课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	MAT8020 抽象代数 II Abstract Algebra II
2.	**课程性质** **Compulsory/Elective**	必修/ Compulsory
3.	**课程学分/学时** **Course Credit/Hours**	3/48
4.	**授课语言** **Teaching Language**	Chinese/English
5.	**授课教师** **Instructor(s)**	高辉 Hui GAO
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 Algebra I (No difference for undergrad students)

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了解和掌握代数学的基本对象包括群，环，模，域的基本思想和基础知识，培养学生在今后的科研中应用基本的代数工具的能力。为进一步学习交换代数或同调代数打下基础。
The aim of this course is to introduce the basic knowledge of groups, rings, modules and fields, and build up the foundation for further study of commutative algebras and homological algebras.

8. 教学目标
Course Objectives

9. 教学方法
Teaching Methods

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掌握代数工具的抽象思维模式；熟悉一些最常见的具体例子（具体的群，环，域，模），并用之思考代数学中的抽象定理；理解不同抽象工具在不同上下文中的使用方法。在后半程，通过对域扩张以及 Galois 理论的学习，理解抽象代数工具对具体问题的应用；产生对当代数学，尤其是代数数论和代数几何的兴趣。

Master the abstract thinking mode of Algebra; getting familiar with some most common concrete examples (concrete groups, rings, fields, modules), and use them to think about abstract theorems; understand roles and applications of different abstract tools in different contexts. In later half of the course, by learning fields extensions and Galois theory, understand how abstract tools can be applied to concrete questions; and build up interests in modern mathematics, particularly in algebraic number theory and algebraic geometry.

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	群论（包括 Jordan-Holder 定理和 Sylow 定理），约 6 小时 Group theory (including Jordan-Holder theorem and Sylow theorem), around 6 hours
	Section 2	环理论（包括环的基本性质，理想；唯一分解环，主理想整环）， 约 10 小时 Rings (including basics of rings, ideals, UFD and PID)， around 10 hours
	Section 3	模理论（包括链条件） 约 16 小时 Modules (including chain conditions), around 16 hours
	Section 4	域理论及伽罗瓦理论（包括有限域和伽罗瓦理论基本定理）约 16 小时 Fields and Galois theory (including finite fields and fundamental theorem of Galois theory), around 16 hours
	Section 5	
	Section 6	
	Section 7	
	Section 8	
	Section 9	
	Section 10	
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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.） Paper Exams. HW: 30%, Midterm: 20%, Final: 50%	
12.	**教材及其它参考资料** **Textbook and Supplementary Readings**	
	1. Algebra (GTM 211)，Serge Lang. 2. Algebra (GTM 73), Thomas W. Hungerford. 3. Advanced Modern Algebra，Rotman	