

MATH 254 Probability & Statistics

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Course Description**Course Description**

Topics: data, central tendency, random variables, hypothesis testing, p-values, confidence intervals, the binomial, hypergeometric, Poisson, normal, Chi-square and student's t distributions, linear regression, contingency tables.

Offered: Quarter 4
 Credit: 3
 In-Class Workload: 4 hours
 Out-of-Class Workload: 3-6 hours

Prerequisites: Open to ENGBRIDGE students

Textbook

William Mendenhall , Robert J. Beaver Barbara M. Beaver, *Introduction to Probability and Statistics*, 11st Edition, Thomson (Brooks/Cole), 2003.

Evaluation

Assignments: 10% of Final Mark

Assignment is given weekly, it is due on Thursday. No late assignment is accepted. Solutions should be presented in a neat and clear fashion and the paper should be well organized and stapled at the top left corner if there is more than one page. Complete solutions will be posted.

Tests: 40% of Final Mark

There will be 2 midterm tests. There is **NO** makeup (medical excuse must be accompanied by a physician's note). Complete solutions will be posted.

Final Examination: 50% of Final Mark

The following percentage conversion to letter grade will be used:

0-49	50-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
F	D	C	C+	B-	B	B+	A-	A	A+

Mathlab

Extra help available from assistant at the Interurban Math Lab: TB 142

Outline**CHAPTER 0 Introduction: An Invitation to Statistics**

Text	Time	
0.1-0.3	1.0	The Population and the Sample, Descriptive and Inferential Statistics, Achieving the Objective of Inferential Statistics
Total	1.0	lecture hours

CHAPTER 1 Describing Data with Graphs

Text	Time	
1.1-1.2	1.0	Variables and Data, Types of Variables
1.3-1.4	1.0	Graphs for Categorical Data, Graphs for Quantitative Data
1.5	1.0	Stem and Leaf Displays, Interpreting Graphs with a Critical Eye, Relative Frequency Distributions
Total	3.0	lecture hours

CHAPTER 2 Describing Data with Numerical Measures

Text	Time	
2.1-2.2	1.0	Describing a Set of Data with Numerical Measures, Measures of Centre
2.3	1.0	Measures of Variability
2.4-2.7	2.0	On the Practical Significance of the Standard Deviation, A Check on the Calculation of s , Measures of Relative Standing, The Box Plot
Total	4.0	lecture hours

CHAPTER 4 Probability and Probability Distributions

Text	Time	
4.1-4.2	1.0	The Role of Probability in Statistics, Events and the Sample Space
4.3-4.3	1.0	Calculating Probabilities using Simple Event, Useful Counting Rules
4.5	1.0	Event Relations and Probability Rules
4.6	1.0	Conditional Probability, Independence, and the Multiplicative Rule
4.7	1.0	Bayes' Rule
4.8	1.0	Discrete Random Variables and Their Probability Distributions
Total	6.0	lecture hours

CHAPTER 5 Several Useful Discrete Distributions

Text	Time	
5.1-5.2	2.0	The Binomial Probability Distribution
5.3-5.4	1.0	The Poisson Probability Distribution, The Hypergeometric Probability Distribution
Total	3.0	lecture hours

CHAPTER 6 The Normal Probability Distribution

Text	Time	
6.1-6.2	1.0	The Normal Probability Distribution
6.3	1.0	Tabulated Areas of the Normal Probability Distribution
6.4	1.0	The Normal Approximation to the Binomial Probability Distribution
Total	3.0	lecture hours

CHAPTER 7 Sampling Distributions

Text	Time	
7.1-7.2	0.0	Sampling Plans and Experimental Designs
7.3	1.0	Statistics and Sampling Distributions
7.4	1.0	The Central Limit Theorem
7.5	1.0	The Sampling Distribution of the Sample Mean, Standard Error
7.6-7.7	1.0	The Sampling Distribution of the Sample Proportion, Control Charts
Total	4.0	lecture hours

CHAPTER 8 Large-Sample Estimation

Text	Time	
8.1-8.3	1.0	Statistical Inference, Types of Estimators
8.4	1.0	Point Estimation
8.5	1.0	Interval Estimation
8.6	1.0	Estimating the Difference between Two Population Means
8.7	0.5	Estimating the Difference between Two Binomial Population
8.9	0.5	Choose the Sample Size
Total	5.0	lecture hours

CHAPTER 9 Large-Sample Tests of Hypotheses

Text	Time	
9.1-9.2	1.0	A Statistical Test of Hypothesis
9.3	1.0	A Large-Sample Test of Hypothesis about a Population Mean, p-value
9.4	1.0	A Large-Sample Test of Hypothesis for the Difference between Two Population Means
9.5	1.0	A Large-Sample Test of Hypothesis for a Binomial Proportion
9.6	1.0	A Large-Sample Test of Hypothesis for the Difference between Two Binomial Proportions
Total	5.0	lecture hours

CHAPTER 10 Inference from Small Samples

Text	Time	
10.1-10.3	1.0	Student's t Distribution, Small-Sample Inferences Concerning a Population Mean
10.4-10.6	1.0	Small-Sample Inferences for the Difference between Two Population Means, Inferences Concerning a Population Variance
Total	2.0	lecture hours

CHAPTER 12 Linear Regression and Correlation

Text	Time	
12.1-12.3	1.0	The Method of Least Squares
12.7	1.0	Estimation and Prediction Using the Fitted Line
12.8	1.0	Correlation Analysis
Total	3.0	lecture hours

Lecture	39 hours
Leeway	1 hours
2 2-hour tests	4 hours
Total	44 hours