

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	泛函分析 Functional Analysis				
2.	授课院系 Originating Department	数学系 Department of Mathematics				
3.	课程编号 Course Code	MA302				
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	春季 Spring				
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)	孙景瑞, 数学系, 电子邮箱: sunjr@sustech.edu.cn Jingrui SUN, Department of Mathematics, Email: sunjr@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact					
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	0	0	0	48

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	MA301 实变函数, MA202 复变函数 Theory of Functions of a Real Variable (MA301), Complex Analysis (MA202)
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**

此为本科泛函分析的入门课程，涵盖如线性空间、Banach 空间、Hilbert 空间、对偶空间、Hahn-Banach 定理、一致有界原理、开映射定理及闭图像定理等泛函的基本知识。

This is an entry level course of Functional Analysis for undergraduates, covering basic knowledge about Functional Analysis, such as linear spaces, Banach spaces, Hilbert spaces, dual spaces, Hahn-Banach Theorem, uniformly bounded principle, open mapping theorem, closed graph theorem.

16. **预达学习成果 Learning Outcomes**

学生需要理解泛函中的基本概念和重要定理，并能运用已学知识证明泛函的命题。

Students are expected to understand the basic concepts and important theorems in Functional Analysis and use the learned knowledge to prove propositions related to the subject.

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. 赋范空间（6 学时）
Normed Spaces (6 credit hours)
2. 连续线性映射（8 学时）
Continuous Linear Maps (8 credit hours)
3. Hilbert 空间（14 学时）
Hilbert Spaces (14 credit hours)
4. Banach 空间（12 学时）
Banach Spaces (12 credit hours)
5. 紧算子（8 学时）
Compact Operators (8 credit hours)

18. **教材及其它参考资料 Textbook and Supplementary Readings**

教材 Textbook:

Functional Analysis: An Introduction to Metric Spaces, Hilbert Spaces, and Banach Algebras, by Joseph Muscat, Springer, 2014.

泛函分析讲义（上），张恭庆，林源渠，北京大学出版社，1987。

Functional Analysis, Second Edition, by Walter Rudin, McGraw-Hill, 1991.

其他参考资料 Supplementary Readings:

实变函数论与泛函分析：下册，夏道行，吴卓人等，高等教育出版社，第2版，2010。

A Course in Functional Analysis, by John B. Conway, Springer-Verlag New York Inc.; 2nd ed., 2010.

Functional Analysis, by Peter Lax, 高等教育出版社，2007.

Functional Analysis: Introduction to Further Topics in Analysis, by Elias M. Stein and Rami Shakarchi, Princeton University Press, 2011.

Elements of the Theory of Functions and Functional Analysis, by Kolmogorov and Fomin, Martino Fine Books, 2012.

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		5		
课堂表现 Class Performance		0		
小测验 Quiz		0		
课程项目 Projects		0		
平时作业 Assignments		25		
期中考试 Mid-Term Test		30		
期末考试 Final Exam		40		
期末报告 Final Presentation		0		
其它（可根据需要 改写以上评估方 式） Others (The above may be modified as necessary)		0		

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



南方科技大学
SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

