海洋科学（0707）
Marine Science

学科门类：理学（07）　一级学科：海洋科学（0707）

Discipline Category: Engineering (07)

First-Class Discipline: Marine Science (0707)

一、学科简介

河海大学海洋科学学科源于 1957 年的海洋工程水文专业，经过 60 余年的发展，现拥有海洋科学一级学科学士、硕士和博士学位授权点以及博士后流动站，获江苏省高校优势学科建设工程项目和省重点专业建设点。本学科拥有“海岸灾害及防护教育部重点实验室”、“自然资源部海洋灾害预报技术重点实验室”(共建)、教育部国家外国专家局“海岸带滩涂资源开发与安全学科创新引智基地”等。共有专任教师 80 人，其中教授 15 人，副教授 27 人。本学科涵盖物理海洋学、海洋地质和海洋生物学等，设有海洋多尺度动力过程、极地海洋与气象、深远海工程环境、海洋观测模拟与资料同化、海洋生态环境与资源利用、海洋地质与地球物理等研究方向。近年来承担包括国家自然科学基金重点项目、国家重点研发计划课题和中国海洋石油公司等企业委托项目等 160 余项，总经费近亿元，发表专业研究论文 400 余篇，出版数部专著或教材等。毕业生既能在涉海企事业单位或政府部门从事科研、教学、管理或业务化服务工作，也能在水利和交通、地质和油气资源勘探以及生物、化学和海洋药物等行业或领域发展。

I. Discipline Overview

The discipline of marine science of Hohai University can be traced back to the major of marine engineering hydrology, which was established in 1957. After more than 60 years of development, it has formed a complete talent training system for undergraduate, master, doctor, and postdoctoral studies in marine science with the features of combining science and engineering. This discipline was awarded the key discipline of

Jiangsu province, listed as an "advantageous discipline innovation platform" by the ministry of education. Several advanced research platforms, including the Key Laboratory of Coastal Disaster and Protection (Hohai University) of the Ministry of Education, Key Laboratory of Marine Hazards Forecasting of Ministry of Natural Resources, and Overseas Expertise Introduction Center for Discipline Innovation on Coastal Resources Development and Security, jointly support the development of this discipline. The main scope of marine science involves physical oceanography, marine chemistry, marine biology and ecosystem, marine geology, and marine technology. The college is renowned for its outstanding and experienced staff. Currently, there are 80 full-time faculty members, including 15 professors and 27 associate professors. The discipline covers topics of marine multiscale dynamic processes, polar oceans and meteorology, ocean observations and simulations and data assimilation, marine biotechnology and bio-resource utilization, marine geology, marine geophysics, etc. In recent years, members have chaired over 160 research and application projects with funding of nearly 100 million yuan. Over 400 research papers were published in academic journals, and several monographs and textbooks were composed. Graduate students can be engaged in the researching, teaching, managing, or operational jobs in the enterprise and public institution involving oceanic affairs or in the industrial companies of water resources, transportation, oil and gas exploration, biology, chemistry, and marine medicine.

二、培养目标

1. 河海大学博士层次外国留学生应当在海洋科学领域中具有宽阔的国际视野，能够在世界范围内创新运用和发展海洋科学的理论、技能和方法，在国际事务中具有竞争优势。

2. 以英语为专业教学语言的学科中，外国留学生毕业时，博士研究生的中文能力应当至少达到《国际汉语能力标准》三级水平。

3. 追求真理，具备献身科学事业的敬业精神和科学道德；系统掌握海洋科学的基本理论，具有宽广和坚实的知识基础和基本技能，了解本学科的发展历史、现状和最新动态；具有良好的国际视野和

学术交流能力，能独立从事科学研究工作并做出创新性成果；可以熟练应用英语进行学术交流，了解中国文化并初步具备汉语日常交流能力。

II. Training Objectives

1. International PhD graduates of Hohai University are expected to have broad international view in the relevant academic fields; to creatively apply and develop the theories, skills, and methodologies of the relevant disciplines in the world, and to obtain competitive advantage in the international academic affairs.

2. International PhD graduates must meet the requirement of Level 3 in Chinese Language Proficiency Scales upon graduation if they conduct their coursework in English.

3. Having the willing to pursuit truth and be dedicated to the scientific cause with professionalism and science ethics; Possessing a systematic mastery of the fundamental theories on marine science, broad and solid foundations of knowledge and basic skills, in-depth understanding of the history, current status and latest advancement of the discipline; Having broad international view and academic communication skills, and the ability to independently conduct scientific research and complete innovative achievement; Being proficient in academic English communications, and appreciating Chinese culture, with preliminary ability of speaking Chinese in daily communication.

三、主要研究方向

1. 物理海洋学
2. 海洋生物学
3. 海洋地质
4. 海洋物理学

III. Research Directions

1. Physical Oceanography
2. Marine Biology

3. Marine Geology

4. Marine Physics

四、学制和学习年限

学术学位全英文博士留学研究生的标准学制为 4 年。实行弹性学制，学习年限最短不少于 3 年，最长不超过 6 年。

IV. Number of Years Requirement

The PhD program typically requires 4 years to complete. However, the completing time may vary to 3 years as the minimum and 6 years as the maximum.

五、学分要求和课程设置

1. 学术学位全英文博士留学研究生课程总学分为 15 学分，其中学位课程为 10 学分，非学位课程为 5 学分。另设教学环节。所有课程学习一般应在入学后 1 年内完成。

2. 汉语课每学分为 24 学时，中国概况课每学分为 18 学时，其他课程每学分为 16 学时。

3. 中国国情教育（水韵课堂）为系列专题讲座，要求学生按照要求完成规定的学习任务。

4. 对于汉语水平已达到毕业要求的学生，可申请免修汉语，具体要求详见留学生课程免修有关规定。

具体课程设置如下：

V. Credit Requirements and Curriculum

1. International academic PhD students will complete 15 credits, 10 of which are from degree courses, and 5 of which are from non-degree courses. Students will also complete academic activities. Coursework will be completed in one year after registration.

2. Each credit of Chinese language course is 24 credit hours. Each credit of Introduction to China is 18 credit hours. For other courses, each credit is 16 credit hours.

3. “Water Harmony Lectures” is a series of seminars, which require students to complete the specified

learning tasks.

4. For students who have met the Chinese language requirement for the PhD degree, Chinese language courses can be exempted, of which the details can be referred to in relevant regulations.

The specific curriculum is as follows:

海洋科学全英文学术型留学博士研究生课程设置

Curriculum for English Taught International Academic PhD Students in Marine Science

课程类别 Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	学时 Hours	开课学期 Term	备注 Remarks
学位课程 Degree Course 10 学分	公共课程 General Course	2022LD000001	汉语 I Chinese Language I	2	48	秋 Autumn	必修 Compulsory
		2022LD000003	中国概况 Introduction to China	2	36	秋 Autumn	
		2022LD110001	论文写作指导 Guide of Thesis Writing	2	32	秋、春 Autumn/ Spring	
	基础课程 Basic Course	2022LD130101	地球流体动力学 II Geophysical Fluid Dynamics II	4	64	秋、春 Autumn/ Spring	选修 2 学分 Optional 2 credits at least
		2022LD130102	海洋地质过程 Marine Geological Dynamics	3	48	春 Spring	
		2022LD130103	现代物理海洋学 Modern Physical Oceanography	2	32	秋 Autumn	
		2022LD130104	海洋生物技术前沿 Frontier in Marine Biotechnology	2	32	春 Spring	
		2022LD990301	高等海岸动力学 Advanced Coastal dynamics	2	32	春 Spring	
		2022LD990501	水污染控制工程 Water Pollution Control	2	32	秋 Autumn	
		2022LD991001	应用地球物理 Applied Geophysics	2	32	春 Spring	
	专业课程 Major Course	2022LD130105	学科前沿专题讲座 Special Topics	1	16	秋 Autumn	必修 Compulsory
		2022LD130106	海气相互作用 Air-sea Interactions	2	32	春 Spring	选修 2 学分 Optional 2 credits at least
		2022LD130107	古海洋学 Paleoceanography	3	48	秋、春 Autumn/ Spring	
		2022LD130108	近代光电探测理论 Modern Photoelectric Detection Theory	2	32	春 Spring	
非学位课程 Non-degree Course 5 学分		2022LD110002	中国国情教育（水韵课堂） Water Harmony Lectures	1	16	秋、春 Autumn/ Spring	必修 Compulsory
		2022LD000002	汉语 II Chinese Language II	2	48	春 Spring	
		2022LD130109	气候变化 Climate Change	2	32	春 Spring	选修 2 学分 Optional 2 credits at least
		2022LD130110	现代物理测试原理 Measurement Principles of Modern Physics	2	32	春 Spring	
		选修博士课程 Optional courses for PhD					
教学环节 Academic Activity		学术活动（含博导讲座） Seminar and Conferences (including seminars by PhD advisors)				必修 Compulsory	
		实践活动 Practice Activity					
		科学研究 Scientific Research					

六、教学环节

1. 个人培养计划

学术学位博士研究生入学后，应在导师指导下，在规定时间内按照培养方案和学位论文工作有关规定，结合研究方向和本人实际情况制定个人培养计划，其中学习计划在入学 2 个月内提交。

2. 学术活动

学术学位博士研究生学术活动包括参加国内外学术会议、专家学术讲座、博士生导师讲座，以及研究生学术研讨活动等。申请学位论文答辩前必须参加 20 次以上的学术交流活动，其中博士生导师讲座至少 8 次，由本人做的公开的学术报告 1 次（开题报告、中期检查、预答辩、答辩不计入）。本人做的学术报告由指导教师负责对其学术报告效果进行考核。研究生参加学术活动必须填写相关学术活动登记本。

3. 实践活动

为培养劳动实践能力和责任意识，学术学位博士研究生必须参加实践活动，实践活动形式包括助教、助管、助研、生产实践、社会实践等。由导师对学生实践环节的时长和效果进行考核和评价。

4. 科学研究

学术学位博士研究生应积极参加科学研究课题，并应具有在导师指导下独立负责某专题或子课题的研究工作经历。课题完成后由导师提出综合评审意见。

VI. Academic Activities

1. Study Proposal

The PhD students must prepare a study proposal on how they will complete the PhD degree by considering their research interests, advice from their research advisors, and other requirements mentioned in this document. The proposal must be submitted in two months after official registration.

2. Seminars and Presentations

PhD students must participate in academic conferences, seminars by experts and PhD advisors, and discussion panels. Before their dissertation defense, PhD students must participate in seminars and

conferences over 20 times, including at least 8 seminars by PhD advisors, and deliver at least 1 academic presentation (the activities concerning with their dissertation are not counted). The presentations delivered by the PhD students will be evaluated by their own research advisors. All the seminars and presentations should be recorded in relevant record book.

3. Practice Activities

PhD students are required to participate in practice activities to prepare professional development. Practice activities include teaching assistantship, research assistantship, management assistantship, and industry engagement etc., which are to be assessed by the advisors.

4. Scientific Research

International academic PhD students should vigorously participate in scientific research projects, and shall be capable of conducting independent research on a particular topic or sub-topic under the guidance of their advisors. Their performance will be evaluated by their research advisors.

七、论文工作

学术学位博士学位论文研究工作必须经过文献阅读、论文选题、论文计划及开题报告、论文中期检查、科研成果产出、学位论文预审、学位论文评阅、学位论文答辩等环节。具体按照《河海大学博士学位论文工作管理办法》和学院相关文件执行。留学博士研究生可使用英文撰写论文。

VII. Dissertation

The dissertations of academic PhD students are required to complete the stages of literature review, topic selection, dissertation plan and dissertation proposal, mid-term examination, output of scientific research achievements, pre-examination, review and assessment, and dissertation defense. Detailed requirements can be referred to in “Hohai University PhD. Dissertation Management Measures” and relevant documents in College of Oceanography. Dissertations in English is acceptable.

八、本学科推荐阅读的重要书目、专著和学术期刊

VIII. Recommended Bibliographies, Monographs, and Academic Journals of the Discipline

1. Robert H. Stewart. Introduction to Physical Oceanography [M]. Texas A&M University, 2008

2. Steven J. Fletcher. From Theory to Application. Data Assimilation for the Geosciences [M]. Elsevier, 2017.

3. Mamaev, 0. I. Temperature -Salinity Analysis of World Ocean Waters[M]. Elsevier Scientific Publishing, 374 pp, 1975.

4. Kampf,J. Ocean Modelling for Beginners [M]. Springer Berlin

Hei delberg.2009.

5. Provenzale, A., E. Palazzi, and K. Fraedrich, eds. The Fluid Dynamics of Cl imate [M]. Springer, 209 pp, 2016.

6. Pasquero, C, A. Provenzale, E. Palazzi, and K. Fraedrich, Eds. The Fluid Dynamics of Climate[M]. CISM International Centre for Mechanical Sciences. Springer, 39 - 60, 2016.

7. Siedler, G., S. M. Griffies, and J. Church,eds.A 21st Century Perspective. Second edit ion[M]. Ocean Circulation and Climate. Elsevier, 868 pp, 2013.

8. Lau,W. K. -M. , and D. E. Waliser. Intraseasonal Variability in the Atmosphere-Ocean Climate System [M]. Springer Berlin Heidelberg, 2012.

9. Webster, P. J. Dynamics of the Tropical Atmosphere and Oceans [M]. Wiley, 2020.

10. Kri shnamurti, T. N., L. Stefanova, and V. Misra. Tropical

Meteorology [M]. Springer New York, 2013.

11. Khouider, B. Waves, Clouds, and Precipitation [M]. Models for Tropical Climate Dynamics. Springer International Publishing, 2019.

12. Ambaum,M. H. P. Thermal Physics of the Atmosphere. 1st ed[M]. Wiley, 2010.

13. G. T. Csanady. Air- Sea Interaction - Laws and Mechanisms [M]. Cambridge University Press, 2004.

14. Flato, G. Evaluation of Climate Models [M]. Climate Change 2013.

15. Marshall, J. and R. A. Plumb. Atmosphere, ocean, and climate dynamics [M], 2008.

16. Gill,A. E. Atmosphere-ocean dynamics [M]. Nachdr. Acad. Press, 2003.

17. Cavallini, F. and F. Crisciani. Quasi-geostrophic theory of oceans and atmosphere: topics in the dynamics and thermodynamics of the fluid earth[M]. Springer, 2013.

18. Vallis, G. K. Atmospheric and Oceanic Fluid Dynamics: Fundamentals and Large-scale Circulation[M]. Cambridge University Press, 2011.

19. 期刊(journal): Quaternary Science Reviews

20. 期刊(journal): Cell

21. 期刊(journal): PNAS

22. 期刊(journal): Current Biology

23. 期刊(journal): Plos Biology

24. 期刊(journal): eLife

25. 期刊(journal): Marine Biology

26. 期刊(journal): Marine Biotechnology

27. 期刊(journal): ISME Journal

28. 期刊(journal): Limnology and Oceanography

29. 期刊(journal): Marine Biotechnology

30. 期刊(journal): Acta Oceanologica Sinica

31. 期刊(journal): Journal of Geophysical Research: Oceans

32. 期刊(journal): Deep Sea Research I

33. 期刊(journal): Climate Dynamics

34. 期刊(journal): Journal of Climate

35. 期刊(journal): Journal of Oceanography

36. 期刊(journal): Geophysical Research Letters

37. 期刊(journal): Journal of Physical Oceanography

38. 期刊(journal): Journal of Atmospheric and Oceanic Technology

39. 期刊(journal): Advances in Atmospheric Sciences

40. 期刊(journal): Journal of the Atmospheric Sciences