

MATHEMATICS DEPARTMENT

Contact Information

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The Department's Educational Philosophy

The study of mathematics will enhance the ability of all students to problem solve and to reason. Through a strong standardized departmental program that emphasizes problem solving, communicating, reasoning and proof, making connections, and using representations, students will develop self-confidence and a positive attitude towards mathematics.

Our curriculum matches that of the Massachusetts Mathematics Curriculum Framework, and we are philosophically aligned with the National Council of Teachers of Mathematics Standards.

Guiding Principles

- Mathematical ideas should be explored in ways that stimulate curiosity, create enjoyment of mathematics, and develop depth of understanding.
- Effective mathematics programs focus on problem solving and require teachers who have a deep knowledge of the discipline.
- Technology is an essential tool in a mathematics education, and all students should gain facility in using it where advantageous.
- All students should have a high-quality mathematics program.
- Assessment of student learning in mathematics should take many forms to inform instruction and learning.
- All students should understand the basic structure of mathematics.
- All students should recognize that the techniques of mathematics are reflections of its theory and structure.
- All students should gain facility in applying mathematical skills and concepts.
- All students should understand the role of inductive and deductive reasoning in mathematics and real life situations.

PROBABILITY AND STATISTICS: COURSE #346

(Alternate Year Offering: See the Program of Studies)

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Course Frequency: Semester course, five times per week

Credits Offered: Two and a half

Prerequisites: B- in Algebra II AE or Algebra II H

Background to the Curriculum

This unlevleed course has been offered for many years using a variety of texts, most recently the Discrete Mathematics portion of the text Advanced Mathematics, Brown, 2004, and Introductory Statistics and Probability, Blakeslee et al, 1988. It was revised in 2006 to provide an introduction to the course topics covered in an Advanced Placement Statistics class, with Probability topics included.

The purpose of this first semester is to allow students to obtain an introductory background into Discrete Mathematics topics.

Core Topics/Questions/Concepts/Skills

- Basic Terminology
- Exploring Data
- Exploring Relationships between Variables
- Gathering Data
- Randomness and Probability

Course-End Learning Objectives

<u>Learning objectives</u>	<u>Corresponding state standards, where applicable</u>
1] Understand how to describe data.	Algebra II D1
2] Describe distributions.	Algebra II D1
3] Use standard deviation and variance.	Precalculus D4
4] Apply the normal distribution model to work with standardized variables.	Precalculus D5
5] Use scatter plots to help determine association or correlation.	Precalculus D2
6] Use linear regression where appropriate.	Precalculus D2
7] Understand outliers and influential points.	Precalculus D2
8] Straighten relationships using logarithms.	Precalculus D2
9] Understand randomness.	Precalculus D1
10] Sample surveys.	Precalculus D1
11] Design experiments and observational studies.	Precalculus D1
12] Understand probability definitions.	Algebra II D2
13] Use probability rules – multiplication and addition.	Algebra II D2
14] Understand and use conditional probability, independent events, disjoint events.	Algebra II D2
15] Use tree diagrams and Baye’s rule.	Precalculus D5
16] Use random variables and find their variance.	Precalculus D5
17] Use probability models – binomial model, geometric model, and contrast with normal model.	Precalculus D5

Assessment

Students are generally assessed by in class exams and quizzes.

Technology and Health Learning Objectives Addressed in This Course

(This section is for faculty and administrative reference; students and parents may disregard.)

<u>Course activity: skills &/or topics taught</u>	<u>Standard(s) addressed through this activity</u>
1] Students will use the T183 extensively to obtain relevant information.	

Materials and Resources

Stats, Modeling the World, David Bock, Pearson Education Company, 2007.