

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 mathematic and real life situations.

PROBABILITY AND STATISTICS: COURSE #346

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

Students will be able to:

- 1] Understand how to describe data.
- 2] Describe distributions.
- 3] Use standard deviation and variance.
- 4] Apply the normal distribution model to work with standardized variables.
- 5] Use scatter plots to help determine association or correlation.
- 6] Use linear regression where appropriate.
- 7] Understand outliers and influential points.
- 8] Straighten relationships using logarithms.

- 9] Understand randomness.
- 10] Sample surveys.
- 11] Design experiments and observational studies.
- 12] Understand probability definitions.
- 13] Use probability rules – multiplication and addition.
- 14] Understand and use conditional probability, independent events, disjoint events.
- 15] Use tree diagrams and Baye’s rule.
- 16] Use random variables and find their variance.
- 17] Use probability models – binomial model, geometric model, and contrast with normal model.

Assessment

Students are generally assessed by in class exams and quizzes.

Technology Learning Objectives Addressed in This Course

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

Course activity: skills &/or topics taught

- 1] Students will use the T183 extensively to obtain relevant information.

Materials and Resources

Text: “Discrete Mathematics” portion of Advanced Mathematics, Brown, 2004
and Introductory Statistics and Probability, Blakeslee et al, 1988.

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