

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	水力学 Hydraulics				
2.	授课院系 Originating Department	环境科学与工程学院 School of Environmental Science and Engineering				
3.	课程编号 Course Code	ESE216				
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	中文 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)	授课教师 Name: 匡星星 Kuang Xingxing 所属学系 Dep.: 环境科学与工程学院 School of Environmental Science and Engineering 联系方式 Email: kuangxx@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	待公布 To be announced				
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	40	8	0	0	48

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	先修课 Pre-requisites: 高等数学 Calculus, 大学物理/ General Physics
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 N/A
14. 其它要求修读本课程的学系 Cross-listing Dept.	无 N/A

教学大纲及教学日历 SYLLABUS

15. **教学目标**
Course Objectives

《水力学》是研究水的静态平衡和机械运动规律及其在工程中实际应用的学科，是水文与水资源工程本科专业的专业核心课。通过讲课，使学生具备以下能力：

- (1) 掌握水力学相关的基本知识、基本原理、基本研究方法，为解决复杂的相关水力学问题奠定基础；
- (2) 综合运用水力学的理论和知识，解释地表水、地下水分布、运动，采用水力学公式进行定量计算；
- (3) 创造水力学的实验条件，获取流体压强、速度等运动要素，计算流体流量、能量、动量变化，判定流态、水头变化规律，分析水头损失成因；
- (4) 利用中外文献资料，了解本水力学学科发展动态、社会需求与最新应用领域，培养专业兴趣，提高自学能力。

The aim of this course is making students familiar with the static balance, mechanical motion and its practical applications in the engineering of water. Main contents of this course include hydrostatics, hydro kinematics, fundamental of fluid dynamics, laminar flow, turbulent flow and energy loss, seepage flow, dimension analysis, and similarity principles. After this course, students will obtain the following skills:

- (1) Fundamentals of hydraulics and skills to solve complex hydraulic problems
- (2) Use hydraulics to explain flow of surface water and groundwater and calculations
- (3) Skills to build hydraulic experiments and obtain fluid pressure and velocity, calculate flux, energy, momentum, discriminating flow pattern, and analyzing head loss
- (4) Skills to search the literature and learn the trend of hydraulics, social need and the latest applications, develop interests and self-learning

16. **预达学习成果 Learning Outcomes**

学生能够建立数学模型和运用水力学知识分析与解决实际问题

After this course, students can construct mathematical models and use hydraulics to solve practical problems.

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.)

第一讲、绪论(2学时)/Lecture 1: Introduction (2 class hours)

- 第二讲、流体静力学 (Part 1) (2 学时) / Lecture 2: Hydrostatics Part 1 (2 class hours)
- 第三讲、流体静力学 (Part 2) (2 学时) / Lecture 3: Hydrostatics Part 2 (2 class hours)
- 第四讲、流体运动学 (Part 1) (2 学时) / Lecture 4: Hydrokinematics Part 1 (2 class hours)
- 第五讲、流体运动学 (Part 2) (2 学时) / Lecture 5: Hydrokinematics Part 2 (2 class hours)
- 第六讲、流体动力学基础 (Part 1) (2 学时) / Lecture 6: Fundamentals of Fluid Dynamics Part 1 (2 class hours)
- 第七讲、流体动力学基础 (Part 2) (2 学时) / Lecture 7: Fundamentals of Fluid Dynamics Part 2 (2 class hours)
- 第八讲、流体动力学基础 (Part 3) (2 学时) / Lecture 8: Fundamentals of Fluid Dynamics Part 3 (2 class hours)
- 第九讲、流体动力学基础 (Part 4) (2 学时) / Lecture 9: Fundamentals of Fluid Dynamics Part 4 (2 class hours)
- 第十讲、层流、紊流及其能量损失 (Part 1) (2 学时) / Lecture 10: Laminar Flow, Turbulent Flow and Energy Loss Part 1 (2 class hours)
- 第十一讲、层流、紊流及其能量损失 (Part 2) (2 学时) / Lecture 11: Laminar Flow, Turbulent Flow and Energy Loss Part 2 (2 class hours)
- 第十二讲、层流、紊流及其能量损失 (Part 3) (2 学时) / Lecture 12: Laminar Flow, Turbulent Flow and Energy Loss Part 3 (2 class hours)
- 第十三讲、层流、紊流及其能量损失 (Part 4) (2 学时) / Lecture 13: Laminar Flow, Turbulent Flow and Energy Loss Part 4 (2 class hours)
- 第十四讲、孔口、管嘴出流与有压管流 (Part 1) (2 学时) / Lecture 14: Orifice Outflow, Nozzle Discharge and Pressurized Pipe Flow Part 1 (2 class hours)
- 第十五讲、孔口、管嘴出流与有压管流 (Part 2) (2 学时) / Lecture 15: Orifice Outflow, Nozzle Discharge and Pressurized Pipe Flow Part 2 (2 class hours)
- 第十六讲、明渠流动 (2 学时) / Lecture 16: Open Channel Flow (2 class hours)
- 第十七讲、堰流 (2 学时) / Lecture 17: Weir Flow (2 class hours)
- 第十八讲、渗流 (Part 1) (2 学时) / Lecture 18: Seepage Flow Part 1 (2 class hours)
- 第十九讲、渗流 (Part 2) (2 学时) / Lecture 19: Seepage Flow Part 2 (2 class hours)
- 第二十讲、量纲分析和相似原理 (2 学时) / Lecture 20: Dimensional Analysis and Similarity Principles (2 class hours)

另有 8 学时用于习题/辅导/讨论, 总计 48 学时。

The remaining 8 class hours are used for tutorials and the total number of class hours is 48.

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

教材/Textbook:

《流体力学》（第二版），李玉柱、苑明顺，高等教育出版社，2008

Yuzhu Li, and Mingshun Yuan, *Hydraulics (second edition)*, Beijing: Higher Education Press, 2008.

教参/References for Further Reading:

(1)《水力学》（第三版），吴持恭，高等教育出版社，2003

(2)《工程流体力学（水力学）》，闻德荪，高等教育出版社，2003

(3)《水力学》，李炜，武汉水力水电大学出版社，2000

(4)《流体力学》（第二版），张也影，高等教育出版社，1999

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		10%		
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		20%		
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

