

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	海洋工程前沿 Frontiers of 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	OCE206
4.	课程学分 Credit Value	3
5.	课程类别 Course Type	专业选修课 Major Elective Course
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)	陈建飞 海洋科学与工程系 创园 9 栋 207, 0755-88015269 Prof. Jian Fei CHEN, Department of Ocean Sciences and Engineering Chuang Yuan 9-207, 0755-88015269
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	助教: 陈登硕, 海洋科学与工程, 18503049929 TA: Dengshuo Chen, Department of Ocean Sciences and Engineering, 18503049929
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	30

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
	48				48
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements					
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。

Through the attending this course, students will develop 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 of professional work in relevant areas, helping them to decide whether to pursue a 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勘察的目的、方法及任务，对海洋水文地理环境有一概貌性的认识，了解海洋工程领域常用的工程材料，并较系统地掌握海洋石油平台的总体性能、结构形式以及相应的设计和建造方法。此外，学生将对海洋工程领域的特种工程船，油气管道及超大型海上浮式结构物的发展现状有基本的了解。最后，针对蓬勃兴起的海洋能利用，海洋矿物资源开发，海上渔业资源开发背景，使学生了解多种海洋能发电技术的原理和装置，大洋锰结核及海洋渔业资源的开发前景和可能的开采或利用方式等内容。

By taking this course, students will achieve an understanding of the purpose, methods and tasks of ocean engineering survey; marine hydrological and geographical environment, common engineering materials used in ocean engineering; performance, structural forms and corresponding design and construction methods of offshore oil platforms; special engineering ships; oil and gas transportation pipelines; and very large offshore floating structures. In response to the booming development of ocean energy, exploitation of marine mineral resources and cultivation of marine fishery resources, students will learn the principles and devices of various ocean energy generation technologies; the mining of mineral resources such as oceanic manganese nodule and cultivation of marine fishery resources.

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 课程绪论 (2 学时)

海洋资源开发, 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)

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

Section 2 海洋工程勘察 (2 学时)

海洋勘察的目的、方法及任务, 海洋工程测绘, 海洋工程物探, 海洋工程钻探, 海洋原位测试, 海洋灾害地质调查

Ocean engineering survey (2 hours)

Objectives, methods and tasks of ocean surveying; mapping, geophysical exploration, drilling and in situ testing in ocean engineering, geological survey of marine disasters

Section 3 海洋工程环境 (4 学时)

海洋工程环境的研究内容及方法, 海洋气象条件概述, 海洋水文条件概述, 海洋地质灾害及其工程危害性

Ocean engineering environment (4 hours)

Research content and methods of ocean engineering environment, overview of ocean meteorological conditions, overview of ocean hydrological conditions, ocean geological hazards and their engineering implications

Section 4 海洋工程材料 (6 学时)

海洋工程用钢, 水泥和混凝土, 纤维加强树脂复合材料(FRP), 腐蚀与防腐蚀

Ocean engineering materials (6 hours)

Ocean engineering materials such as steel, cement and concrete, fibre reinforced polymer (FRP) composites, corrosion and corrosion protection

Section 5 海洋岩土工程 (4 学时)

海洋土区域特征, 海洋浅基础, 海洋桩基础, 系泊基础

Marine geotechnical engineering (4 hours)

Characteristics of regional marine soil, shallow marine foundations, marine pile foundations, mooring foundations

Section 6 海洋平台介绍 (6 学时)

海洋石油钻探与生产装置概述, 海洋平台设计与建造,

Introduction of offshore platforms (6 hours)

Overview of offshore oil drilling and production equipment, offshore platform design and construction

Section 7 海洋工程特种工程船介绍 (2 学时)

Introduction to special engineering ship in ocean engineering (2 hours)

Section 8 海洋油气管道介绍 (2 学时)

Introduction of marine oil and gas transportation pipelines (2 hours)

Section 9 超大型海上浮式结构物 (4 学时)

Very large floating structures (4 hours)

Section 10 海洋能发电技术 (4 学时)

海上风电技术, 波浪能发电技术, 潮汐能发电技术, 潮流能和海流能发电技术, 温差能利用

Ocean energy generation technologies (4 hours)

Offshore wind power generation technology, wave energy generation technology, tidal power generation technology, tidal current energy and ocean current energy generation technology, temperature difference energy utilization

Section 11 海洋矿物资源开发 (2 学时)

大洋矿物(以锰结核为例)的分布与开发前景, 勘探方式, 开采方式

Exploration and exploitation of oceanic manganese nodule (2 hours)

Distribution and development prospect, exploration and exploitation

Section 12 海上渔业资源开发 (2 学时)

Cultivation of marine fishery resources (2 hours)

Section 13 课程展示与讨论 (8 学时)

学生将自主选择题目, 进行研究、展示与课堂讨论。

In-class presentation and debate: (8 hours)

Students will conduct research on a topic of their choice, produce a written report, and present their findings in the class.

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

教材:

1. 龚晓南. 《海洋土木工程概论》, 中国建筑工业出版社.

参考资料:

1. Karimirad, Madjid. Offshore energy structures: for wind power, wave energy and hybrid marine platforms. Springer, 2014.
2. Matori, Abd Nasir B., et al., eds. Structural, Environmental, Coastal and Offshore Engineering. Trans Tech Publications Ltd, 2014.
3. 孙丽萍, 聂武. 《海洋工程概论》, 哈尔滨工程大学出版社.
4. 李治彬. 《海洋工程结构》, 哈尔滨工程大学出版社.

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		60		
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam				
期末报告		30		

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

