

课程大纲 COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	MAT7102 概率统计专题 MAT7102 Topics in Probability and Statistics
2.	课程性质 Compulsory/Elective	专业选修课 Major Elective Courses
3.	课程学分/学时 Course Credit/Hours	3/48
4.	授课语言 Teaching Language	英文 English
5.	授课教师 Instructor(s)	邵启满 讲席教授 Chair Professor Qiman Shao
6.	是否面向本科生开放 Open to undergraduates or not	是 Open to undergraduates
7.	先修要求 Pre-requisites	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) 数理统计 (MA204) Mathematical Statistics (MA204)
8.	教学目标 Course Objectives	
	<p>本课程介绍了某些统计概念和概率统计方法, 这些概念和方法对研究生在准备研究论文时是非常有用的。该课程着重介绍最新的概率统计技术在实际中的应用以及它们的基本理论。</p> <p>This course introduces some basic concepts and methods in probability and statistics, which are potentially useful for graduate students in preparing their research papers in probability and statistics. Focus is on applications of state-of-the-art probability and statistical techniques and their underlying theory.</p>	
9.	教学方法 Teaching Methods	
	讲授 Lectures	
10.	教学内容 Course Contents	
	Section 1	基本的渐近方法: 收敛性; 大数定律; 中心极限定理; delta 方法; Edgeworth 展开。(6 hours) Basic asymptotic methods: convergence; stochastic orders; laws of large numbers; central limit theorems; delta method; Edgeworth expansions. (6 hours)
	Section 2	稳健方法: 稳健性度量; M 估计量; L 估计量; R 估计量。(6 hours) Robust methods: measures of robustness; M-estimator; L-estimator; R-estimator. (6 hours)
	Section 3	基本概率统计不等式。(10 hours) Fundamental inequalities in probability and statistics. (10 hours)
	Section 4	分布函数的逼近方法, 斯坦因方法。(13 hours) Approximation method for distribution functions, Stein's method. (13 hours)
	Section 5	学生化统计量的渐近性质。(13 hours) Asymptotic theory of studentized statistics. (13 hours)

	Section 6							
	Section 7							
	Section 8							
	Section 9							
	Section 10							
							
11.	课程考核 Course Assessment							
	<p>(①考核形式 Form of examination; ②.分数构成 grading policy; ③如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)</p> <table> <tr> <td>课堂表现 Class Performance</td> <td>10%</td> </tr> <tr> <td>平时作业 Assignments</td> <td>30%</td> </tr> <tr> <td>期末考试 Final Exam</td> <td>60%</td> </tr> </table>		课堂表现 Class Performance	10%	平时作业 Assignments	30%	期末考试 Final Exam	60%
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12.	教材及其它参考资料 Textbook and Supplementary Readings							
	<p>In this course, no single textbook can cover all the topics. Relevant references are as follows:</p> <p>[1] Shao, J. (1999). Mathematical Statistics. Springer: New York. [2]de la Pe~na, V., Lai, T. L., Shao, Q. M. (2009). Self-normalized Processes: Limit Theory and Statistical Applications. Springer Series in Probability and its Applications, Springer-Verlag, New York. [3]Chen, L. H. Y., Goldstein, L. and Shao, Q. M. (2011). Normal Approximation by Steins Method. Springer Series in Probability and its Applications, Springer-Verlag, New York. [4]DasGupta, A. (2008). Asymptotic Theory of Statistics and Probability. Springer: New York.</p>							