

水利水电工程（081504）

学科门类：工学（08）一级学科：水利工程（0815）

一、专业描述

河海大学水利水电工程学科创建于 1952 年，1984 年取得硕士学位授予权，1993 年取得博士学位授予权，1996 年被评为水利部重点学科，2007 年成为国家二级重点学科，也是国家“211 工程”重点建设学科和江苏省优势学科建设工程的重点学科，水文水资源与水利工程科学国家重点实验室和水资源高效利用与工程安全国家工程研究中心是该学科研究主要的支撑平台。学科现有 10 余名博士生导师，近 20 名硕士生导师，另有近 10 名校外兼职博导。

本学科以我国大型水电站、泵站、抽水蓄能电站和潮汐电站，以及风力发电等新能源为主要研究对象，着重研究和解决水利水电工程以及新能源的规划、设计理论及关键技术，注重源头创新和均衡发展，为我国的水利水电和新能源建设做出了重要贡献。本学科积极推进优势学科创新平台建设，承担了多项“973”项目、“863”项目、国家自然科学基金项目等部省级重大科技项目，以及各类科研项目，在理论研究和工程应用等方面取得了多项创新性研究成果。

二、培养目标

水利水电工程博士生培养目标为，致力于培养本学科领域的高层次人才。毕业生在本门学科上掌握坚实宽广的基础理论和系统深入的专门知识；具有独立从事科学研究工作的能力，能熟练运用现代基础理论和先进的计算方法及实验技术手段开展科学研究，在科学或专门

技术上做出创新性的成果；熟练阅读本专业外文文献，具有较强的英文写作和国际学术交流能力。能够胜任大型复杂工程关键技术的研究开发，高等院校和研究机构的教学科研工作。

三、研究方向

1. 水利水电系统规划与发展战略 (Water Resources and Hydropower System Planning and Development Strategy)
2. 水电站和泵站水力学/结构 (Hydraulics/Structure of Hydropower Plant and Pump Station)
3. 水力机组安全控制及过渡过程 (Hydraulic Transient and Safety Control of Hydraulic Unit)
4. 抽水蓄能及新能源技术 (Technique of Pumped-Storage Project and Renewable Energy)

四、申请条件

1. 已在我国认可的海内外高校或学术机构获得硕士学位者。
2. 能够用英语进行课程学习、阅读文献和进行学术写作，能够用英语进行日常交流。

五、培养年限

攻读博士学位的标准学制为 4 年，实行弹性学制，学习年限最短不低于 3 年，最长不超过 6 年。

六、学分要求和课程设置

博士留学研究生课程总学分为 15 学分，其中学位课程为 11 学分，非学位课程为 4 学分。另设教学环节。具体开设课程见附表。

Water Conservancy and Hydropower Engineering (081504)

Discipline: Engineering (08)

First-Class Discipline: Water Conservancy (0815)

1. Discipline Description

The discipline of Water Conservancy and Hydropower Engineering at Hohai University was founded in 1952. This discipline was granted the right to award Master degree in 1984. In 1993, the right to award Ph. Doctor Degree was granted to this discipline and the post-doctor research workshop was established. In 1996, this discipline was awarded the key discipline of the Ministry of Water resources of the People's Republic of China and granted as the National Key Discipline in 2007. This discipline is also the key discipline for the "211" National Construction Project and the Priority Academic Program Development of Jiangsu Higher Education Institutions. The main research platforms of this discipline include the State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering, and the National Engineering Research Center of Water Resources Efficient Utilization and Engineering Safety. In this discipline, there are more than 10 supervisors for Ph. D., nearly 20 supervisors for Master Degree, and about 10 off campus part-time supervisors for Ph. D.

All the research works in this discipline mainly focus on the large hydropower stations, the pumping stations, the pumped-storage power stations, the tide hydropower stations and the wind power etc., aim to investigate and solve the key technology problems in these hydraulic projects including energy planning, design theories, operation control etc., and emphasize the innovative and original research at the premise of balanced development. All the achievement has made great contribution to the development of waterpower engineering and new energy in the world. This discipline actively promotes the projects Funded by the Priority Academic Program Development, and is fully involved in the research for all the pumped-storage power stations and most of the great hydropower stations in China,

and undertakes “973” projects, “863” projects, the projects from the National Natural Science Foundation of China and other research works, and has gained many innovative research achievements in basic theories.

2. Program Description

The program in Water Conservancy and Hydropower Engineering aims to cultivate high-level talent PhD students in this field. Graduates in the discipline can master a solid broad basic theory and system of in-depth expertise as well as have the ability to work independently in scientific research. Besides, they can skillfully use modern basic theory and advanced computing methods and experimental techniques to carry out scientific research, and can use expertise to make innovative achievements. Graduates will be proficient in reading the professional foreign literature, with strong English writing and international academic communication skills. They can be competent for large-scale complex engineering key technology research and development, and can be qualified for higher education institutions and research institutions of teaching and research work.

3. Research Directions

- Water Resources and Hydropower System Planning and Development Strategy
- Hydraulics/Structure of Hydropower Plant and Pump Station
- Hydraulic Transient and Safety Control of Hydraulic Unit
- Technique of Pumped-storage Project and Renewable Energy

4. Application Requirements

(1) You have received the master degree from the domestic and overseas universities or academic institutions accredited by the Ministry of Education.

(2) You have the ability to read and write academic papers and communicate in English.

5. Educational System and Duration

The doctorate program is 4 years, the duration is minimum 3 years and no more than 6 years.

6. Credits and Courses

A doctoral student must take at least 15 credits of courses, including 11 credits of Required course of the degree and 4 credits of Non-required course of the degree.

水利水电工程全英文留学博士研究生课程设置

Courses for Doctoral Students of Water Conservancy and Hydropower Engineering

课程类别 Categories		课程编号 No	课程名称 Course	学时 Hours	学分 Credit	开课学期 Term	备注 Note
学位课程 11 学分 Required course of the degree 11 Credits	公共 课程 General Courses	2015LXS01	*汉语 I Chinese Language I	32	2	秋 fall	必修 RequiredC ourse
		2015LXS03	*中国概况 Introduction to China	32	2	秋 fall	
	基础 课程 Basic Courses	2015JC02	应用数学 Applied Mathematics	64	4	秋 fall	选修 4 学分 4 Credits at least
		2015JC03	数值分析 Numerical Analysis	48	3	秋 fall	
		2015JC04	最优化方法 Optimization Methods	32	2	秋 fall	
	专业 课程 Major Courses	2017SD13	水利工程学科前沿专题 Special Topics on Water Conservancy	16	1	春 Spring	必修 RequiredC ourse
		2015SD15	瞬变流 (二) Fluid Transients (II)	32	2	春 Spring	选修 2 学分 2 Credits at least
		2015SD16	水利水电系统规划新理论 New Theory of Water Resources and Hydropower System Planning	32	2	春 Spring	
	非学位课程 4 学分 Non-required course of the degree 4 Credits	2015SD17	水力机组测试与诊断 Detection & Fault Diagnosis of Hydroelectric Units	32	2	春 Spring	选修 2 学分 2 Credits at least
2015LXS07		英文科技写作 The Art of Scientific Presentation and Writing in English	32	2	秋、春 Fall or Spring		
2015LXS05		跨一级学科选修博士课程 A course in other disciplines	32	2		必修 RequiredC ourse	
教学环节 Academic Activities	学术活动 Seminar and Conferences						必修 RequiredC ourse
	科学研究 Scientific Research						
	文献阅读与综述 Literature Reading and Reviewing						