

课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

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 leader.

1.	课程名称 Course Title	概率论与数理统计 Probability and Statistics
2.	授课院系 Originating Department	数学系 Department of Mathematics
3.	课程编号 Course Code	MA212
4.	课程学分 Credit Value	3
5.	课程类别 Course Type	通识通修 -- 必修 GE-Elective, Foundation
6.	授课学期 Semester	春季 Spring
7.	授课语言 Teaching Language	英文 English
8.	授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师） Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	Gabrielle Mary Jing, 统计与数据科学系 商学院大楼 324 gmjing@sustech.edu.cn Gabrielle Mary Jing, Department of Statistics and Data Science Rm.324, College of Business gmjing@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式（请列出本课所有教辅人员） Tutor/TA(s), Contact (Please list all)	孟德霖 12231287@mail.sustech.edu.cn 王晨凯 12232885@mail.sustech.edu.cn
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	

教学评估 ASSESSMENT

评估形式 Type of Assessment	评估所需时间 Duration	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10%		大课 19 次+习题课 13 次 = 32 次
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		10%		
期中考试 Mid-Term Test		30%		15:00-17:00 on April 8 (Saturday of the 8th week). No make-up test!
期末考试 Final Exam		50%		
期末报告 Final Presentation				
其它（可根据需要改 写以上评估方式） Others (The above may be modified as necessary)				

课程内容及教学日历 (course contents to be taught in order)

第 1 章 概率的基本概念 (7 学时)

样本空间、随机事件、概率测度、计数方法、条件概率、独立事件、贝叶斯公式

Chapter 1 Basic Concepts of Probability (7 hours)

sample spaces, random events, probability measures, probability calculation, conditional probability, independent event, Bayesian formula

第 2 章 随机变量 (7 学时)

离散型随机变量：概率分布函数，常见的离散型随机变量，如伯努利随机变量、二项分布、几何分布和负二项分布、超几何分布及泊松分布等。

Chapter 2 Random variables (7 hours)

discrete random variables: probability distribution function, Bernoulli random variables, Binomial distribution, geometric and negative binomial distribution, hypergeometric distribution, Poisson distribution

连续型随机变量：概率密度函数、常见的连续型随机变量，如均匀分布、指数分布、正态分布等。

Continuous random variables: probability density function, uniform distribution, exponential distribution, normal distribution

第 3 章 联合分布 (8 学时)

随机变量的联合累积分布函数、边缘累积分布函数。

离散型随机变量的联合概率质量函数、边缘概率质量函数。

连续型随机变量的联合密度函数，边缘密度函数。

独立随机变量、条件分布及联合分布的随机变量函数。

Chapter 3 Joint Distributions (8 hours)

Random variable, discrete random variable, continuous random variable, independent random variable, joint distribution

—————前三章为期中考试内容 (The first three chapters are the content of the mid-term)—————

第 4 章 期望 Expectation (6 学时)

随机变量的期望、方差和标准差、协方差和相关系数、条件期望。

Chapter 4 Expectation (6 hours)

Expected value, variance, standard deviation, correlation, correlation coefficient, conditional expected value

第 5 章 极限定理 (2 学时)

大数定律和中心极限定理

Chapter 5 Limit theorems (2 hours)

The law of large numbers, central limit theorem

第 6 章 数理统计的基本概念及抽样分布 (4 学时)

数理统计的基本概念：总体和样本、统计推断等。

样本分布，常用统计量。

t 分布，F 分布。

Chapter 6 Sampling distributions of estimates (4 hours)

Basic concepts of statistics: sample set and sample, statistic assumption

Sample distribution, commonly used statistics, t distribution, F distribution

第 7 章 参数估计 (6 学时)

点估计，区间估计

Chapter 7 Parametric estimation problems (6 hours)

Point estimation and interval estimation

第 8 章 假设检验 (6 学时)

单样本正态总体均值和方差的检验、两独立样本比较、配对样本比较。

Chapter 8 Testing hypothesis (6 hours)

Basic principles, specification of the significance level and the concept of NULL Hypothesis and alternative hypothesis

指定教材： Core text book

数理统计与数据分析, Mathematical Statistics and Data Analysis, John A. Rice, 3rd Ed.

推荐参考资料 Reference books:

1. Probability and Statistics, 5th edition, Jay L. Devore
2. 概率论与数理统计, 浙大版