

华北电力大学（留学生）英语授课

North China Electric Power University (International Student) Taught in English

水利工程一级学科硕士研究生培养方案

Training Program for Postgraduates in First-level Discipline of Hydraulic Engineering

(学科代码: 0815 授予工学硕士学位)

(Discipline Code: 0815, Degree: Master Degree of Engineering)

一、学科简介

I. Brief Introduction to the Discipline

华北电力大学水利工程学科依托能源电力行业,已发展成国内同类院校一流,具有鲜明能源电力特色的水利工程一级学科。学科起源于合并院校——北京动力经济学院及其前身北京水利电力经济管理学院,上世纪80年代初曾开设的水工结构工程和农田水利工程两个本科专业,并拥有农田水利工程专业硕士学位授予权。华北电力大学自2004年组建水利工程学科,从2006年在水文学及水资源二级学科硕士点开始招收研究生,2011年水利工程一级学科硕士点获批,2017年水利工程一级学科博士点获批。水利工程学科是华北电力大学重点打造的培养复合型高级技术人才,解决国民经济建设中水利水电工程、水电能源开发等领域相关问题,具有能源电力特色的重点学科。

Relying on the energy and power industry, the Hydraulic Engineering discipline of North China Electric Power University has developed into a first-level discipline with distinct energy and power characteristics in similar colleges and universities in China. The discipline originated from the merged university -- Beijing Institute of Power Economics and its predecessor, Beijing Institute of Water Conservancy and Electric Power Economics and Management, which had two bachelor's degree programs of Hydraulic Structure Engineering and Farmland Water Conservancy Engineering in the early 1980s, and had the right to grant a master's degree in Farmland and Water Conservancy Engineering. North China Electric Power University established the discipline of Hydraulic Engineering in 2004, and began to enroll postgraduates of the master program in second-level discipline of Hydrology and Water Resources in 2006. The master program in first-level discipline of Hydraulic Engineering was approved in 2011, and the doctoral program in first-level discipline of Hydraulic Engineering was approved in 2017. The discipline of Hydraulic Engineering is a key discipline with the characteristics of energy and electric power, which focuses on training senior compound technical talents, solving related problems in the fields of water conservancy and hydropower engineering, hydropower energy development and utilization in national economic construction.

水利工程是研究自然界水的运动规律以及人类改造自然以防止水患灾害,开发利用和保

护水资源的学科。我校水利工程学科成立以来，依托新能源电力系统国家重点实验室、能源的安全与清洁利用北京市重点实验室以及区域能源系统优化教育部重点实验室。先后建成了水电系统运行模拟与风险分析、水电站与岩土工程、水工与河流模拟 3 个实验中心，14 个实验室。在水资源持续利用与管理、防洪减灾理论及水安全分析、跨流域水电系统开发技术等方面逐步形成以“大电力”为特色的水电能源研究领域。

Hydraulic Engineering is a discipline that studies the movement law of water in nature and that human beings transform nature to prevent flood disasters, develop, utilize and protect water resources. Since the establishment of the Hydraulic Engineering discipline of our school, relying on the National Key Laboratory of New Energy Power System, the Beijing Key Laboratory of Energy Security and Clean Utilization, and the Key Laboratory of Regional Energy System Optimization of the Ministry of Education, our school has built 3 experimental centers for operation simulation and risk analysis of hydropower system, hydropower station and geotechnical engineering, hydraulic engineering and river simulation successively as well as 14 laboratories. The research field of hydropower energy characterized by "large power" has been gradually formed in the aspects of sustainable utilization and management of water resources, theory of flood control and disaster reduction and water security analysis, inter-basin hydropower system development technology, etc.

二、培养目标

II. Training Objectives

1. 遵纪守法，品行端正，具有实事求是、严谨的科学作风，具有较强的事业心和为科学献身的精神，积极为水利建设事业服务。

1. Abide by the law, good conduct, practical and realistic, with a rigorous scientific style, a strong career ambition and the spirit of devotion to science, actively serve the cause of water conservancy construction.

2. 在水利工程领域内掌握坚实的基础理论和系统的专业知识、较熟练的实践技能和较强的计算机应用能力，熟悉本研究领域中的发展动向，具有创新意识和独立从事科学研究或担任专门技术工作的能力。要求较熟练地掌握一门外国语，能够较熟练地阅读本专业的外文文献资料。

2. Master solid basic theory and systematic professional knowledge, proficient practical skills and strong computer application ability in the field of hydraulic engineering, be familiar with the development trends in this research field, and have the consciousness of innovation and the ability to engage in scientific research or specialized technical work independently. Students are required to be proficient in a foreign language and be able to read foreign literature of this major.

3. 身心健康。掌握一定程度的汉语，具备包容、认知和适应文化多样性的意识、知识、态度和技能，能够在不同民族、社会和国家之间的相互尊重、理解和团结中发挥作用。

3. Physical and mental health. Master a certain degree of Chinese, have the awareness, knowledge, attitude and skills of tolerating, cognizing and adapting to cultural diversity, and be able to play a role in mutual respect, understanding and unity among different nationalities, societies and countries.

三、研究方向

III. Research Direction

水利工程包含五个二级学科：水文学及水资源；水工结构工程；水利水电工程；水力学及河流动力学；港口、海岸及近海工程。目前我校开展的主要研究方向如下：

Hydraulic Engineering consists of five second-level disciplines: Hydrology and Water Resources, Hydraulic Structural Engineering, Water Conservancy and Hydropower Engineering, Hydraulics and River Dynamics, Port, Coastal and Offshore Engineering. At present, the main research directions of our school are as follows:

1. 水文预报与模拟

1. Hydrological Forecast and Simulation

2. 水资源配置与调度

2. Allocation and Dispatching of Water Resources

3. 水力学与河流动力学

3. Hydraulics and River Dynamics

4. 水信息学与数字流域

4. Water Informatics and Digital Watershed

5. 水工结构与岩土工程

5. Hydraulic Structure and Geotechnical Engineering

6. 水利水电工程建设与移民管理

6. Construction and Resettlement Management of Water Conservancy and Hydropower Engineering

7. 水环境与水生态

7. Water Environment and Water Ecology

四、培养方式

IV. Training Method

1. 硕士生的培养方式为导师负责制，导师是研究生培养第一责任人，要了解掌握研究生的思想状况，将专业教育与日常教育有机融合，既作学业导师，又做人生导师，严格要求学生遵守科学道德和学术规范。提倡按二级学科组成导师指导小组集体培养。对跨学科或交叉学科以及与有关研究部门、企业联合培养研究生时，应从相关学科及有关单位中聘请具有高级职称的有关人员进入导师指导小组协助指导。导师指导小组要负责审查研究生的文献综述

与选题报告、论文中期检查以及论文预答辩等培养环节的工作完成情况。

1. The training of postgraduates implements supervisor responsibility system, the supervisor is the person of primary responsibility for postgraduate training. The supervisor shall understand and master the specific condition of postgraduates and organically integrate professional education with daily education both as academic mentors and life mentors. The supervisor shall also strictly require students to abide by scientific ethics and academic norms. Advocate composing the supervisor steering group for collective cultivation according to the second-level disciplines. For interdisciplinary or cross-disciplinary training or training in conjunction with relevant research departments and enterprises, relevant personnel with senior professional titles shall be recruited from relevant disciplines and relevant units to assist in supervisor steering groups. The supervisor steering group is responsible to inspect the student's completion status of the literature review and thesis proposal, mid-term review and pre-defense of dissertation.

2. 导师应根据培养方案的要求，多方面了解所指导的硕士生的知识结构、学术特长、研究兴趣、能力基础等具体情况，据此制定出研究生个人培养计划，并督促检查其实施情况。

2. The supervisor should acknowledge the knowledge structure, academic skills, research interests, and abilities of the postgraduates according to the requirement of the training scheme, based on which to formulate a training plan for individual postgraduate and supervise the implementation according to the plan.

3. 硕士研究生的培养采用课程学习与科学研究并重的方式。既要使硕士生掌握坚实的基础理论和系统的专业知识，又要培养研究生掌握科学研究或独立担负设计、管理等方面工作的能力。

3. The training of postgraduates adopts the way of attaching equal importance to course learning and scientific research. It is necessary to make postgraduates master solid basic theory and systematic professional knowledge and cultivate postgraduates' ability to undertake scientific research or design and management work independently.

4. 导师应指导研究生学习有关课程，指导学位论文选题，检查科学研究进展情况，帮助解决科研中的困难，适时地指导研究生撰写论文，认真审阅学位论文，切实把好研究生的培养质量关。

4. The supervisor should guide postgraduates to study relevant courses, guide the topic selection of the degree thesis, check the progress of scientific research, help them solve the difficulties in scientific research, timely guide postgraduates to write the thesis, carefully review the degree thesis, and ensure the training quality of postgraduates.

五、学制与学习年限

V. Educational System and Duration of the Program

学制 3 年，学习年限 2-4 年。

The educational system is 3 years, and the duration of the program is 2-4 years.

六、课程设置与学分要求

VI. Curriculum and Credit Requirements

硕士生的课程学习实行学分制。要求各学科硕士生应修满的学分数为：总学分应不少于 28 学分，其中学位课不少于 22 学分。课程体系框架如下：

The course study of postgraduates implements credit system. The required credits for postgraduates in all disciplines: no less than 28 credits in total, including no less than 22 credits for degree courses. The curriculum framework is as follows:

1. 学位课（不少于 22 学分），其中：

1. Degree courses (no less than 22 credits), of which:

(1) 公共课：10 学分。

(1) Public courses: 10 credits.

汉语综合(1)：4 学分(64 学时)

Chinese Comprehension (1): 4 credits (64 class hours);

汉语综合(2)：4 学分(64 学时)

Chinese Comprehension (2): 4 credits (64 class hours);

中国概况(英文)：2 学分(32 学时)

Introduction to China (English): 2 credits (32 class hours);

(2) 数学基础课或基础理论课：不少于二门课程，4 学分。

(2) Basic mathematics courses or basic theoretical courses: No less than 2 courses, 4 credits.

(3) 学科基础课：按一级学科设置，不少于 4 学分。

(3) Basic courses of disciplines: Set up according to the first-level discipline, no less than 4 credits.

(4) 学科专业课：按一级或二级学科设置，不少于 4 学分。

(4) Specialized courses of disciplines: Set up according to the first-level or second-level discipline, no less than 4 credits.

各学科可以将学科基础课与学科专业课统筹设置，要求两项之和不少于 8 学分。

Each discipline shall have an overall planning of basic courses and specialized courses, and require that the total credits of the two shall be no less than 8 credits.

2. 必修课程与必修环节（6 学分），其中：

2. Compulsory courses and required links (6 credits), of which:

(1) 研究生科学道德与学术规范：1 学分。

(1) Scientific Ethics and Academic Norms for Postgraduates: 1 credit;

(2) 专题课程/seminar 课程：1 学分

(2) Program Course/Seminar Course: 1 credit.

专题课程/seminar 课程结合本领域学术前沿和研究生学位论文的选题进行设置。课程可采用教师讲授与研究生研讨相结合的方法进行学习。

Program course/seminar course shall be set up in combination with the academic frontiers in this field and the topic of master dissertation. The courses can be conducted by the combination of professor teaching with postgraduate discussion.

专题课程在研究生学位论文阶段完成。

The program course should be completed in the process of master dissertation.

(3) 实践环节：1 学分

(3) Practice Links: 1 credit.

实践环节包括实验教学、专业生产实践以及教学实践等。在第二、第三学期各院（系）及导师应安排研究生参加实践，如讲授大学本科课程的部分章节，参与指导课程设计、实习、实验、辅导答疑、课堂讨论等教学环节，或结合科研课题到生产单位参加调研或项目研发等实践工作，总工作量应达到 80 学时或 10 个工作日。

The practice links include experimental teaching, professional production practice and teaching practice, etc. In the second and third semesters, schools (departments) and supervisors shall arrange postgraduates to participate in practice. For example, teach some chapters of undergraduate courses, guide curriculum design, take an internship, do experiments, supervise and answer questions, and participate in classroom discussion and other teaching links, or participate in practical work such as research or project research and development in the production unit in combination with scientific research tasks. The total workload shall reach 80 class hours or 10 working days.

学院根据各学科特点和人才培养目标，依托本学科重点实验室、实践教学基地等开设具有特定主题的系列实验课或以实验为主的专题课；或与学科应用技术相关的硬件、软件设计或系统设计；或在本学科重点实验室、实践教学基地等进行工程设计、实验设备安装调试或协助实验室教师指导本科生完成实验教学等实验工作，以提高研究生的科研实践能力。

The school shall set up a series of experimental courses or experiment-based seminars with specific topics according to the characteristics of each discipline and the goal of personnel training and relying on the key laboratories and practical teaching bases of the discipline; or set up hardware and software design or system design related to the applied technologies of the discipline; or carry out engineering design, installation and debugging of experimental equipment in key laboratories and practical teaching bases of this discipline, or assist laboratory teachers to guide undergraduates to complete experimental teaching, so as to improve the practical ability of postgraduates in scientific research.

(4) 学术活动：1 学分，要求硕士生至少参加 6 次学术报告。

(4) Academic Activities: 1 credit, postgraduates are required to participate in at least 6 academic reports;

(5) 文献综述与开题报告：1 学分。

(5) Literature Review and Thesis Proposal: 1 credit;

(6) 论文中期检查：1 学分。

(6) Mid-term Review of the Thesis: 1 credit.

3. 非学位选修课

3. Non-degree optional courses

学生根据本人情况，可选修其他学科专业课和研究生课程目录上的课程，使总学分不少于 28 学分。学士阶段非本学科的硕士生应补修由导师指定的若干本学科学士阶段主干课程。补修课程不计入总学分。

Postgraduates can take specialized courses of other disciplines and courses in the catalogue of postgraduate courses according to their own situation, and the total credits shall not be less than 28 credits. Postgraduates who are not in their own disciplines at the bachelor stage should take several major courses of bachelor stage of the disciplines designated by their supervisors. Supplementary courses are not included in the total credit.

具体课程设置见附表。

For the specific curriculum, please refer to the Schedule.

七、科学研究与学位论文要求

VII. Requirements for Scientific Research and Degree Thesis

科学研究与学位论文工作是研究生培养的重要组成部分，是培养硕士研究生独立思考、勇于创新的精神和从事科学研究或担负专门技术工作能力的重要手段。硕士研究生应在导师指导下独立完成硕士学位论文工作。

Scientific research and degree thesis are important parts of postgraduate training, and important ways to cultivate postgraduates' independent thinking, innovative spirit and the ability to undertake scientific research or specialized technical work. Postgraduates should independently complete the master's degree thesis under the guidance of their supervisors.

1. 文献综述与开题报告

1. Literature review and thesis proposal

硕士生入学后应在导师指导下，查阅文献资料，了解学科现状和动态，尽早确定课题方向，完成论文选题。学位论文的选题一般应结合本学科的研究方向和科研项目，鼓励面向国民经济和社会发展的需要选择应用型课题。确定学位论文工作的内容和工作量时应全面考虑硕士研究生的知识结构、工作能力和培养年限等方面的特点。

After the enrollment, postgraduates should consult the literature, understand the current situation and trends of the discipline, determine the research direction as soon as possible, and complete the topic selection of the thesis under the guidance of their supervisors. The topic

selection of degree thesis should generally be combined with the research direction and scientific research projects of this discipline, and the selection of applied topics meeting the needs of national economic and social development is encouraged. When determining the content and workload of the degree thesis work, the supervisor should fully consider the knowledge structure, work abilities and training duration of postgraduates.

硕士开题由学院统一组织。全日制学术型硕士研究生的开题时间一般安排在硕士生入学后第3学期前进行。开题时间距离申请答辩日期一般不少于一学年。

The thesis proposal is uniformly organized by the school. The thesis proposal of full-time academic postgraduates is generally arranged before the third semester after the enrollment of postgraduates. The time for thesis proposal is generally not less than one academic year before the date of the application for defense.

对文献综述与开题报告工作的具体要求见《华北电力大学学术学位硕士研究生必修环节实施细则》。

For the specific requirements of literature review and thesis proposal, please refer to the Detailed Rules for the Implementation of Required Links for Postgraduates with Academic Degrees in North China Electric Power University.

2. 论文中期检查

2. Mid-term review of the thesis

全日制学术型硕士研究生的学位论文中期检查一般在第四学期末完成,提前毕业的全日制学术型研究生要求在第三学期末完成。中期检查的主要内容为:论文工作是否按开题报告预定的内容及进度进行;已完成的研究内容及结果;目前存在的或预期可能会出现的问题;论文按时完成的可能性等。对学位论文工作中期检查的具体要求见《华北电力大学学术型硕士研究生必修环节实施细则》。

The mid-term review of full-time academic postgraduates' degree thesis is generally completed at the end of the fourth semester, while that of full-time academic postgraduates who graduate ahead of time are required to be completed at the end of the third semester. The main contents of the mid-term review include whether the thesis work is consistent with the contents and schedule of the thesis proposal; the completed research contents and results; the existing or expected problems; and the possibility of completing the dissertation on time. For the specific requirements for the mid-term review of degree thesis work, refer to the Detailed Rules for the Implementation of Required Links for Postgraduates with Academic Degrees in North China Electric Power University.

3. 学术论文发表与科研成果要求

3. Requirements of academic papers and research achievements

(1) 以第一作者或第二作者(导师必须是第一作者)身份,在北大中文核心期刊、CSSCI、

CSCD 以及华北电力大学出版的 4 个期刊及以上刊物上公开发表（或网络见刊）或在国内外学术会议上交流反映学位论文工作成果的学术论文，且第一署名单位必须是华北电力大学。

(1) The postgraduate, as the first author or the second author (the supervisor must be the first author), publish academic theses reflecting the work achievements of degree theses in the Chinese core journals of Peking University, CSSCI, CSCD and 4 or more journals published by North China Electric Power University (or publish on the Internet), or exchange these academic theses at domestic and foreign academic conferences, and the first author affiliation must be North China Electric Power University.

(2) 获学校科研成果一、二等奖 1 项，本人排名在前 5 名。

(2) The postgraduate wins the first prize and second prize of the school's scientific research achievements and ranks in top 5.

(3) 研究生的学位论文工作成果（署名华北电力大学）获得省部级以上奖励 1 项，或获得国内外专利 1 项，或作为主研人完成的科研成果通过省、部级及以上鉴定 1 项。

(3) The work achievements of master dissertation (with North China Electric Power University as author affiliation) win one award at the provincial and ministerial level or above, or the postgraduate obtains a patent for invention at home and abroad, or the scientific research achievements which are completed by the postgraduate as the lead researcher have passed one appraisal at provincial and ministerial level or above.

4. 学位论文要求

4. Degree thesis requirements

硕士学位论文是硕士研究生科学研究工作的全面总结，是描述其研究成果、反映其研究水平的重要学术文献资料，是申请和授予硕士学位的基本依据。学位论文撰写是硕士生培养过程的基本训练之一，必须按照规范认真执行，具体要求见《华北电力大学学术硕士学位论文撰写规范及范例》。

Master dissertation is a comprehensive summary of postgraduates' scientific research work, an important academic literature that describes their research results and reflects their research level, it is the basis for applying for and awarding master's degrees. Degree thesis writing is one of the basic training in the training process of postgraduates, which must be carried out conscientiously in accordance with the norms. For specific requirements, please refer to Norms and Examples for the Writing of Academic Master Dissertation in North China Electric Power University.

5. 学位论文评审与答辩

5. Review and defense of degree thesis

学校统一进行硕士研究生论文的评审与答辩工作。研究生在论文工作完成后，须向所在院系提交论文答辩申请，相关部门对研究生的答辩资格进行审查，审查通过方可进入论文评

审与答辩程序。未通过答辩资格审查的硕士生不得进行论文答辩。

The school uniformly arranges the thesis review and defense of postgraduates. After the completion of the thesis work, the postgraduate shall submit the thesis defense application to the department, and the relevant departments shall examine the postgraduate's defense qualification. Those passing the examination can enter the thesis review and defense procedure. Postgraduates who fail to pass the examination of their qualification for defense shall not defense to their theses.

硕士学位论文的评审与答辩按照《华北电力大学研究生学位论文评审和答辩的有关规定》、《华北电力大学学位授予工作细则》等相关规定进行。毕业生的答辩时间一般安排在 6 月，延期毕业和提前毕业的研究生的答辩时间一般安排在 6 月或 12 月。

The review and defense of master's degree thesis shall be carried out in accordance with the Relevant Provisions on the Review and Defense of Master Dissertation of North China Electric Power University and the Detailed Rules of Degree Awarding of North China Electric Power University. The defense time for postgraduates is generally arranged in June, while that for postgraduates of postponed graduation and early graduation is generally arranged in June or December.

八、提前毕业条件

VIII. Conditions for Early Graduation

硕士研究生学业优秀者可以申请提前毕业，必须符合以下条件：

Excellent postgraduates can apply for early graduation, and must meet the following conditions:

(1) 已按硕士生个人培养计划的要求修完全部课程，无不及格课程；

(1) All courses have been completed in accordance with the requirements of the training plan for individual postgraduate, without failing course;

(2) 申请提前毕业的硕士研究生至少须以第一作者或第二作者（导师必须是第一作者）身份在本学科权威学术期刊公开发表（或网络见刊）学术论文 2 篇（权威学术期刊是指被 SCI 或 EI 收录期刊、一级学报、基金委管理学部认可的 A 类期刊）（增刊除外）。

(2) Postgraduates applying for early graduation shall publish at least 2 academic theses in the authoritative academic journals of the discipline (or publish on the Internet) as the first author or the second author (the supervisor must be the first author) (authoritative academic journals refer to journals included by SCI or EI, first-class academic journals and Class A journals approved by the Management Department of the Foundation Commission) (except supplements).

附表：水利工程一级学科学术学位硕士研究生培养方案（留学生）课程设置表（英语授课）

**Schedule:Curriculum (Taught in English) of Training Program for Postgraduates
(International Student) in First-level Discipline of Hydraulic Engineering**

类别 Category	课程名称 Course name	学时 Class hour	学分 Credit	考核方式 Assessment mode	开课学期 Semester of the course	备注 Remarks	
学位课 (不少于22学分) Degree courses (no less than 22 credits)	公共课(10学分) Public courses (10 credits)	汉语综合(1) Chinese Comprehension (1)	64	4	考试 Exam	1	
		中国概况(英文) Introduction to China (English)	32	2	考试 Exam	1	
		汉语综合(2) Chinese Comprehension (2)	64	4	考试 Exam	2	
	基础理论课 Basic theoretical courses	矩阵论 Matrix Theory	32	2	考试 Exam	1	
		数值分析 Numerical Analysis	32	2	考试 Exam	1	
	学科基础课 Basic courses of disciplines	高等水文学 Higher Hydrology	32	2	考试 Exam	1	
		高等流体力学 Advanced Fluid Mechanics	32	2	考试 Exam	1	
	学科专业课 Specialized courses of disciplines	环境水文学 Environmental Hydrology	32	2	考试 Exam	2	
		城市水环境与生态系统 Urban Water Environment and Ecosystem	32	2	考试 Exam	2	
		河流综合管理 Integrated River Management	32	2	考试 Exam	2	
		高等水工结构 Advanced Hydraulic Structure	32	2	考试 Exam	2	
	非学位课 Non-degree courses	必修课程与必修环节(6学分) Compulsory courses and required links (6 credits)	研究生科学道德与学术规范 Scientific Ethics and Academic Norms for Postgraduates		1	考查 Review of performance	
			专题课程/seminar 课程 Program Course/Seminar Course		1	考查 Review of performance	
			实践环节(实验、实践) Practice Links (Experiment, Practice)		1	考查 Review of performance	
学术活动 Academic Activities				1	考查 Review of performance		
文献综述与选题报告 Literature Review and Thesis Proposal				1	考查 Review of performance		

		论文中期检查 Mid-term Review of the Thesis		1	考查 Review of performance		
	选修课 Optional courses	科技信息检索与论文写作专题讲座 Symposium on Sci-tech Information Search and Thesis Writing		1	考查 Review of performance		
		选修课门数及课程根据招生规模及社会需求设置 The optional courses and their numbers will be determined according to the enrollment scale and social needs					