水利水电工程（081504）
Water Conservancy and Hydropower Engineering

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

河海大学水利水电工程学科于 1984 年获硕士学位授予权，1993 年取得博士学位授予权，1996 年被评为水利部重点学科，2007 年成为国家重点学科，是水利工程一流学科建设的支撑学科。现有博士生导师 19 名，硕士生导师 20 余名，形成了以中青年教授为学术带头人，双聘院士为科学研究顾问，骨干教师为主体的导师队伍。学科以水利水电系统和大型水电站、泵站、抽水蓄能电站、长距离供水系统、潮汐电站及风力发电等为主要研究对象，着重研究和解决工程规划、设计、运行、调控等理论方法与关键技术，服务于“南水北调”、“西电东送”等工程建设和国家重大战略需求。学科全面参与了三峡工程、南水北调、溪洛渡、白鹤滩等国家重大水利水电工程和我国几乎所有大型抽水蓄能电站的研究，为我国水利水电和新能源建设做出重要贡献。学科主持或参与完成 20 余项基金项目和国家重大科技项目，在理论研究和工程应用等方面取得了多项创新性成果，部分创新研究成果已达国际领先水平，获国家科技进步奖 4 项、省部级科技进步奖 20 余项、国家教学科研成果奖 2 项。毕业生主要在设计院、科研院校、水电开发公司及各级管理部门就业。

I. Discipline Overview

The discipline of Water Conservancy and Hydropower Engineering at Hohai University was granted the right to award Master degree in 1984, and the right to award Ph.D Degree in 1993. The discipline was rated as the key discipline of the Ministry of Water Resources of the People’s Republic of China in 1996, and granted as the National Level Key Discipline in 2007. It is the key supporting for the World First Class University and

First Class Academic Discipline Construction of hydraulic engineering. The discipline has 19 supervisors for Ph. D. students and more than 20 supervisors for Master Degree students at present, forming a team with young and middle-aged professors as academic leaders, double-appointed academicians as scientific research consultants, and backbone teachers as the main body. All the researches in this discipline mainly focus on large hydropower stations, pumping stations, pumped-storage power stations, tide hydropower stations and wind power, etc., with the aim to investigate and solve the key technology problems in these hydraulic projects including energy planning, design theories, operation control, etc., serving the South-to-North Water Diversion Project, the West-to-East Power Transmission Project and other key projects and major national strategic needs. The discipline has participated in the research of the Three Gorges Project, the South-to-North Water Diversion Project, Xiluodu Project, Baihetan Project and other major national water conservancy and hydropower projects and almost all large-scale pumped storage power stations in China, making important contributions to the construction of water conservancy, hydropower and new energy in China and the world. The discipline has presided over or participated in more than 20 major national science and technology projects, and has gained many innovative research achievements in basic theories and engineering application. Some innovative researches have reached the international leading level, and won 4 National Science and Technology Progress Awards, more than 20 Ministerial and Provincial-Level Science and Technology Progress Awards, and 2 National Teaching Achievement Awards. Graduates are mainly employed in design institutes, scientific research institutions, hydropower development companies and administrative departments.

二、培养目标

1. 河海大学硕士层次外国留学生应当在水利水电工程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利水电工程学科的知识、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. 本学科硕士留学研究生旨在培养本学科领域的高级专门人才。掌握本学科领域坚实的基础理论和系统专门知识，具有从事科学研究工作或独立担负专门技术工作的能力；具有较强的计算机应用能力、本专业外文资料熟练阅读能力及一定的国际学术交流能力；了解中国文化并具备汉语日常交流能力。

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. This discipline aims to cultivate high-level specialized talents in the field of Water Conservancy and Hydropower Engineering with the consolidation of basic theories, systematic professional knowledge, necessary engineering practice, and scientific research and technological work ability, who can independently engage in scientific research and make creative achievements. They have strong computer application ability, certain foreign literature reading ability and international academic communication ability. Understanding Chinese culture and preliminary ability of daily communication in Chinese.

三、主要研究方向

1. 水利水电系统规划与工程经济
2. 水电站和泵站水力学与结构
3. 水力机组过渡过程控制与仿真
4. 抽水蓄能及新能源技术
5. 水利水电工程生态调控与管理

III. Research Directions

1. Water Resources and Hydropower System Planning and Engineering Economy

2. Hydraulics and Structures of Hydropower Station and Pump Station

3. Hydraulic Transient Control and Simulation of Hydraulic Unit

4. Technique of Pumped-Storage Project and Renewable Energy

5. Ecological Regulation and Management of Hydropower Projects

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。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 master students will complete 28 credits, 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. 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 master degree, Chinese language courses can be exempted, of which the details can be referred to in relevant regulations.

The specific curriculum provision is as follows:

水利水电工程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 Water Conservancy and Hydropower Engineering

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	2022LM020301	水电站与泵站水力学 Hydraulics of Hydropower and Pumping System	2	32	春 Spring	必修 Compulsory
		2022LM020302	瞬变流（一） Fluid Transients I	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
		2022LM020303	风力和潮汐发电技术 Wind Power and Tidal Power	2	32	秋 Autumn	
		2022LM991501	工程经济学 Engineering Economy	2	32	春 Spring	
		2022LM770001	流体力学 Fluid Mechanics	2	32	秋 Autumn	
		2022LM770002	塑性力学 Engineering Plasticity	2	32	春 Spring	
		2022LM770003	弹性力学 Elastic Mechanics	2	32	秋 Autumn	
		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 Activities

1. Study Proposal

The master students must prepare a study 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 Presentations

Master students must participate in academic conferences, seminars by experts and PhD advisors, and discussion panels. Before their dissertation defense, master students must participate in seminars and conferences over 10 times, including at least 2 seminars by PhD advisors. All the seminars and presentations should be recorded in relevant record book.

3. Practice 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., which 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

1. 《中国水力发电工程》编审委员会. 中国水力发电工程[M].北京:中国电力出版社,2000.

2. 王浩,蒋云钟,雷晓辉等. 水质水量联合调控与应急处置关键技术研究[M].北京:中国水利水电出版社,2018.

3. 王浩,雷晓辉,蒋云钟等. 梯级水库群面向生态的多目标综合调度关键技术[M].北京:中国水利水电出版社,2016.

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9. 方国华. 水资源规划及利用（第三版）（原水利水能规划）[M].北京:中国水利水电出版社,2015.

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16. 章光新,张蕾. 湿地生态水文与水资源管理[M].北京:科学出版社,2014.

17. 赵人俊. 流域水文模型—新安江模型与陕北模型[M].北京:中国水利电力出版社,1983.

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