

Contents

1	Probability	5
1.1	Basic Concepts [2 hr]	5
1.2	Properties of Probability [2 hr]	7
1.3	Methods of Enumeration [1 hr]	9
1.4	Conditional Probability [1 hr]	11
1.5	Independent Event [1 hr]	12
1.6	Bayes's Theorem [1 hr]	13
2	Discrete Distributions	15
2.1	Random Variables of the Discrete Type [1 hr]	15
2.2	Mathematical Expectation [1 hr]	17
2.3	The Mean, Variance, and Standard Deviation [2 hr]	18
2.4	Bernoulli Trials and the Binomial Distribution [1 hr]	19
2.5	The Moment-Generating Function [2 hr]	20
2.6	The Poisson Distribution [1 hr]	21
3	Continuous Distributions	23
3.1	Continuous-Type Data [1 hr]	23
3.2	Exploratory Data Analysis [1 hr]	24
3.3	Random Variables of the Continuous Type [1 hr]	25
3.4	The Uniform and Exponential Distributions [1 hr]	26
3.5	The Gamma and Chi-Square Distributions [1 hr]	27
3.6	The Normal Distribution [1 hr]	28
3.7	Additional Models [0 hr]	29
4	Bivariate Distributions	31
4.1	Distributions of Two Random Variables [2 hr]	31
4.2	The Correlation Coefficient [1 hr]	32
4.3	Conditional Distributions [1 hr]	33

4.4	The Bivariate Normal Distribution [0 hr]	34
5	Distributions of Functions of Random Variables	35
5.1	Functions of One Random Variable [1 hr]	35
5.2	Transformations of Two Random Variables [1 hr]	36
5.3	Several Independent Random Variables [1 hr]	37
5.4	The Moment-Generating Function Technique [1 hr]	38
5.5	Random Functions Associated with Normal Distributions [1 hr]	39
5.6	The Central Limit Theorem [2 hr]	40
5.7	Approximations for Discrete Distributions [1 hr]	41
6	Estimations	43
6.1	Point Estimation [2 hr]	43
6.2	Confidence Intervals for Means [0 hr]	44
6.3	Confidence Intervals for the Difference of Two Means [0 hr]	45
6.4	Confidence Intervals for Variances [0 hr]	46
6.5	Confidence Intervals for Proportions [0 hr]	47
6.6	Sample Size [0 hr]	48
6.7	A Simple Regression Problem [0 hr]	49
6.8	More Regression [0 hr]	50