

课程大纲

COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	MAT7079 代数图论 Algebraic Graph Theory
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	3/45
4.	授课语言 Teaching Language	中英双语 English & Chinese
5.	授课教师 Instructor(s)	李才恒, 教授, 数学系 慧园 3 栋 528 邮箱: lich@sustech.edu.cn 电话: 0755-88018755 Caiheng Li, Professor, Department of Mathematics Room 528, Block 3, Wisdom Garden. email: lich@sustech.edu.cn phone: 0755-88018755
6.	是否面向本科生开放 Open to undergraduates or not	是 Yes
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.) MA214 抽象代数 MA214 Abstract Algebra
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.) 代数图论是一门关于应用代数方法研究图论问题的数学分支。本课程针对基础及应用数学方向学生设置, 教学内容包括群论和图论的相关知识及其联系, 例如置换群, 本原群及拟本原群, 图的对称性, 图的谱理论等。教学目标旨在让学生了解和掌握代数图论的基础理论, 基本方法, 重要例子以及主要结果; 在将来的学习和研究中能够使用代数和组合方法去解决问题。 Algebraic graph theory is a branch of mathematics in which algebraic methods are applied to problems about graphs. This course is for students major in mathematics and applied mathematics. The course includes permutation groups, primitive and quasi-primitive groups, graph symmetry properties, spectral theory of graphs and so on. The goal is to make students to understand fundamental theory, important examples and main results, so they can use algebraic and combinatorial methods in the future study.
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.) 本课程将全部以讲授的方式进行。 This course will be taught in a lecture style.
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	Group actions, permutation groups; 群作用和置换群。(2H)
Section 2	Transitive actions, bi-transitive actions; 传递作用, 二部传递作用。(7H)
Section 3	Imprimitive groups, and quotient actions; 非本原群, 和商作用。(6H)
Section 4	Quasiprimitive groups, and normal quotient actions; 拟本原群, 及正规商作用。(6H)
Section 5	Primitive groups and quasiprimitive groups, O' Nan-Scott theorem; 本原群, 拟本原群, 及 O' Nan-Scott 定理。(6H)
Section 6	Orbital graphs, arc-transitive graphs and digraphs; 轨道图, 弧传递图和有向图。(6H)
Section 7	Graph embeddings and regular maps; 图的嵌入和正则地图。(6H)
Section 8	Spectrum theory of graphs; 图的谱理论。(6H)
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> <p>半期考与期末考以闭卷考的形式进行。总评成绩由以下三部分构成: 平时成绩*30%, 期中成绩*30%, 期末成绩*40%。</p> <p>The mid-term exam and the final exam are conducted in the form of closed-book exam. The final scores consists of three parts: Assignment*30%, Mid-term Exam*30% and Final Exam*40%.</p>
12. 教材及其它参考资料 Textbook and Supplementary Readings	
	<p>Required :</p> <p>Norman Biggs, Algebraic Graph Theory, 2014;</p> <p>Chris Gosil, Gordon Royle, Algebraic Graph Theory, 2000.</p>