

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.

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|-----|--|---|------------------------------|-------------------------------|--|---------------------|
| 1. | 课程名称 Course Title | 复变函数(H) Complex Analysis (H) | | | | |
| 2. | 授课院系 Originating Department | 数学系 Mathematics | | | | |
| 3. | 课程编号 Course Code | MA232 | | | | |
| 4. | 课程学分 Credit Value | 3 | | | | |
| 5. | 课程类别 Course Type | 专业核心课 Major Core 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) | 李勤, 数学系, 电子邮箱 liqin@sustc.edu.cn Li Qin, Department of Mathematics | | | | |
| 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 | | | | 48 |

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| 12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements | 数学分析 III (MA203a) 或数学分析精讲 (MA213) Mathematical Analysis III (MA203a) or Real Analysis (MA213) |
| 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**

复变函数论是现代数学的一个重要分支。它在数学的许多分支以及物理、工程技术领域中都有广泛的应用。本课程旨在使学生理解并掌握复变函数的基本理论，了解复变函数的应用，特别是复变函数与现代数学中与众多数学分支如几何学，拓扑学，数论的关系。

The theory of functions of a complex variable is an important branch of modern mathematics. It has wide applications in many braches of mathematics as well as in physics and engineering. This course aims to enable students to understand and grasp the basic theory of functions of a complex variable, learn its applications, especially its relation with modern mathematics including geometry, topology and number theory.

16. 预达学习成果 **Learning Outcomes**

通过本课程的学习，学生应掌握复变函数的基本计算，掌握全纯函数、解析函数、亚纯函数等基本概念，掌握柯西定理、柯西积分公式、留数公式，黎曼映照等重要定理，并能够运用这些定理来解决问题。

After completing this course, students should master the basic calculation of functions of a complex variable. They should master the basic concepts such as holomorphic, analytic, and meromorphic functions. They should also master the important theorems such as Cauchy's Theorem, Cauchy's integral formula, the residue formula, Riemann mapping theorem and be able to solve problems using these theorems.

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. Preliminaries to Complex Analysis 复分析预备知识 (2 学时)
2. Holomorphic functions, Cauchy-Riemann equations 全纯函数, CR 方程 (6 学时)
3. Cauchy's Theorem and Its Applications 柯西定理及其应用 (10 学时)
4. Meromorphic Functions and the Logarithm, residue theorem 亚纯函数与对数, 留数定理, (12 学时)
5. Entire Functions 整函数 (6 学时)
6. Introduction of Zeta function Zeta 函数简介(6 学时)
7. Conformal Mappings and introduction of Riemann surfaces 共形映射与黎曼曲面简介(6 学时)

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

教材 Textbook:

Complex Analysis, by Elias M. Stein and Rami Shakarchi, 影印版, 世界图书出版公司, 2013年1月版

其它参考资料 Supplementary Readings:

Complex Analysis: An Introduction to the Theory of Analytic Functions of One Complex Variable, by Lars V. Ahlfors

Complex Analysis, by Serge Lang

Functions of One Complex Variable, by John B. Conway

Complex Variables and Applications, by James Ward Brown and Ruel V. Churchill

Real and Complex Analysis, by Walter Rudin

简明复分析, 龚昇 编著

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 | | | | |
| 平时作业 Assignments | | 30 | | |
| 期中考试 Mid-Term Test | | 30 | | |
| 期末考试 Final Exam | | 40 | | |
| 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



南方科技大学
SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

