner and use the HP Scan and Capture application.

2) By either using [Microsoft Word Online](#) or [Google Docs](#). Please don't purchase the full Microsoft Word if you don't already have it. Using either of these FREE applications the student can type up their homework and convert to a PDF for upload. However, it will be difficult to complete and turn in some problems with this method, and mathematics is best practiced the old-fashioned way, with pen and paper. Because of this the first option is highly recommended.

If for some reason neither of these options are attainable by the student, then please contact me and we will see if we can find a comparable solution.

### III. COURSE OBJECTIVES

By the end of the course the student will be able to:

- A. Recall basic definitions and give descriptions of terms that form the foundation of geometry (such as point, line, and plane)
- B. Use the foundational terms and definitions of geometry to describe and construct two and three-dimensional figures
- C. Describe the difference between deductive and inductive reasoning.
- D. Recall the definition of statements and be able to evaluate the truth value of these statements
- E. Understand how inductive and deductive reasoning is related to Algebraic and Geometric proofs
- F. Prove various theorems related to parallel and perpendicular lines, angles, triangles, and other geometric figures
- G. Use the indirect proof technique to prove a postulate or theorem.
- H. Find the area of various geometric figures
- I. Employ the Pythagorean theorem and give a Geometric proof for the Pythagorean theorem.
- J. Find the surface area and volume of various three-dimensional figures
- K. Manipulate geometrical figures using transformations and symmetry
- L. Use the basic trigonometric identities to solve triangles
- M. Manipulate vectors
- N. Describe the historical context and problems out of which some of the mathematics learned in this class arose
- O. Describe how various mathematical applications or observations serve as evidence for the existence of God

## IV. COURSE REQUIREMENTS

## OVERVIEW

The students must have a means to upload homework in document form. This can be achieved by either using a word processor with an equation editor (such as Google Documents or Microsoft Word Online), or by scanning and uploading handwritten work. See "Required Text/Resources" section above. One advantage of having the electronic version of the text book is that one can take screen clippings of the homework questions and paste them into a document. All uploaded documents must be submitted as PDFs. It is expected that all work be displayed clearly in organized fashion. In class I will show you how I expect you to display your work for different problems.

In order to meet the above course objectives, the following course requirements have been adopted for this course:

- A. **Textbook Reading and Attendance:** The student is required to attend all classes. If for some reason the student is unable to attend class, then his or her parents must email me prior to class at [MrKilian@ApologiaOnlineAcademy.com](mailto:MrKilian@ApologiaOnlineAcademy.com) notifying me of the absence. While I will not be keeping attendance, the student will be required to give an attendance statement at the end of the course using the appropriate activity on the Canvas course page. On your honor, the statement should report your attendance as a SINGLE percentage. For example, "I attended 95% of the classes." Estimating is fine.

The student should thoughtfully and prayerfully read through the sections assigned in the class textbook in order to fully understand the concepts presented. A brief statement of completion will be made at the end of the course using the appropriate activity on the Canvas course page. On your honor, simply state the percentage of the assigned textbook read as a single percentage. For example, "I read 90% of the assigned reading." Do not itemize percentages. For example, do NOT say "I read 90% of Chapter 1, 75% of Chapter 2, etc." A SINGLE percentage for the entirety of the reading is fine.

EXTRA-CREDIT: Upload your notes for each unit covered in class to earn up to five points to your final course grade. That's right, 5 whole percentage points. Please upload as a PDF. Notes should be submitted to the appropriate activity on the Canvas course page at the end of the course. For full credit, notes should be organized, thorough, and cover each unit discussed in class.

- B. **Homework Assignments:** Problems will be handpicked from the textbook for each lesson as homework. These are due each Friday, but to take full advantage of the course lectures, they should be completed prior to the next class. The purpose of the homework assignments is to provide occasions whereby students can practice what is discussed in class and what is read from the textbook. There will be activities on Canvas wherein students will, on their honor, indicate whether or not they have completed the assigned homework. Students will be required to upload the completed problems in the activity as well. If a student indicates that he or she has completed the homework, but no evidence of said completion has been uploaded, then no credit will be given. We will go over how to complete these activities in class. Please upload completed homework as a PDF.

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- C. **Quizzes:** There will be short quizzes due each Friday (unless otherwise specified). These quizzes are timed and consist of two or three problems from the material covered for that week. Their purpose is to provide a low-risk opportunity for the student to demonstrate his or her comprehension of the material. Students are to complete them using the appropriate activity on the Canvas course page. **For full-credit, all work must be uploaded and clearly display each step in the process to the answer.** If I cannot see how an answer is achieved from the work given, even if the answer is correct, full-credit will NOT be given.
  
- D. **Exams:** There will be an examination at the end of each unit (unless otherwise specified). The purpose of the examination is to assess the student’s comprehension of the unit, and to demonstrate that comprehension by completing various problems discussed from the unit. Students are to complete the exams using the appropriate activity on the Canvas course page. As with the quizzes, **all work must be uploaded and clearly display each step in the process to the answer.** If I cannot see how an answer is achieved from the work given, even if the answer is correct, full-credit will NOT be given.

**Grade Distribution**

Assessment	Percentage of Total Grade
Textbook Reading and Attendance	10%
Homework Assignments	20%
Quizzes	30%
Exams	50%

Grading Scale: 90-100% A, 80-89% B, 70-79% C, 60-69% D, <60% Fail

**V. OUTLINE OF THE COURSE & TENTATIVE COURSE SCHEDULE**

**Coming Soon...**

**VI. MISCELLANEOUS POLICIES**

- A. It is the student’s and parent’s responsibility to read and comprehend the information in this syllabus; it is expected that the student will abide by the requirements presented in this syllabus.
  
- B. At my discretion I may deviate from this syllabus if it is necessary to accomplish the goals of the class. I will communicate any change to the class if it is determined to be necessary to do so and said communication will be done so in class and/or via email.

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- C. The student is responsible for taking his or her own notes during the lectures to personally use to study for the examinations. The student, on his or her honor, may NOT use any resource during an examination, including his or her textbooks or notes unless otherwise specified.
- D. Any matter or circumstance that is not addressed in this syllabus, and is related to this course, is at my discretion to decide upon.

## XI. MEET THE TEACHER



Mr. Kilian received his Bachelor of Science in Mathematics (with Secondary Education Certification) from Lewis-Clark State College along with a teaching endorsement and recently completed a Master of Arts in Philosophy at Southern Evangelical Seminary (SES). He is also beginning work on a PhD in Higher Education Administration. He has over four years of experience tutoring various levels of high school and college math, and he currently works for the online education department at SES as an instructional designer. Levi has been happily married to his high school sweetheart, Kyndra, for six years, and they are expecting their first baby in May 2018. In his free time, Levi likes to read, write, teach, and think deeply about Christian apologetics and philosophy. He also enjoys spending time with friends and family, playing games, eating good food, and camping.