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 instructor.

1.	**课程名称 Course Title**	**群论及其应用 Group Theory and Its Applications**
2.	**授课院系 Originating Department**	数学系 Department of Mathematics
3.	**课程编号 Course Code**	MA440
4.	**课程学分 Credit Value**	3
5.	**课程类别 Course Type**	专业选修课 Major Elective Courses
6.	**授课学期 Semester**	秋季 Fall
7.	**授课语言 Teaching Language**	中英双语 English & Chinese
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）**	李才恒，教授，数学系 邮箱: lich@sustc.edu.cn 电话: 0755-88018755 Caiheng Li, Professor, Department of Mathematics email: lich@sustc.edu.cn phone: 0755-88018755
9.	**实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact**	无 NA / 待公布 To be announced / 已确定的实验员/助教联系方式 Please list all Tutor/TA(s) **（请保留相应选项 Please only keep the relevant information）**
10.	**选课人数限额(可不填) Maximum Enrolment （Optional）**	

11.	授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
	学时数 Credit Hours	48				48

12.	先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	抽象代数 Abstract Algebra
13.	后续课程、其它学习规划 Courses for which this course is a pre-requisite	
14.	其它要求修读本课程的学系 Cross-listing Dept.	

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

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 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.

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.

16. 预达学习成果 Learning Outcomes

为学生进入群论及其相关领域的研究工作打下基础，掌握必要的知识和技能。通过对有限单群分类定理的学习，以及有限单群在对称图、表示论等方向中的应用，对前沿的发展动态有所了解，找到适当的研究问题并解决。

Lay the foundation of the research of group theory and related areas. Understand frontier development trend of group theory by learning the classification of finite simple groups and its applications on symmetric graphs and representation theory. Find and try to solve some research problems.

17. 课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）

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.)

1. 有限群的结构和群作用 Structures and actions of finite groups (10 credit hours)
2. 群在有限域上的表示 Group representations over finite fields (10 credit hours)
3. 有限典型群的子群 Subgroups of finite classical groups (10 credit hours)
4. 群在图上的作用和图的对称性 Group actions on graphs and graph symmetries (10 credit hours)
5. Cayley 图的同构问题 Isomorphism problems for Cayley graphs (8 credit hours)

18. **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

课程评估 ASSESSMENT

19.

评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance				
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects		50		
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam	2 小时	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)				

20. **记分方式 GRADING SYSTEM**

☑ A. 十三级等级制 **Letter Grading**
☐ B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. **本课程设置已经过以下责任人/委员会审议通过**
This Course has been approved by the following person or committee of authority