

Math 442: Trigonometry and Precalculus

2018-2019 Syllabus

Part 1: Course Information

Instructor Information

Instructor: Aaron Ginsburg

Office: Room 218 (Across from the Math Center Room 217)

Tentative Office Hours:

| Monday | Tuesday | Wednesday | Thursday | Friday |
|------------------------|------------------------|--|--|--|
| 7 th Period | 6 th Period | 5 th Period 7 th Period | 3 rd Period 5 th Period | 3 rd Period 4 th Period 6 th Period |

School Day Tutoring in the Math Center Room 217: 5-6 Periods Daily, Check the Schedule

Telephone: 917-721-2500 (Not Direct) Ext. 3633

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Course Description

4 periods per week, 1 credit

This course begins with an in-depth study of trigonometry, including right triangle trigonometry, trigonometric graphs, identities, and equations. A brief unit in statistics, which explores standard deviation and the normal curve, is followed by investigations into topics in precalculus, including functions, transformations, polynomials, sequences, and series.

Prerequisite

- Successful completion of Math 432

Course Materials

Required

- Google Classroom/Khan Academy/Delta Math Accounts
 - Google Classroom enrollment, Khan Academy, and Delta Math accounts will be set-up in class through student SHS email accounts and account for a majority of the course content.
- OpenStax Digital Textbook, Precalculus, Abramson et al.
 - <https://openstax.org/details/books/prec calculus>

Recommended Self-Paced Practice

- Algebra and Trigonometry, Blitzer; Pearson (Textbook available upon request)

Course Supplies/Access

- **Scientific Calculator**
- A 3-ring binder with graphing paper/notebook and a folder
- Pencils and Erasers
- Desmos (www.desmos.com and Desmos App for iPhone or Android devices)
- Remind (Remind App for iPhone or Android devices)
- Internet connection (via a computing device at home/library or through mobile data)
 - Access to the Internet for assignments, posted notes, solution sets, review and additional resources is important and necessary.

Part 2: Student Learning Outcomes

- Quantities and Variables
 - How can quantities best be represented when analyzing relationships as quantities change?
- Functions
 - Why are functions important? How do key features of parent functions help explain relations across functions of the same form?
- Multiple Representations
 - What makes one representation of a function better suited to a problem than another?
- Rate of Change
 - How does a function's rate of change determine characteristics that uniquely define the function?
- Zeros
 - Why are zeros, where $f(x) = 0$, key points in the patterns of functions? How does the structure of a function's graph and equation give insights into its zeros?
- Modeling
 - Which models best help analyze a situation? How do we assess the effectiveness of a model?

Students will meet the objectives listed above through a combination of the following:

- Attend all scheduled classes
- Complete all assignments with honesty and effort
- Participate openly in the course content

Part 3: Course Outline and General Topics

- **Functions Review**
 - Functions and Function Notation, Domain and Range, Rates of Change, Behavior of Graphs, Transformation of Functions, Inverse Functions
- **Trigonometric Functions and Angles**
 - Circles, Angles, Rotations, Unit Circle, Points on Circles using Sine and Cosine, The Other Trigonometric Functions, Right Triangle Trigonometry
- **Periodic Functions**
 - Sinusoidal Graphs, Vertical and Horizontal Shifts of Sinusoidal Graphs, Frequency, Period, Graphs of the Other Trigonometric Functions, Inverse Trigonometric Functions, Solving Trigonometric Equations, Modeling with Trigonometric Equations
- **Trigonometric Equations and Identities**
 - Solving Trigonometric Equations with Identities, Addition and Subtraction Identities, Trigonometric Expressions
- **Applications of Trigonometry**
 - Law of Sines and Cosines, The Area Formula of a Triangle
- **Statistics**
 - Summation Notation, Measures of Central Tendency, Standard Deviation, The Normal Distribution, Z-Score, Statistical Inference and Reasoning, Modeling Data
- **Sequences and Series**
 - Arithmetic and Geometric Sequences, Recursive Notation, Arithmetic and Geometric Series, Infinite Series, Compound Interest
- **Functions**
 - One-to-one Functions, Composition of Functions, Domain and Range of Composition of Functions, Algebra of Functions, Graphing of Functions, Linear Functions, Average Rate of Change
- **Polynomial and Rational Functions**
 - Power Functions, Polynomial Functions, Even and Odd Functions, Quadratic Functions, Graphs of Polynomial Functions, Function Behavior, Factor and Remainder Theorem, Real Zeros of Polynomials, Rational Functions, Inverses and Radical Functions

Part 4: Grading Policy

Graded Course Activities

All assignments have the potential to have points awarded and recorded for the overall grade. Typical types of assignments are classwork, homework, pop-quizzes, quizzes, labs, tests, and projects. The points awarded will weight the assignment grade. For example, if a single homework is worth 5 points, a test may be worth 50 points.

Late Work Policy

Be sure to please pay close attention to deadlines. There is little acceptable discussion to make up assignments, quizzes, or late work without some form of prior notification (notification on the assignment due date is not prior) or a serious and compelling reason and approval.

Viewing Grades

Using the current school system we cannot push individual grade reports out through the portal. Grades are available upon student request and assignment reports are frequently printed and distributed in class.

Final

- **Seniors:** Students may be exempt from the Senior Final in Math 442 by either maintaining the achieved letter grade of the first semester in the second semester (B- or above) or by achieving a higher letter grade in the second semester compared to the first semester (C+ through C-). The final in Math 442 is worth 15% of the overall course grade if it were to decrease the average or 20% if it were to increase the average.
- **Juniors:** All juniors will take the Math 442 Final. The final in Math 442 is worth 15% of the overall course grade if it were to decrease the average or 20% if it were to increase the average.

Letter Grade Assignment

Final grades assigned for this course will be based on the percentage of total points earned and are assigned as follows:

| Letter Grade | Min Percentage | Progress Level |
|--------------|----------------|---------------------|
| A+ | 97% | Exceeding |
| A | 93% | |
| A- | 90% | |
| B+ | 87% | Meeting |
| B | 83% | |
| B- | 80% | |
| C+ | 77% | In Progress |
| C | 73% | |
| C- | 70% | |
| D+ | 67% | Limited Progress |
| D | 65% | |
| F | <65% | Not Yet in Progress |

Part 5: Course Policies

Attend Class

Students are expected to attend all class sessions. Necessary absences and the loss of seat-time can be assisted through email contact and by checking out course content via Google Classroom.

Participate

Ask questions. Be curious. Students will have moments to question and comment on content in class, but also outside of class using the Google Classroom platform. Thoughts, questions, and conjectures provide the discourse to establish reasoning.

Build Rapport

If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let me know as early as possible. As you will find, building rapport and effective relationships with your peers and teachers are key to becoming an effective student. Make sure that you are proactive in informing me (or any of the school support team) when difficulties arise during the semester so that we can help you find a solution.

Complete Assignments

Some assignments for this course may require an online submission. For example, if we have an online homework assignment, the online submissions are date-time stamped and will automatically be marked as late past the given due date. Assignments must be submitted by the given deadline or special permission must be requested from me *before the due date*. Late or missing assignments will affect the student's grade.

Commit to Integrity

As a student in this course you are expected to maintain high degrees of academic integrity, commitment to active learning, participation in this class, and also integrity in your behavior in and out of the classroom.