

# (0707) 海洋科学 2023 级全日制直博生培养方案

2023 Full-time Doctoral after Bachelor's Program for Marine Science

## 一、基本信息 Basic Information

<b>院系名称</b> School	海洋学院 School of Oceanography		<b>适用年级</b> Grade	2023 级 2023 Class	
<b>适用专业</b> Major	海洋科学 Marine Science		<b>标准学制</b> Duration	5 年 5 Years	
<b>学习形式</b> Study Mode	全日制 Full time				
<b>项目类型</b> Program Type	学术型 Academic				
<b>培养层次</b> Program Level	直博生 Doctoral after Bachelor's				
<b>最低学分</b> Min Credit	40	<b>最低 GPA 学分</b> Min GPA Credit	18	<b>最低 GPA</b> Min GPA	2.7

## 二、学科简介 Introduction

海洋科学是研究海洋的现象、性质与变化规律，及海洋资源保护、开发与研究所需要的知识体系。上海交通大学发展海洋科学与技术服务于国家“关心海洋、认识海洋、经略海洋”的海洋强国战略，促进海洋科技、海洋经济与人文海洋的发展。

海洋科学学科具有多学科交叉的特点，有别于现有理学、工学和生命学科。其研究生培养的专业选择、课程计划和培养计划与上海交大现有院系既有显著区别，又有互补性，优化了上海交大学科的布局。上海交通大学海洋科学学科在海洋研究院主持下，在船建学院、生命学院、环境学院、海洋工程国家重点实验室及微生物代谢国家重点实验室的支持下，八年来发展迅速，2018 年国家自然资源部第二海洋研究所与上海交通大学共建海洋学院，2021 年与中国极地研究中心共建极地生态保护研究所，充实了大量海洋科学技术人才，形成了海洋科学与工程和技术相结合的特色教研团队。海洋学院现有专职教研人员 118 名，其中中科院院士 3 人，工

程院院士 3 人，美国科学院院士 3 人，国家自然科学基金杰出青年基金获得者 5 人。

2018 年 3 月设立了海洋科学一级学科硕士学位授权点。2019 年 3 月设立了海洋科学一级学科博士学位授权点。目前海洋学院设有物理海洋学、海洋化学、生物海洋学与海洋生物学（含海洋战略）、海洋地质学、海洋技术（含海洋遥感）5 个二级学科。

Marine Science is a knowledge system that involves the phenomena, nature and change rules of the ocean, as well as the protection, exploitation and research of marine resources. Shanghai Jiao Tong University (SJTU) develops marine science and technology to serve the national strategy of “caring for the ocean, understanding the ocean, and managing the ocean”, and to promote the development of marine science and technology, marine economy and marine humanities.

Marine Science is characterized by interdisciplinary, which is quite different from other existing disciplines such as science, engineering and life. The major selection, curriculum design and training plan for postgraduate students of Marine Science are not only significantly different from but also complementary to the existing disciplines of SJTU, optimizing the discipline layout of SJTU. Under the auspices of Institute of Oceanography, and the support of School of Naval Architecture, Ocean & Civil Engineering, the School of Life Sciences and Biology, the School of Environment, and the State Key Laboratory of Ocean Engineering and the State Key Laboratory of Microbial Metabolism, the Marine Science discipline has developed rapidly in the past eight years. In 2018, The Second Institute of Oceanography of the Ministry of Natural Resources and Shanghai Jiao Tong University jointly established the School of Oceanography (SOO), enriching a large number of scientists that majored in marine science and technology, and forming a special teaching and research team combining marine science with engineering and technology. Currently, SOO has 118 full-time faculty members, including 3 academicians of the Chinese Academy of Sciences, 3 academicians of the Chinese Academy of Engineering, 3 academicians of the US Academy of Sciences, and 5 winners of Excellent-Youth-Fund from the National Natural Science Foundation of China.

In March, 2018, the master's degree in first-level discipline of Marine Science was established. In March, 2019, the doctoral degree in the first-level discipline of Marine Science was established. Currently, SOO has five secondary disciplines including physical oceanography, chemical oceanography, biological oceanography (including marine strategy), marine geology, and marine technology (including ocean remote sensing).

### **三、培养目标 Program Objective**

培养具有系统掌握海洋科学坚实宽广基础理论知识，深入了解学科进展、动态及最新发展前沿，具有较强的科学技术研究能力，并在学科领域取得理论或应用创新成果，具有熟练阅读本领域外文资料的能力、较好的写作能力和国际学术交流的能力，能胜任高等院校或科研院所

教学、科研或科技管理等工作的海洋科学与技术交叉复合型高级专门人才。

The Doctoral after Bachelor's Program aims to equip candidates with systematic, solid, and broad fundamental theoretical knowledge in oceanography, to introduce them the in-depth knowledge of developments, dynamics, and frontiers of academic research, to develop and use advanced research ability of science and technology to obtain innovative theoretical and/or applied achievements in academic fields. The candidates are also expected to be able to proficiently use a second language to read, write and communicate in their research field. We hope to cultivate interdisciplinary senior researchers in marine science and technology that are qualified for faculty, staff and administrator positions in universities and institutions.

#### 四、培养方式及学习年限 Training Mode and Study Duration

本项目采用全日制学习、导师制培养模式；直博生的基本学习年限为 5 年，最长学习年限（含休学）不超过 7 年。

This program adopts the full-time learning and instructor-responsible mode; Basically, 5 years are required for regular academic doctor program. The maximum length of non-oriented regular doctor program (including suspension) can not exceed 7 years.

#### 五、课程学习要求 Course Requirement

须修读完成不少于 40 学分，其中 GPA 学分不少于 18，GPA 不低于 2.7。各类课程具体要求如下：

课程类别 Course Type	学分要求 Min Credits	门数要求 Min Courses	GPA 学分要求 Min GPA Credit	备注 Note
公共基础课 General Courses	6	4	3	
专业基础课 Program Core Courses	9	4	9	
专业前沿课 Program Frontier Courses	5	3	6	
专业选修课 Program Elective Courses	0	0	0	

专业基础课程中的“物理海洋学”、“化学海洋学”、“生物海洋学”、“海洋地质学”、“海洋技术前沿”属于必须具备的学科基础且为博士资格考试考察知识范围，必须修读，如在本科期间已修读，可申请免修，否则须放入个人培养计划修读。

进实验室的学生必须修《实验室安全教育》课程，但不计入学位学分和总学分。

The students entering the laboratory must take the course "Laboratory safety Education", but it is not included in the degree credits and total credits.

## 六、培养过程要求 Training Requirement

直博生 Doctoral after Bachelor's	
资格综合考试 Qualification Exam	第四学期（未通过者第五学期可重考，仍未通过者“转为硕士生培养”或“应予退学”） 4th semester (if fail to pass, another exam will be available at 5th semester. If still fails, student will be transferred into master program, or drop out)
开题报告 Thesis Proposal	第六学期 6th semester
年度考核 Annual Assessment	第八学期 8th semester
预答辩 Pre-defense	第十学期 10th semester
答辩 Defense of the Thesis	第十学期 10th semester

## 七、学术成果要求 Requirement on Academic Achievements

研究生应达到学校和学院规定的学术论文发表要求，答辩前应在检索期刊上以第一作者发

表（或录用）学术文章，文章内容必须为学位论文的内容。博士研究生应在学院认定的 B 类（或以上）期刊发表原创性论文，论文数量和类别需满足如下之一：（1）一篇 A 类期刊（2）两篇 B 类期刊。具体博士学位要求参阅文件《海洋学院博士学位（学术型）授予标准》。申请学位所需要的最低要求论文均需以上海交通大学海洋学院为第一发表单位，学生为第一作者。具体标注如下：

中文标注：上海交通大学海洋学院，上海 200030。

英文标注：School of Oceanography, Shanghai Jiao Tong University, 1954 Huashan Rd., Shanghai 200030, China. 地址可以根据需要选择是否使用，单位名称如需简称，可使用 Sch. Oceanog., Shanghai Jiao Tong Univ.。

The graduate students should meet the requirements of publishing academic papers set by Shanghai Jiao Tong University and the School of Oceanography. They are required to publish academic papers as first-author in peer-reviewed journals before the thesis defense. The paper content must be consistent with that of the dissertation. For the doctoral degree, please check the document "Standards for Awarding Doctoral Degree (Academic) of School of Oceanography" for detailed requirements. It is required to list Shanghai Jiao Tong University School of Oceanography as the first publishing unit and the applicant as the first author.

Chinese: 上海交通大学海洋学院，上海 200030。

English: School of Oceanography, Shanghai Jiao Tong University, 1954 Huashan Rd., Shanghai 200030, China. Or Sch. Oceanog., Shanghai Jiao Tong Univ.。

## 八、学位论文 Thesis/Dissertation Work

学位论文工作环节应包括开题报告、学位论文中期检查、论文评审与答辩。论文一般应以中文书写并按学校规定的格式打印（参阅《上海交通大学博士、硕士学位论文撰写要求》）。如有特殊情况（例如论文被指定参加国际专家评审，或该研究生不具有中文写作能力）需要用英文写作，则需要向院学位委员会申请并获批准，上报研究生院备案。满足学术论文发表要求，

完成学位论文后，还需检测重复率、论文评审等环节均通过，方能申请答辩。

The dissertation should include thesis proposal, mid-term examination of the dissertation, review and defense of the thesis. Generally, the thesis should be written in Chinese and printed in the format required by the SJTU (see "Shanghai Jiao Tong University Thesis Writing Requirements for Graduate Students"). In case of special circumstances (such as the thesis is designated to participate in international expert review, or the graduate student does not have Chinese writing ability) when English writing is needed, the graduate student needs to obtain approval from the Academic Degrees Committee and report to the graduate school for filings. When the academic paper publication requirements are met and the thesis is completed, it is also necessary to pass the repetition rate test and finish the review of the thesis before the graduate student is able to apply for a defense.

## 九、课程设置 Courses

详见下页 Please refer to the next page.

撰稿人签字： 日期：

校稿人签字： 日期：

审核人签字： 日期：

主管院长签字： 院系公章 日期：

说明：

1. 培养方案制定完成并经院系学位委员会审核通过后，全日制请将本表格电子版(word)发送至 SherryLi327@sjtu.edu.cn, 非全日制请将本表格电子版(word)发送至 jshen@sjtu.edu.cn;
2. 请在新研究生教育管理信息系统完成新培养方案的申请，并在审核通过后将本表格的纸质版（签字盖章）送交研究生院存档。

课程类别 Category	课程代码 Course Code	课程名称 Course Name		学分 Credit	授课语言 Language*	开课学期 Semester	可以计算 GPA	必须计算 GPA	备注 Note
		中文 Chinese	English 英文						
公共基础课 General Courses	FL6001	学术英语	English for Academic Purposes	2	英文 in English	秋季 Fall	是 Yes	是 Yes	必修 Compulsory
	GE6001	学术写作、规范与伦理	Scientific Writing, Integrity and Ethics	1	中文 in Chinese	秋季 Fall	否 No	否 No	必修 Compulsory
	MARX6003	自然辩证法概论	Introduction to Dialectics of Nature	1	中文 in Chinese	春季 Spring	是 Yes	是 Yes	必修 Compulsory
	MARX7001	中国马克思主义与当代	Marxism in China	2	中文 in Chinese	春季 Spring	是 Yes	否 No	必修 Compulsory
专业基础课 Program Core Courses	MS6401H	物理海洋学	Physical Oceanography	2	中文 in Chinese	秋季 Fall	是 Yes	是 Yes	选修 Elective
	MS6501	化学海洋学	Chemical Oceanography	2	中文 in Chinese	秋季 Fall	是 Yes	是 Yes	选修 Elective
	MS6601	生物海洋学	Biological Oceanography	2	英文 in English	秋季 Fall	是 Yes	是 Yes	选修 Elective
	MS6701	海洋地质学	Marine Geoscience	2	中文 in Chinese	秋季 Fall	是 Yes	是 Yes	选修 Elective
	MS6801	海洋技术前沿	State of the Art for Marine Technology	2	中文 in Chinese	秋季 Fall	是 Yes	是 Yes	选修 Elective
	MS6301	海上实践	Sea Practice	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	STAT6002	生物数学 (I)	Biology Mathematics I	3	中文 in Chinese	春秋 Spring & Fall	是 Yes	是 Yes	四选一, 至少选修3学分数学类课程。 Must take one of them.
	MATH6009	数学物理方程	Mathematical-Physical Equation	3	中文 in Chinese	春秋 Spring & Fall	是 Yes	是 Yes	

	STAT6001	基础数理统计	Fundamental Mathematical Statistics	3	中文 in Chinese	春秋季 Spring& Fall	是 Yes	是 Yes	
	MATH6004	计算方法	Numerical Analysis	3	中文 in Chinese	春秋季 Spring& Fall	是 Yes	是 Yes	
专业前沿课 Program Frontier Courses	GE6011	学术报告会	Academic Lectures	1	英文 in English	春秋季 Spring& Fall	否 No	否 No	必修 Compulsory
	MS8401	海洋环境数据分析	Marine Environmental Data Analysis	2	英文 in English	春季 Spring	是 Yes	否 No	选修 Elective
	MS8402	地球流体动力学 I	Geophysical Fluid Dynamics	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8405	计算流体力学	Computational Fluid Dynamics	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS9401	海洋湍流	Ocean Turbulence	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS9402	地球流体动力学 II	Geophysical Fluid Dynamics II	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8501	海洋生物地球化学动力学	Ocean Biogeochemical Dynamics	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8502	海洋生物地球化学过程和气候变化	Marine Biogeochemical Cycles and Climate Change	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8503	同位素地球化学	Isotope Geochemistry	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8505	海洋有机地球化学	Marine Organic Geochemistry	2	中文 in Chinese	秋季 Fall	是 Yes	否 No	选修 Elective
	MS8601	海洋生态学	Marine Ecology	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
MS8602	浮游生物动力学	Plankton Dynamics	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective	



					Chinese	Spring			
	MS8701	海洋地球物理	Marine Geophysics	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8702	海底科学	Submarine Geosciences	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8703	海底矿产资源与成矿系统	Seafloor Mineral Resources and Ore-forming System	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8704	海洋卫星遥感原理与应用技术	Ocean Satellite Remote Sensing Principle and Application	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8801	潜水器设计原理	Design Principle of Underwater Vehicles	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
	MS8802	海洋观测、探测与作业技术	Marine Observation, Exploration and Operation Technologies	2	中文 in Chinese	春季 Spring	是 Yes	否 No	选修 Elective
专业选修课 Program Elective Courses	MS8403	海气相互作用理论	Theory on Ocean-Atmosphere Interaction	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
	MS9403	物理海洋建模理论与数值方法	Modeling Theories and Numerical Methods in Physical Oceanography	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
	MS8406	海洋科学与技术前沿系列VI-海洋的物理生地化过程耦合	Frontiers in Marine Science and Technology VI-Physical Biogeochemical Process Coupling	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
	MS8407	海洋科学与技术前沿系列VII-厄尔尼诺-南方涛动现象的动力学机制	Frontiers in Marine Science and Technology VII-Dynamic of El Nino-Southern Oscillation	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
	MS8506	海洋科学与技术前沿系列IV-海洋环境化学	Frontiers in Marine Science and Technology IV-Marine Environmental Chemistry	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
	MS8604	海洋科学与技术前沿系列V-海洋微生物生态学	Frontiers in Marine Science and Technology V-Marine Microbial Ecology	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
	MS8705	海洋科学与技术前沿系列 I-海洋生态遥感	Frontiers in Marine Science and Technology I-Remote sensing of marine ecology	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
	MS8706	海洋科学与技术前沿系列III-海岸带遥感（图像处理与分析）	Frontiers in Marine Science and Technology III-Remote Sensing of Coastal Zone	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective

MS9301	海洋科学与技术前沿系列VIII-学术论文写作	Frontiers in Marine Science and Technology VIII-Science Writing Tutorial	1	英文 in English	春季 Spring	否 No	否 No	选修 Elective
MS8408	海洋科学与技术前沿系列 IX-近海动力学	Frontiers in Marine Science and Technology IX-Coastal Dynamics	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
MS8507	海洋科学与技术前沿系列 X-地球化学模拟	Frontiers in Marine Science and Technology X-Geochemical modeling	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
MS8508	海洋科学与技术前沿系列 XI-海洋痕量金属示踪	Frontiers in Marine Science and Technology XI-Metal tracers in the sea	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
MS8605	海洋科学与技术前沿系列 XII-深海海洋生物多样性	Frontiers in Marine Science and Technology XII-Biodiversity in the deep sea	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
MS8707	海洋科学与技术前沿系列 XIII-近海水文地质学	Frontiers in Marine Science and Technology XIII-Coastal hydrogeology	2	英文 in English	秋季 Fall	否 No	否 No	选修 Elective
MS8803	海洋科学与技术前沿系列 XV-非线性动力学	Frontiers in Marine Science and Technology XV-Nonlinear Dynamics	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
MS8409	海洋科学与技术前沿系列 XVI-海洋观测和动力学分析基础	Frontiers in Marine Science and Technology XVI-Observation-based analysis of ocean dynamics	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
MS8410	海洋科学与技术前沿系列 XVII-机器学习在海洋学中的应用	Frontiers in Marine Science and Technology XVII-Machine Learning in Oceanography	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
MS8411	海洋科学与技术前沿系列 XVIII-海洋模拟与模型参数化	Frontiers in Marine Science and Technology XVIII-Ocean modeling parameterization and coupling	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
MS8412	海洋科学与技术前沿系列 XIX-大洋环流基础	Frontiers in Marine Science and Technology XIX-Fundamentals of Ocean Circulation	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
MS8413	海洋科学与技术前沿系列 XX-海洋混合	Frontiers in Marine Science and Technology XX-Ocean Mixing	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
MS8606	海洋科学与技术前沿系列 XXI-微生物海洋学原理与技术	Frontiers in Marine Science and Technology XXI-Principles and Techniques in Microbial Oceanography	2	英文 in English	春季 Spring	否 No	否 No	选修 Elective
MS8607	海洋科学与技术前沿系列 XXII-海洋藻类固碳与碳汇	Frontiers in Marine Science and Technology XXII-Carbon fixation and sequestration by marine algae	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective

	MS8608	海洋科学与技术前沿系列 XXIII-海洋底栖生态学	Frontiers in Marine Science and Technology XXIII-Marine benthic ecology	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
	MS8709	海洋科学与技术前沿系列 XXIV-沉积学原理与应用	Frontiers in Marine Science and Technology XXIV-Sedimentology: Fundamental and Application	2	中文 in Chinese	春季 Spring	否 No	否 No	选修 Elective
	MS8804	海洋科学与技术前沿系列 XXVI-极地遥感	Frontiers in Marine Science and Technology XXVI-Polar Remote Sensing	2	中文 in Chinese	秋季 Fall	否 No	否 No	选修 Elective
任意选修课	GE6003	实验室安全教育	Laboratory Safety Education	0.5	中文 in Chinese	秋季 Fall	否 No	否 No	<b>必修 Compulsory</b>