

水力学及河流动力学 (081502)

Hydraulics and River Dynamics

学科门类：工学 (08) 一级学科：水利工程 (0815)

Discipline: Engineering (08)

First-Class Discipline: Water Conservancy (0815)

一、学科简介

本学科隶属于国家“双一流”建设学科水利工程学科，是河海大学传统优势学科之一，在国内外颇具影响，为国家水利建设作出巨大贡献。1981年成为首批具有博士、硕士学位授予权的学科，1994年批准为江苏省首批重点学科；1999年被评为省级优秀学科梯队，连续被列为国家“九五”、“十五”、“211工程”重点建设学科，2007年批准为国家重点学科。现有专任导师40人，其中，教授16人，博士生导师13人，国家级人才人选7人。研究领域包括河流管理与生态环境、工程水力学理论与应用、水沙运动理论与工程应用、工程渗流及地下水环境、计算水力学及水利信息技术等方面，在平原河网水动力学、水工水力学、工程渗流及地下水环境等方面形成了明显优势和学科特色。近年来，学科主持或承担了多项国家级重点课题和基金项目，获国家科技进步奖2项、全国创新争先奖1项、省部级科技奖11项，获江苏省优秀博硕士论文11篇。学科具有显著的传统理论与现代科学技术相结合、地表水与地下水相结合、一般水力学问题与生态环境水力学问题相结合等特点和优势，具有良好发展前景。

毕业生主要就业单位有科研院所、高等学校、政府机关、流域管理机构、勘测规划设计部门等。

I. Discipline Overview

The discipline is one of the traditional advantageous disciplines of Hohai University, affiliated to the national "double First-class" construction discipline of hydraulic engineering discipline. It has great international influence and has made great contributions to national water conservancy construction. In 1981,

it became one of the first disciplines authorized to confer doctor's and master's degrees. In 1999, it was rated as the provincial Excellent Discipline team, and successively listed as the key construction discipline of the national “9th Five-Year Plan” “10th Five-Year Plan” and “211 project”. In 2007, it was approved as the national key discipline. Now there are 40 full-time faculty members, including 16 professors, 13 doctoral supervisors and 7 national talent candidates. Research areas include River Management Aquatic Ecology and Environment, Theory and Applications of Engineering Hydraulics, Flow Sediment Transportation Theory and Its Applications in River Engineering, Engineering Seepage and Groundwater Environment, Computational Hydraulics and Hydroinformatics, etc., forming the obvious advantages and disciplinary characteristics in the Plain River Network Hydrodynamics, Engineering Hydraulics, Engineering Seepage and Groundwater Environment, etc. In recent years, the discipline has led or undertaken a number of national key projects and grant projects, won twice National Science and Technology Progress Award, once National Innovation Prize, 11 times provincial and ministerial science and technology awards, and 11 times excellent doctoral and master's theses in Jiangsu Province. The discipline has obvious characteristics and advantages in combination, such as traditional theory with modern scientific technology, surface water with groundwater, general hydraulics with ecological environment hydraulics, and has a good prospect for development.

The main employment units of the graduates are research institutions, colleges and universities, government departments, watershed management companies as well as surveying, planning and design consultancies, etc.

二、培养目标

1. 河海大学硕士层次外国留学生应当在水力学及河流动力学领域中具有较好的国际视野，能够在多个国家的实际环境中运用和发展水力学及河流动力学的知识、技能和方法，并具备参与国际事务和国际竞争的能力。

2. 以英语为专业教学语言的学科、专业中，外国留学生毕业时，硕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. 本学科旨在培养水力学及河流动力学领域的高级专门人才。掌握水力学及河流动力学领域坚实的基础理论及系统的专门知识；了解本学科的现状和发展动态，具有从事科学研究或独立从事工程规划、勘测、设计、施工、维护或管理等专门技术工作的技能和能力；具有较强的计算机应用能力、能熟练阅读本专业外文资料和一定的外文写作能力及进行国际学术交流的能力。

II. Training Objectives

1. International master graduates of Hohai University are expected to have good international view, to apply and develop the theories, skills, and methodologies in the actual environment of several countries, and to participate in the international academic affairs.

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

3. The purpose of this discipline is to train senior professionals in the field of Hydraulics and River Dynamics. Master solid and broad basic theories and systematic expertise in the field of Hydraulics and River Dynamics. Familiar with the current situation and development trend of the discipline as well as the latest progress of the research direction, have the ability to independently and creatively engage in scientific research of the discipline and effectively solve practical engineering problems, be qualified for engaging in scientific research, plan, survey, design, construction management or other engineering and technical work of water conservancy projects. Proficient in using computer and modern information technology, have good writing ability and international academic communication ability, with a broad international vision.

三、主要研究方向

1. 工程水力学理论与应用
2. 水沙运动理论与工程应用
3. 河流管理与生态环境

4. 工程渗流及地下水环境
5. 计算水力学及水信息技术

III. Research Directions

1. Theory and Applications of Engineering Hydraulics
2. Flow Sediment Transportation Theory and Its Applications in River Engineering
3. River Management Aquatic Ecology and Environment
4. Engineering Seepage and Groundwater Environment
5. Computational Hydraulics and Hydroinformatics

四、学制和学习年限

学术学位全英文硕士留学研究生的标准学制为 3 年。实行弹性学制，学习年限最短不少于 2 年，最长不超过 5 年。

IV. Number of Years Requirement

The master program typically requires 3 years to complete. However, the completing time may vary to 2 years as the minimum, and 5 years as the maximum.

五、学分要求和课程设置

1. 学术学位全英文硕士留学研究生课程总学分为 28 学分，其中学位课程为 20 学分，非学位课程为 8 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 Provision

1. International academic master students will complete 28 credits generally, 20 of which are from degree courses, and 8 of which are from non-degree courses. Students will also complete academic activities. Coursework will be completed in one year after registration.

2. The credit for a degree course is usually 2 to 3, while that for a non-degree one is 1 to 2. It is noted that credit hours vary with courses. For example, each credit of Chinese language course and Introduction to China requires 24 and 18 credit hours respectively. For the other courses, each credit requires 16 credit hours.

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

4. For students who meet the Chinese language requirement for the master degree, Chinese language courses can be exempted, of which the details can be referred to in relevant documents.

The specific curriculum provision is as follows:

水力学及河流动力学全英文学术型留学硕士研究生课程设置

Curriculum for English Taught International Academic Master Students Majoring in Hydraulics and River Dynamics

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 20 学分	公共课程 General Course 8 学分	2022LM000001	汉语 I Chinese Language I	2	48	秋 Autumn	必修 Compulsory
		2022LM000002	汉语 II Chinese Language II	2	48	春 Spring	
		2022LM000003	中国概况 Introduction to China	2	36	秋 Autumn	
		2022LM110001	论文写作指导 Guide of Thesis Writing	2	32	秋、春 Autumn /Spring	
	基础课程 Basic Course 8 学分	2022LM880001	矩阵论 Matrix Theory	2	32	春 Spring	选修 6 学分 Optional 6 credits at least
		2022LM880002	最优化方法 Optimization Methods	2	32	秋 Autumn	
		2022LM880003	数值分析 Numerical Analysis	3	48	秋 Autumn	
		2022LM880004	数学物理方程 Partial Differential Equations	2	32	春 Spring	
		2022LM990201	多目标决策理论及方法 Theory and Method of Multi-Objective Decision-making	2	32	春 Spring	必修 Compulsory
	专业课程 Major Course 4 学分	2022LM020101	工程紊流的数值模拟方法 Numerical Simulation Methods for Engineering Turbulence	2	32	秋 Autumn	选修 4 学分 Optional 4 credits at least
		2022LM020103	河流动力学 River Mechanics	2	32	春 Spring	
		2022LM020104	工程水动力学及应用 Engineering Hydrodynamics and Applications	2	32	春 Spring	
	非学位课程 Non-degree Course 8 学分	2022LM110002	中国国情教育（水韵课堂） Water Harmony Lectures	1	16	秋、春 Autumn /Spring	必修 Compulsory
2022LM330001		程序设计方法 Methods of Programming	2	32	秋 Autumn	选修 7 学分 Optional 7 credits at least	
2022LM020102		多孔介质中的水流与溶质运移 Flow and Transport in Porous Media	2	32	春 Spring		
2022LM770001		流体力学 Fluid Mechanics	2	32	秋 Autumn		
2022LM990101		环境水力学 Environmental Hydraulics	1	16	春 Spring		
选修硕士课程 Optional courses for master						选修 Optional	
教学环节 Academic Activity	学术活动（含博导讲座） Seminar and Conferences					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

学术学位硕士研究生入学后，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

学术学位硕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，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 10 次以上的学术交流活动，其中博导讲座至少 2 次。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，学术学位硕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。

VI. Academic Session

1. Study Proposal

The master students must prepare a proposal on how they will complete the master 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 Conferences

Master students must participate in academic conferences, talks by experts, seminars by PhD advisors, and discussion panels. Before they apply for the master degree, master students must participate in seminars and conferences over 10 times, including 2 seminars by PhD advisors. All the seminars and talks should be recorded in relevant record book.

3. Practical Activities

Master 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., that are to be assessed by the advisors.

七、论文工作

学术学位硕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《河海大学硕士学位论文工作管理办法》和水利水电学院相关文件执行。留学硕士研究生可使用英文撰写论文。

VII. Dissertation

The dissertations of academic master 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 Master's Dissertation Management Measures” and relevant documents in College of Water Conservancy and Hydropower Engineering. Dissertation 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

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