College of the Holy Cross, Spring Semester, 2021
Math 375, Section 01 (Professor Hwang)
Course Information Sheet

Contact Information

Office Hours: M 10:30-11:20, R 9:15-11:20, or by appointment
email: `ahwang -at- holycross -dot- edu`
web: `http://mathcs.holycross.edu/~ahwang/teach/375/index.html`

Office hours provide a chance for you to clarify difficult concepts, work through examples, discuss academic issues, discover applications of the course material, or just chat. You are making good use of my time by coming to office hours! Please send email to make an appointment. If a problem arises with the course, see me as soon as possible. The sooner we talk, the easier it is to get you back on track in the course.

About the Course

Probability is the mathematical study of quantified uncertainty. We use set theory to enumerate possible outcomes, assign numerical weights to individual outcomes and collections of outcomes, and calculate within this framework to model likelihood.

The mathematical ideas and techniques draw heavily on calculus of one and several variables, but also on the algebra of vectors and dot products.

Grading

The course grade has four components: Attendance and participation, problem sets, midterm tests, and the final exam.

Attendance and Participation Because we are working remotely, it's crucial that you come to class, ask questions, and generally take an active role in your learning. Attendance counts for 15% of your grade, prorated for unexcused absences.

Problem Sets There are ten problem sets throughout the semester, worth 10% of your grade in total, consisting of problems from the textbook. These are normally due Mondays, in Moodle, at **noon sharp**.

Midterms There are three in-class midterm tests, scheduled for Friday, March 5; Wednesday, March 31; and Monday, April 26. In total, the midterms count for 55% of your grade: The best two scores count 20% each, the lowest is worth 15%. If you have a midterm conflict due to an athletic event, illness, or a family emergency, notify me and your Class Dean immediately.

Final Exam The cumulative final exam is worth 20% of the course grade. The College has not yet scheduled the final exam.

Academic Integrity

Like all Holy Cross faculty, I strongly support the College's Policy on Academic Integrity, which is detailed in the catalog. It is **your responsibility** to read and follow this policy. Plagiarism and cheating are violations of my trust in you, and undermine the entire academic enterprise, which is founded on honesty and factual accuracy.

Meeting Schedule

The following is the syllabus for the term. Please see Moodle for a more detailed list of topics. Any substantial variations from this schedule will be announced by email or in class.

M	Feb 1	Section 2.1-2.3	Set Theory
W	Feb 3	Section 2.4	Sample Spaces and Events
F	Feb 5	Section 2.5-6	Probability Axioms and Properties
M	Feb 8	Section 2.6	Techniques for Counting
W	Feb 10	Section 2.7-8	Conditional Probability and Independence
F	Feb 12	Section 2.9-11	Bayes' Rule, Discrete Random Variables
M	Feb 15	Section 3.1-2	Probability Mass Functions
W	Feb 17	Section 3.3	Expected Value, Variance
F	Feb 19	Section 3.4	Binomial Distributions
M	Feb 22	Section 3.5	Geometric Distributions
W	Feb 24	Section 3.6	Negative Binomial Distributions
F	Feb 26	Section 3.7	Hypergeometric Distributions
M	Mar 1	Section 3.8	Poisson Distributions
W	Mar 3	Section 3.9	Moment Generating Functions
F	Mar 5		**Midterm 1**
M	Mar 8	Section 4.1-3	Continuous Random Variables, Expected Value
W	Mar 10	Section 4.4-5	Uniform and Normal Distributions
F	Mar 12	Section 4.6	Gamma Distributions
M	Mar 15	Section 4.7	Beta Distributions
W	Mar 17	Section 4.10	Chebyshev's Inequality
F	Mar 19	Section 5.1-2	Joint Distributions
M	Mar 22	Section 5.3	Marginal Distributions
W	Mar 24	Section 5.4	Independence
F	Mar 26	Section 5.5-6	Expected Value of a Function
M	Mar 29	Section 5.7-8	Covariance and Linear Combinations
W	Mar 31		**Midterm 2**
F	Apr 2		Easter
M	Apr 5		Easter
W	Apr 7	Section 5.9	Multinomial Distribution
F	Apr 9	Section 5.10	Bivariate Normal Distribution
M	Apr 12	Section 5.11	Conditional Expectations
W	Apr 14	Section 6.1-3	Method of Distribution Functions
F	Apr 16	Section 6.4	Method of Transformation
M	Apr 19	Section 6.5	Method of Moment Generating Functions
W	Apr 21	Section 6.6	Jacobians
F	Apr 23	Section 6.7	Order Statistics
M	Apr 26		**Midterm 3**
W	Apr 28		Academic Conference
F	Apr 30	Section 7.1-2	Sampling Distributions
M	May 3	Section 7.2	Sampling Distributions
W	May 5	Section 7.3	The Central Limit Theorem
F	May 7	Section 7.4	Proof of the Central Limit Theorem