



Instructor: Mr. Patterson (Room 804)

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Course Scope

This one-year senior level course is the study of advanced mathematical topics and their applications to prepare students for college-level mathematics. Emphasis will be on refining problem solving skills through modeling and project based learning. Technology, including graphing calculators and computer software, will be used throughout the course. The prerequisite for this course is successful completion of second-year Algebra. This course will fulfill one of the mathematics credits required for high school graduation.

Quarter #1 (1) Set Theory, (2) History of Mathematics & Numbers, & (3) Number Theory

Quarter #2 (4) Probability, (5) Graph Theory, & (6) Geometry

Quarter #3 (7) Non-Euclidean Geometry, (8) Linear Algebra, & (9) Transformational Geometry

Quarter #4 (10) Game Theory, (11) Excursions, & (12) Apportionment/Voting

Course Goals

The Goals of the course are:

- To examine mathematics from historical and cultural perspectives.
- To explore trigonometric functions and their applications in problem solving, including triangle trigonometry and circular functions.
- To solve network problems involving optimum paths and conflict resolution using graph theory.
- To understand the connections between all aspects of the statistical process, including data collection, experimental and survey design, analysis, and drawing conclusions.
- To explore and expand concepts of probability and to solve problems involving real-world applications.
- To explore and expand geometric concepts and to solve problems involving transformations, tiling, and non-Euclidean geometry.
- To explore and apply the methods of game theory to business and the social sciences.
- To explore and apply methods of linear algebra, including matrices, linear programming, optimization, encryption, and transformational geometry.
- To develop and apply the concepts of elementary number theory, including Euclidean algebra, sequences and series, modular arithmetic, and prime numbers.
- To examine the characteristics and behavior of functions and relations.
- To analyze and solve problems in logic, including the use of truth tables and Venn diagrams.
- To explore various techniques of problem solving using inductive and deductive reasoning.

Required Class Materials

- **TI 83 or TI 84 (Graphing Calculator is strongly suggested!!)**
- Writing Tool (Pencil or Pen)
- 3 Ring Binder with paper (Possible Tabs - Notes, Homework, Tests/Quizzes)

Grading

A (100 - 90) B (89.9 - 80) C (79.9 - 70) D (69.9 - 60) F (59.9 - 0)

Semester Grade Breakdown

Quarter 1	40%	Quarter 2	40%	Semester Exam	20%
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Quarter Grade Breakdown

Tests/Quizzes/Projects 65% Homework 35%

This class will certainly have the typical things like tests, quizzes and homework but it is expected that other types of evaluations will also take place. We will be doing projects, power-point presentations, posters, presentation, oral reports, research papers... etc. It is the intent of this class for the topics to be higher level, interesting and engaging.

Student Behavior

(1) Absence from Class

You are responsible for what you have missed. Go to a friend to get the notes and the assignment from the class. If you know that you are going to be away contact me so that I can inform you what will happen.

(2) Absence from a Homework/Quiz/Test

If you are absent from class see me within 3 days after your return to school and then you have 3 days to complete the missing work. (Reg. #5113)

(3) Cheating

Cheating in any way will not be tolerated. A zero will be given, and a phone call home will be made.

(4) Homework Policy

Homework is due when asked for (not later in that day or period). Constant effort on your homework will make the greatest impact on your mathematical understanding and confidence.

(5) Late Assignment Policy

On homework assignments you will receive a maximum of 50% for being late. This rule does not apply if the answers have already been given out. If answers have been given out, there will be no points given to the students. On large projects or assignments you will receive 20% for being late.

Citizenship Grade

Unsatisfactory – A student that is a disruption to the classroom and its environment.

Satisfactory – A student that is respectful and studious.

Outstanding – This is given to students who take an active part of learning. These students are willing to participate in class, answer questions, be willing to demonstrate work, and support the classroom environment through active participation. This is an outstanding student. The grade is not the indicator for an outstanding student; it is effort and participation.

Extra Credit Policy

From time to time, students who demonstrate truly deep mathematical thought or hand in exceptional work due to an obvious amount of extra effort and work will be rewarded with additional points to further support such behavior. This is my 'bonus' reward.

What I do not participate in is providing 'extra' credit or 'bonus' work for students to raise a grade. If a student wants to raise a grade, he should gain a greater understanding of the concepts by coming in after school to get help from me..... or study and prepare for the next test or quiz... or do extra homework questions to increase speed and understanding of the material.... **IN OTHER WORDS, STUDENTS WHO WISH TO RAISE THEIR GRADES SHOULD TRY APPLYING A MORE STUDIOUS BEHAVIOR AND COMMITMENT TO MATHEMATICS INSTEAD OF LOOKING FOR SOME QUICK FIX!!!**