

# 水文学及水资源（081501）

学科门类：工学（08）一级学科：水利工程（0815）

## 一、专业描述

水文学及水资源专业主要研究地球上水的形成、分布和运动规律，以及水旱灾害防治、水资源开发利用、水环境改善与保护和水利工程运行与管理的基本理论与技术方法。它既有基础科学的本质，又有应用科学的内涵，是水利学科的重要组成部分。在人类认识自然、适应自然和改造自然的实践中，水文学及水资源学科具有极其重要的作用。

1952年，著名水文学家刘光文教授等在华东水利学院（河海大学前身）创建了我国第一个水文学及水资源学科。1981年首批获得学士、硕士和博士学位授予权，1988、2002、2007年连续三次被批准为国家重点学科（全国唯一），1990年获得世行重点学科建设项目的资助，1993年建成水资源开发利用国家专业实验室，1996年列入“211工程”重点学科建设项目，1997年联合国教科文组织通过专门议案，在我校设立国际水文水资源及环境培训与研究，2001年批准设立水资源开发教育部重点实验室，并列入“十五”“211工程”重点学科建设项目，2004年批准设立水文水资源与水利工程科学国家重点实验室。2005年获批建设水资源高效利用与工程安全国家工程研究中心。

河海大学水文学及水资源学科具有十分显著的优势：学科特色显著、学科梯队完整、学科平台基础雄厚。在2002年教育部组织的学科评审中，本学科综合实力再次位居全国第一。水文学及水资源学科具有一支理论基础深厚、

经验丰富的学术带头人和学术骨干队伍，现有教学和科研人员 60 多人，其中教授 30 多人，副教授 21 人，85% 的教师具有博士学位。围绕“水文特色，国际一流”建设目标，自“十一五”以来，本学科主持与承担了 766 项科研项目，经费总额 3.38 亿元，发表论文 2200 余篇，出版著作和教材 50 余部，获部省级以上科技奖 44 项，其中国家科技奖 2 项。河海大学水文学及水资源学科还接受联合国教科文组织（UNESCO）和世界气象组织（WMO）的委托，为 30 多个国家培养近 200 多名高级水文水资源及水环境人才。

## 二、培养目标

水文学及水资源专业全英文学术型硕士培养目标为：培养适应经济社会发展需要，在水文学及水资源学科领域内掌握坚实的基础理论和系统的专门知识，了解水文科学的现状和发展趋势，具备良好的国际视野、诚信的学术作风、积极的团队合作精神，具有从事科学研究工作或独立担负专门技术工作的能力，能够有效应用计算机开展科学研究和英语进行学术交流，了解中国文化并初步具备汉语日常交流能力的高层次学术型人才。

为学生提供良好的学术环境，使学生在导师的指导下，探索水循环及水资源演变机理，通过结合研究课题，应用获得的知识和技能解决实际问题，培养从事科学研究的能力。

## 三、研究方向

水文学及水资源专业全英文学术型硕士培养计划包括（但不限于）以下研究方向：

1. 水文物理规律模拟及水文预报；
2. 水文不确定性理论与应用；

3. 水资源系统规划及可持续利用；
4. 地下水系统理论与调控；
5. 水信息理论与技术；
6. 生态水文与环境水文；
7. 应用水文气象。

#### 四、申请条件

水文学及水资源全英文专业硕士生申请人需要满足以下条件：

- 1、已在我国认可的海内外高校或学术机构获得本科学位者。
- 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

学术型硕士学制为3年，实行弹性学制，学习年限最短不低于2年，最长不超过5年。

#### 六、学分要求和课程设置

本专业硕士留学研究生课程总学分为28学分，其中学位课程为18学分，非学位课程为10学分。另设教学环节。硕士生还必须结合研究课题完成一篇硕士论文，并通过答辩。水文学及水资源专业硕士课程设置如下表。

## **Hydrology and Water Resources (081501)**

Discipline: Engineering (08)

First-Class Discipline: Hydraulic Engineering (0815)

### **1. Discipline Description**

Hydrology and water resources is a discipline that mainly studies the formation, distribution and movement of water on the earth. It also studies the fundamental theory and techniques on flood/drought prevention, water resources development and utilization, aquatic environment protection and, hydraulic project operation and management. As an important branch of the discipline of hydraulic engineering, hydrology and water resources has the nature of both basic science and applied science. The discipline of hydrology and water resources plays an important role in the practices of understanding, adapting to transforming the nature.

The first discipline of hydrology and water resources in China was founded at East China Technical University of Water Resources (the former Hohai University) in 1952 by Prof. Liu Guangwen, a renowned hydrological scientist. The discipline was qualified for granting bachelor, master and doctoral degree in 1981, and was authorized as national key discipline in 1988, 2002 and 2007. In 1990, it was funded by World Bank's Key Discipline Development Program. National Specialized Laboratory of Water Resources Development and Utilization was founded in 1993. In 1996 the discipline of Hydrology and Water Resources was sponsored by the Key Discipline Construction Program of "211" Project. In 1997, UNESCO established the International Training and Research Center for Hydrology-Water Resources and Environment at Hohai University. In 2001, the Ministry of Education's Key Laboratory of Water Resources Development was established in Hohai University, and in the same year the discipline of hydrology and water resources was enrolled in the Key Discipline Construction Program under the sponsor of the Tenth Five-Year National Plan and "211" Project. In 2004 and 2005, State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering Sciences and National Engineering Research Center of Water Resources Efficient Utilization and Engineering Safety were founded respectively.

The discipline of hydrology and water resources has significant advantages with distinctive

academic characteristics, a comprehensive academic team and solid academic foundation. According to the evaluation by the Ministry of Education in 2002, the discipline was ranked as the top best in China. The discipline of Hydrology and Water Resources has several renowned academic leaders and a team of academic cadre with solid theoretical foundation and rich academic experiences. Currently the discipline has 60 faculties including over 30 professors and 21 associate professors. 85% of who has the doctor's degree. Since the Eleventh Five-Year National Plan, the discipline has undertaken 766 research projects with total funds of 338 million Yuan, and published 2200 papers and over 50 academic and course books. In addition, the discipline received 44 prizes, including 2 National Prizes for Progress in Science and Technology. Authorized by UNESCO and WMO, the discipline of hydrology and water resources has trained more than 200 senior talents of hydrology, water resources and water environment.

## **2. Program Description**

The program in Hydrology and Water Resources aims at cultivating high-level academic individuals with comprehensive fundamental knowledge and theory of hydrology and water resources, who are capable of getting insight into the status and development trend of hydrological science, and have good international visions, honest and team-work spirits. The program also aims at training high-level researchers who know about Chinese culture, are able to use the Chinese language for daily communication, and have the ability of using computers and English to carry out scientific research and academic exchange.

The program is designed to provide students with an intellectual environment to explore the knowledge and principles in hydrology and water resources through research project under guidance of an experienced supervisor. Through the program, students have opportunities to develop their problem-solving ability with new knowledge and skills, and to make their own contributions to their research field.

## **3. Research Directions**

- The PhD program in Hydrology and Water Resources is mainly oriented (but not limited) to the following research areas:
- Watershed hydrological simulation and forecasting

- Theory of hydrological uncertainty and application
- Water resources planning and management
- Numerical simulation and utilization of groundwater
- Theory and techniques of hydroinformatics
- Ecohydrology and environmental hydrology
- Applied hydrometeorology

#### **4. Application Requirements**

(1) You have received the bachelor 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 master program is 3 years; the duration is minimum 2 years and no more than 5 years.

#### **6. Credits and Courses**

A master student must take at least 28 credits of courses, including 18 credits of required course of the degree and 10 credits of Non-required course of the degree. A dissertation of the research subject and an oral defense are also required. Module structure of the doctorate program of Hydrology and Water Resources is listed below.

## 水文学及水资源全英文留学硕士研究生课程设置

### Courses for Master Students of Hydrology and Water Resources

课程类 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 19 学分 Required course of the degree 19 Credits	公共课程 General Courses	2015LXS01	*汉语 I Chinese Language I	32	2	秋 fall	必修 RequiredC ourse
		2015LXS02	汉语 II Chinese Language II	32	2	春 spring	
		2015LXS03	*中国概况 Introduction to China	32	2	秋 fall	
	学科基础课程 Discipline Basic Courses	2015JC03	数值分析 Numerical Analysis	48	3	秋 Fall	选修 6 学分 6Credits at least
		2015JC04	最优化方法 Optimization Methods	32	2	秋 Fall	
		2015JC01	数学物理方程 Partial Differential Equations	32	2	春 Spring	
		2015JC02	应用数学 Applied Mathematics	72	4	春 Spring	
	专业课程 Major Courses	2015SW04	地下水数值模拟 Numerical Simulation of Groundwater	18	1	春 Spring	必修 RequiredC ourse
		2015SW05	环境水力学 Environmental Hydraulics	32	2	春 Spring	
	专业基础课程 Major BasicCourses	2015SW06	现代水文模拟及预报 Modern Hydrological Modeling and Forecasting	32	2	春 Spring	必修 RequiredC ourse
		2015SW07	水资源规划与管理 Water Resources Planning and Management	32	2	春 Spring	
非学位课程 9 学分 Non-required course of the degree 9 Credits	2015LXS05	跨学科选修 A course in other disciplines	3 2	2		必修 RequiredC ourse	
	2015LXS06	综合素质课 Comprehensive Quality	18	1			
	2015SW08	水信息采集与处理 Collection of Water Information and Data Processing	32	3	春 Spring	必修 RequiredC ourse	
	2015SW09	水环境数学模型 Mathematic Model of Water Environment	32	2	春 Spring		
	2015LXS07	英文科技写作 The Art of Scientific Presentation and Writing in English	32	2			
教学环节 Academic Activities	学术活动 Seminar and Conferences					必修 Required Course	
	科学研究 Scientific Research						
	文献阅读与综述 Literature Reading and Reviewing						