

COURSE SPECIFICATION

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	Course Title	Probability Theory			
2.	Originating Department	Department of Mathematics			
3.	Course Code	MA215			
4.	Credit Value	4			
5.	Course Type	Major Elective Courses			
6.	Semester	Fall			
7.	Teaching Language	English			
8.	Instructor(s), Affiliation & Contact For team teaching, please list all instructors	<div style="text-align: center;">701-09</div> chenay@sustc.edu.cn 0755-8801-8688 CHEN Anyue, Professor, Department of Mathematics Rm.701-09, Service Centre of Scientific Research and Teaching Bldg. chenay@sustc.edu.cn 0755-8801-8688			
9.	/ Tutor/TA(s), Contact	NA / To be announced			
10.	() Maximum Optional Enrolment				
11.	Delivery Method	/ /	/	()	
		Lectures	Tutorials	Lab/Practical	Other Please specify
	Credit Hours	48			48

17.

Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

Ch1. Introduction (3 hours): Introduction; Baby Set Theory; Combinatorial Methods; Binomial Coefficients; Binomial Theorems.
Ch2. Probability Measure (5 hours): Sample Spaces; Events; The Probability of an Event; Some Rules of Probability; Conditional Probability; Independent Events; Bayes's Theorem.
Ch3: Random Variables (10 hours): Random Variables; Probability Distributions; Discrete Random Variables; Probability Mass Functions; Binomial Random Variable; Poisson Random Variable; Other Discrete Random Variables; Continuous Random Variables; Probability Density Functions; Exponential Distributions; Normal Distributions; Gamma Distributions; Some Other Commonly Used Continuous Distributions; Function of a single random variable; Transformations; cdf methods.
Ch4: Random Vectors (8 hours): Multivariate Random Variables; Joint, Marginal and Conditional Distribution Functions; Independent Random Variables; Bivariate Normal Distributions; Multivariate Normal Distributions.
Ch5: Mathematical Expectations (10 hours): The Expected Value of a Random Variable; The Basic Properties of Expectations; The Variance of a Random Variable; Moments; Covariance and Correlation of Random Vectors.
Ch6: Functions of Random Variables (8 hours): Basic Concepts; Property of Expectation of Function of Random Variables; Distribution Function Techniques; Transformation Technique for One Variable; Transformation Technique for Several Variables; Generating Function Technique; Sum and Ratio of Two Random Variables; the Moment Generating Functions: properties and Applications.
Ch7 : Limit Theorems and Distributions Derived from the Normal Distribution (4 hours): The Law of Large Numbers, The Central Limit Theorems; Chi-Square Distribution, The T- and F- Distributions; The Sample Mean, The Sample Variance.

18.

Textbook and Supplementary Readings

Required : Rice, J.A., Mathematical Statistics and Data Analysis, Duxbury Press.
Recommended:
1. Douglas G. Kelly, Introduction to Probability, Macmillan Publishing Company, 1994, ISBN 0-02-363145-7
2 Sheldon Ross , A First Course in Probability, 4 th Ed, Macmillan Publishing Company, 1994, ISBN 0-02-403872-5

ASSESSMENT

19.

Type of Assessment	Time	% of final score	Penalty	Notes
Attendance				
Class Performance				
Quiz				
Projects				
Assignments		25%		
Mid-Term Test		25%		
Final Exam	2 hours	50%		

**Final
Presentation**

**Others (The
above may be
modified as
necessary)**

20.

GRADING SYSTEM

A.	Letter Grading
B.	/ Pass/Fail Grading

REVIEW AND APPROVAL

21.

/

This Course has been approved by the following person or committee of authority

--