

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	计算数学专题 Topics in Computation Mathematics
2.	授课院系 Originating Department	数学系 Mathematics
3.	课程编号 Course Code	MAT7047
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	英文 English
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)	汤涛教授
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)	50

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	无 NA
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

在短时间内，快速地把学生引导到一个活跃的、有发展前途的研究领域的前沿。

In a short period of time, lead the student to the research front of an active and promising research field.

16. 预达学习成果 Learning Outcomes

介绍科研前沿结果，给学生提出好的科研问题，引导他们到一个活跃的、有发展前途的研究领域。

The course will expose the students to the research front, and provide to them good research problems, leading them to an active and promising research field.

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.)

Topic

I.Introduction and finite difference method(8h)

upwinding scheme

central differencing

4th order compact scheme

II.Conservative methods(8h)

Monotone scheme

TVD scheme

finite volume scheme

III-1.Numerical methods for incompressible flows(8h)

Steady problems

unsteady problems

III-2.Spectral methods(8h)

Fourier and Chebyshev spectral methods

pseudospectral methods

some application of spectral methods

IV.Numerical methods for incompressible flows(8h)

Steady problems

unsteady problems

V. Numerical Methods for phase field models(8h)

Energy stability

Operator splitting

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

Spectral Methods: Algorithms, Analysis and Applications 汤涛,2013.11 Springer

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		30		
小测验 Quiz				
课程项目 Projects		70		
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam				
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)				

University

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

