

2023-2024

Probability/Statistics/Discrete Course Guide

#2243/2244 Prob/Stat/DM

Course Description

This is a one-year non honors level course designed to provide students with opportunities to explore concrete concepts, probability, statistics and discrete mathematics. The first semester is spent studying set theory, probability and statistics; experimental design, sampling techniques, distributions, measures of center, spread and position. Students will be provided with opportunities to collect and analyze data relevant to students and draw conclusions based on this analysis. The second semester will involve a confidence intervals, hypothesis testing, correlation, linear regression, linear programming, finance, and number representations. Throughout the course, emphasis will be given to providing students with numerous opportunities to model problem situations using hands-on materials, graphing calculators, and computers. The pre-requisite into this class is passing both semesters of Algebra 2.

Probability/Statistics/Discrete Math

Prob/Stat/DM – Semester 1		
Topic		Resource
Unit 1 3 weeks	Basic Set Concepts Subsets Venn Diagrams and Set operations Set operations and Venn Diagrams with three sets Survey problems	Chapter 2 Thinking Mathematically
Unit 2 3.5 weeks	The fundamental counting principal Permutations and Combinations Fundamentals of probability Probability with the counting Events involving NOT and OR Events involving AND Conditional probability	Chapter 11 Thinking Mathematically
Unit 3 2 week	Overview of statistics Data classification (no Levels of Measurement, students need Types of Data only) Experimental design	Chapter 1.1-1.3 Elementary Statistics
Unit 4 2.5 weeks	Frequency distributions and their graphs More graphs and displays Measures of central tendency, spread and position	Chapter 2.1-2.5 Elementary Statistics
Unit 5 1 week	Probability distributions Binomial distributions Expected value	Chapter 4.1-4.2 Elementary Statistics
Unit 6 4 weeks	Normal distributions Normal distributions: finding probabilities Normal distributions: finding Values Sampling distributions and the Central Limit Theorem Normal approximation to Binomial distributions	Chapter 5.1-5.4, 5.5 Elementary Statistics

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Prob/Stat/DM – Semester 2		
Topic		Resource
Unit 7 3 weeks	Confidence Intervals for the mean (large samples) Confidence Intervals for the mean (small samples) Confidence Intervals for population proportions	Chapter 6.1-6.3 Elementary Statistics
Unit 8 3 weeks	Introduction to Hypothesis Testing Hypothesis Testing for the mean (large samples) Hypothesis Testing for the mean (small samples) Hypothesis Testing for proportions	Chapter 7.1-7.4 Elementary Statistics
Unit 9 2.5 weeks	Correlation Linear Regression (include the meaning of r^2 in this topic)	Chapter 9.1-9.2, r^2 - p.499 Elementary Statistics
Unit 10 4 weeks	Percent, sales tax, and income tax Simple interest Compound interest Annuities, stocks and bonds (Introduce Stocks and Bonds but leave out the mathematics of them) Installment buying Amortization and the cost of home ownership	Chapter 8.1-8.6 Thinking Mathematically
<i>options for final five weeks</i>		
Unit 11 3 weeks	Graphs, Paths and Circuits Euler Paths and Euler Circuits Hamilton Paths and Hamilton Circuits Trees	Chapter 14.1-14.4 Thinking Mathematically
Unit 12 2 weeks	Number bases in positional systems Computation in positional systems	Chapter 4 Thinking Mathematically
Unit 13 5 weeks	Statements, Negation and Quantified Statements Compound Statements and Connectives Truth Tables for Negation, Conjunction and Disjunction Truth Tables for the Conditional and Biconditional Equivalent Statements, Variation of Conditional Statements and DeMorgans Laws Arguments and Truth Tables Arguments and Euler Diagrams	Chapter 3 Thinking Mathematically