浙江大学研究生课程教学大纲

课程编号	3413194	**开课院系**	海洋学院		
中文课程名称	海洋平台与石油钻采技术			**授课语言**	全外文
英文课程名称	Ocean Platforms and Drilling Technology				
课程性质	专业选修课	**课程类别**	博士生课	**课程体系**	通用课程
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学历		**E-mail**		**联系电话**	
教学学时	32	**实验学时**	0	**实践学时**	0
其他学时	0	**总学时**	32	**自学学时**	0
学分数	1.5	**考核方式**	课程考查	**开课学期**	夏
课程内容中文简介	该课程采用全英文授课，核心内容是教导学生掌握海洋平台的设计计算方法。包括： 1. 介绍石油钻井技术的发展史和石油地球化学及石油地质学在石油开采过程中的应用； 2. 介绍了不同类型的石油平台及其使用环境，如张力腿平台(TLP)、浮式生产油轮轮（FPSO）、半潜式平台(Semisubmersibles)、深海回接式平台(Subsea tieback)； 3. 详细介绍了石油平台的主要组成部分，如钻架、提升装置、钻头、钻柱内外的泥流动循环及液压； 4. 介绍了钻直井和定向钻井两种不同的钻井方法及其使用条件； 5. 重点介绍了钻柱的设计及其受力计算方法，如所受的动态压力(dynamic pressure forces)、加速力(acceleration forces)和波浪力(wave velocity forces)。				
课程内容英文简介	The module will teach the following: 1.Overview of basic ocean platform design concepts 2.Environmental design considerations 3.Wave, wind and current induced motions and loads 4.Second-order wave induced forces and response of floating and compliant Ocean platforms 5.Soil-structure interaction and ocean platform foundation design 6.The history of oil well drilling: Analysis of the role of hydrocarbons in the energy economy and a historical overview of the drilling process. 7.Petroleum geochemistry and geology: Description of petroleum systems and trapping mechanisms and an introduction to petroleum surveys; wire line logs and seismic surveys 8.The oil well: An introduction to the different types of rig design, a description of the oil well including details of the hoisting tackle, drilling bits, the role of drilling mud and an overview of how to drill a well 9.Drill string design: Principles of drill string design 10.Casing design: Types of casing and principles of casing design; casing point selection and an introduction to the concept of fracture gradient 11.Drilling hydraulics: Principles of fluid flow in pipes, annular flow and flow through nozzles. 12.Drilling and completion: Principles of different drilling types (straight and directional) and well completion processes.				
预备知识要求	船舶与海洋工程专业的基础知识				
	The aims of this module are: □To introduce different types of ocean platform designs and their design concepts for oil				

教学目标	and gas exploration and production; □To provide knowledge in order to understand the factors influencing the dynamic behaviour floating ocean platforms due to environmental forces; □To develop skills in order to predict the dynamic motion response of floating ocean platforms; □To introduce the basic engineering principles of drilling for hydrocarbons in on- and off-shore locations and to provide knowledge of drilling systems; To develop skills in fluid flow, drill string design and casing design for drilling systems;
参考文献	1.Faltinsen, O.M., “Ship Loads on Ships and Offshore Structures”, Cambridge University Press,1990. 2.Hooft, J.P., “Advanced Dynamics of Offshore Structures”, John Wiley & Sons 1973. 3.Sarpkaya, T. and Isaacson,M.” Mechanics of Wave Forces on Offshore Structures”, Van Nostrand Reinhold, New York, 1981 4.McCormick, M.E., “Ocean Engineering Wave Mechanics”, John Wiley & Sons, N.Y., 1973 5.Rabia, H. ‘Oilwell Drilling Engineering - Principles and Practise’, Graham and Trotman Publishing Ltd., 1985 6.Inglis, T.A. ‘Directional Drilling’, Graham and Trotman Publishing Limited, 1987 Davenport, B. ‘Handbook of Drilling Practices’, Gulf Publishing, 1984

参考书目	书名	著者	出版社	出版年份

教学日历	周次	教学内容（包括课堂讲授、实验、讨论、考试等）
	1	Overview of basic ocean platform design concepts ; Environmental design considerations
	2	Wave, wind and current induced motions and loads ; Second-order wave induced forces and response of floating and compliant Ocean platforms
	3	Soil-structure interaction and ocean platform foundation design ; The history of oil well drilling: Analysis of the role of hydrocarbons in the energy economy and a historical overview of the drilling process.
	4	Petroleum geochemistry and geology: Description of petroleum systems and trapping mechanisms and an introduction to petroleum surveys; wire line logs and seismic surveys ; The oil well: An introduction to the different types of rig design, a description of the oil well including details of the hoisting tackle, drilling bits, the role of drilling mud and an overview of how to drill a well
	5	Drill string design: Principles of drill string design
	6	Casing design: Types of casing and principles of casing design; casing point selection and an introduction to the concept of fracture gradient
	7	Drilling hydraulics: Principles of fluid flow in pipes, annular flow and flow through nozzles.

	8	Drilling and completion: Principles of different drilling types (straight and directional) and well completion processes.
申请理由	2017级培养方案修订	

涉及培养方案调整情况 （在所涉培养类型下打“√”）	学科/专业学位类别（领域）名称及代码	年级	硕士	博士	直博生

学科/专业学位类别（领域）意见	负责人签名: 年 月 日
院系意见	主管院长（系主任）签名（盖院系章）: 年 月 日