

海洋工程概论（OCE107）课程大纲目录

1.2022 春季学期.....	2
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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	海洋工程概论 Introduction to Ocean Engineering
2.	授课院系 Originating Department	海洋科学与工程系 Department of Ocean Science and Engineering
3.	课程编号 Course Code	OCE107
4.	课程学分 Credit Value	3
5.	课程类别 Course Type	专业基础课 Major Foundational 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)	宋光铃海洋科学与工程系 工学院南楼 304, 0755-88011416 Prof. Guang-Ling Song, Department of Ocean Sciences and Engineering College of Engineering, South Tower 304, 0755-88011416
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	助教: 待定 TA:
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	

11. 授课方式 Delivery Method	讲授	习题/辅导/讨论	实验/实习	其它(请具体注明)	总学时
	Lectures	Tutorials	Lab/Practical	Other (Please specify)	Total
学时数 Credit Hours	44		4		48
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	n/a				
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

通过本课程的教学，使学生对海洋工程学科有一个基本了解，并激发学生对海洋工程的兴趣和热情，为今后的专业乃至职业选择提供参考依据。

By taking this course, students will develop a basic understanding to ocean engineering. This course may also stimulate students' interest and enthusiasm in Ocean Engineering, encourage them to think about the possibilities and perspectives of professional work in relevant areas, help them to decide whether to pursue a postgraduate degree in Ocean Engineering and a future career in relevant areas.

16. 预达学习成果 Learning Outcomes

通过本课程的学习，学生将初步了解海洋工程的范畴，初步认识海洋动力环境，修得海洋工程结构、材料和基础的入门知识，了解海洋资源开采、海洋能开发、海洋空间利用等领域的主要问题。

By taking this course, students will gain a preliminary understanding of the scope of ocean engineering. They will understand the ocean dynamics and its impact on ocean engineering, acquire knowledge about ocean engineering structures, materials and foundations, and get a better understanding to the major developments in the fields of marine resource exploration, marine energy exploitation, and marine space utilization.

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.)

Section 1 绪论（2 学时）

海洋工程发展史，我国海洋工程发展现状及展望

Introduction of the course (2 hours)

History of ocean engineering, the current status and perspectives of Ocean Engineering in China.

Section 2 海洋环境 I —— 海面环境 (8 学时)

水波的理论基础, 海洋波动, 潮汐和潮流, 近岸流

Ocean engineering environment - Ocean surface (8 hours)

Fundamentals of water waves, wind waves, tides and tidal currents, nearshore currents

Section 3 海洋环境 II —— 海床环境 (8 学时)

海底地貌, 近岸泥沙运动, 岸滩演变, 淤泥质海岸的动力响应

Ocean engineering environment - Seabed (8 hours)

Morphology of seabed, nearshore sediment movement, beach evolution, dynamic response of muddy coast

Section 4 海洋工程结构 (4 学时)

海洋工程结构的类型, 海洋工程结构的动力分析方法, 海洋工程结构的优化方法

Ocean engineering structures (4 hours)

Types of ocean engineering structures, dynamics of ocean engineering structures, optimized design

Section 5 海洋工程材料 (4 学时)

金属材料, 混凝土

Ocean engineering materials (4 hours)

Steel, concrete

Section 6 海洋工程基础 (4 学时)

海洋工程基础的类型, 海洋土的性质与承载力, 浅基础, 桩基, 基础处理

Ocean engineering foundations (4 hours)

Types of ocean engineering foundations, bearing capacity of seabed, shallow foundations, pile foundations, foundation treatment

Section 7 海洋资源开采工程 (4 学时)

海上石油开采, 海底矿产资源开采

Ocean resource exploitation (4 hours)

Offshore oil exploration, seabed mineral resources exploitation

Section 8 海洋能源利用工程 (4 学时)

海上风能, 波浪能, 潮汐能和潮流能

<p>Marine energy utilization (4 hours)</p> <p>Offshore wind energy, wave energy, tidal energy</p> <p>Section 9 海洋空间利用工程 (4 学时)</p> <p>人工岛, 大型浮体</p> <p>Ocean space utilization project (4 hours)</p> <p>Artificial islands, large floating structures</p> <p>Section 10 海洋工程的环境影响评价 (2 学时)</p> <p>海洋工程引发的环境问题, 解决问题的方法</p> <p>Environmental impact of ocean engineering (2 hours)</p> <p>Problems and solutions</p> <p>认识实习 (4 学时)</p> <p>海洋工程认识实习</p> <p>Field trips to ocean engineering projects</p>

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

<p>教材:</p> <p>Elements of Ocean Engineering</p> <p>Author(s): Randall, Robert E.</p> <p>Publisher: Society of Naval Architects and Marine Engineers</p> <p>Year: 2010</p> <p>ISBN: 978-1-61344-658-4, 978-0-939773-77-0 参考资料:</p> <p>课堂上分发。</p>

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		10		
小测验				

Quiz				
课程项目 Projects		20		
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam		60		
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

海洋科学与工程系本科教学委员会
 Department of Ocean Science and Engineering Undergraduate Committee

课程详述

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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)	宋光铃海洋科学与工程系 工学院南楼 304, 0755-88011416 Prof. Guang-Ling Song, Department of Ocean Sciences and Engineering College of Engineering, South Tower 304, 0755-88011416
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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	n/a				
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

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By taking this course, students will have a basic understanding of ocean engineering. This course may also stimulate students' interest and enthusiasm in Ocean Engineering, encourage them to think about the possibilities and perspectives to work in relevant areas, and even help them decide whether to pursue a postgraduate degree in Ocean Engineering and a future career in the areas.

16. 预达学习成果 Learning Outcomes

通过本课程的学习，学生将初步领略海洋环境和行为，了解海洋工程结构与功能等入门知识，想象海洋资源、能源、空间利用的未来。

By taking this course, students will gain a preliminary understanding of ocean environment and behaviour, acquire basic knowledge about ocean engineering structures and foundations, and have a prospective of marine resource exploration, marine energy exploitation, and marine space utilization.

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 1 部分 绪论 (2 学时)

课程简介

Section 1 Introduction of the course (2 hours)

Introduction of the course.

第2部分 海洋环境 (4学时)

海底地貌,海风,水波理论基础,海洋波动,潮汐和潮流

Section 2 Ocean engineering environment (4 hours)

Fundamentals of Morphology of seabed, wind, water waves, wind waves, tides and tidal currents, nearshore currents

第3部分 海上灾难与探测技术 (4学时)

飓风、海啸、火山、滑坡等

Section 3 Offshore geological hazards and measurements (4 hours)

Hurricane, tsunami, volcano, landslide, etc.

第4部分 海上工程基本过程 (2学时)

海上油气分布、勘探、开采、生产等

Section 4, Basic offshore engineering (2 hours)

Offshore oil/gas distribution, exploration, production, etc.

第5部分 海洋工程结构 (4学时)

海洋工程平台的类型和优缺点, 应用、设计和安装

Section 5 Ocean engineering structures (4 hours)

Types of ocean engineering structures and their advantages/disadvantages, as well as their applications, design and installation

第6部分 海洋工程基础 (2学时)

海洋工程基础的类型, 海洋土的性质与承载力, 基础处理

Section 6 Ocean engineering foundations (2 hours)

Types of ocean engineering foundations, bearing capacity of seabed, foundation treatment

第 7 部分 海上锚泊系统 (2 学时)

锚泊种类, 锚, 锚泊系统

Section 7 Mooring system on ocean (2 hours)

Mooring methods, anchors equipment, mooring systems

第 8 部分 超大型海上结构 (4 学时)

大型结构及其科学问题

Section 8 Very large floating structures (4 hours)

Very large structures and the scientific issues

第 9 部分 海洋能源利用工程 (4 学时)

海上风能、波浪能、潮汐能、潮流能、其他可利用能源

Section 9 Marine energy (4 hours)

Offshore wind energy, wave energy, tidal energy, and others

第 10 部分 海洋新资源存储、勘采、利用 (4 学时)

海底矿物、CO₂ 等

Section 10 Marine resources (4 hours)

Seabed minerals, etc.

第 11 部分 海洋工程材料 (4 学时)

金属材料, 混凝土, 涂层、新兴功能材料

Section 11 Ocean engineering materials (4 hours)

Steel, concrete, coating, corrosion and protection, functional materials

第 12 部分 海洋腐蚀与防护 (4 学时)

材料腐蚀、防护策略与手段

Section 12 Ocean engineering materials (4 hours)

corrosion of marine engineering materials, protection strategy and approaches

第 13 部分 课堂讨论 (4 学时)

Section 13 Discussion (4 hours)

第 14 部分 报告+演讲 (4 学时)

Section 14 Report + presentation (4 hours)

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

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Author(s): Randall, Robert E.

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Year: 2010

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出勤 Attendance		10		
课堂表现 Class Performance		10		
小测验 Quiz				
课程项目 Projects		30		课堂讨论
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam				
期末报告		50		报告+演讲

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**

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 B. 二级记分制（通过/不通过） **Pass/Fail Grading**

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