课程大纲
COURSE SYLLABUS

1.	课程代码/名称 **Course Code/Title**	MAT8023 群论及其应用 Group Theory and its Applications
2.	课程性质 **Compulsory/Elective**	专业核心课 **Compulsory**
3.	课程学分/学时 **Course Credit/Hours**	3 学分／48 学时
4.	授课语言 **Teaching Language**	English
5.	授课教师 **Instructor(s)**	华培策, 李才恒
6.	是否面向本科生开放 **Open to undergraduates or not**	面向本科生开放
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.） Abstract Algebra II, Permutation groups MAT8020 抽象代数 II, MAT7078 置换群
8.	教学目标 **Course Objectives**	

	（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.） 　　让学生熟练掌握群论及对称图论的基本知识、方法，及其主流问题和重要问题；通过学习有限单群分类定理，了解该领域的发展趋势。学生学习内容包括有限群的结构及群作用、有限域上的群表示论、有限典型群的子群、群在图上的作用、图的对称性以及凯莱图的同构问题。 Students are supposed to understand basic knowledge and methods of group theory and symmetric graph theory, as well as their mainstream and important problems. Students can also understand the development tendency of group theory by learning the classification of finite simple groups. The main content includes Structures and actions of finite groups，group representations over finite fields, subgroups of finite classical groups， group actions on graphs and graph symmetries, and isomorphism problems for Cayley graphs.		

9.	教学方法 **Teaching Methods**	
	（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.） 讲授, 讨论	

10.	教学内容 **Course Contents** （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.）	
	Section 1	有限群的结构和群作用 Structures and actions of finite groups (10 credit hours)
	Section 2	群在有限域上的表示 Group representations over finite fields (10 credit hours)
	Section 3	有限典型群的子群 Subgroups of finite classical groups (10 credit hours)
	Section 4	群在图上的作用和图的对称性 Group actions on graphs and graph symmetries (10 credit hours)

Section 5	Cayley 图的同构问题 Isomorphism problems for Cayley graphs (8 credit hours)

11.	课程考核 **Course Assessment**
	（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.） 半期考查 50%，期末报告 50%.

12.	教材及其它参考资料 **Textbook and Supplementary Readings**
	1. Lecture Notes on Symmetric graphs, by LI Cai Heng 2. The Finite Simple Groups, GTM 251, by Robert Wilson 3. Permutation Groups, by Peter Cameron. 4. Algebraic Graph Theory, by Norman Biggs