

华北电力大学（留学生）英语授课

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

机械工程学科硕士研究生培养方案

Training Program for Postgraduates in Discipline of Mechanical Engineering

（学科代码：0802 授予工学硕士学位）

(Discipline Code: 0802, Degree: Master Degree of Engineering)

一、学科简介

I. Brief Introduction to the Discipline

机械工程学科 1981 年获得硕士学位授予权，2002 年机械设计及理论成为省部级重点学科，2005 年获机械工程一级学科硕士学位授予权。本学科攻克了多项大型发电设备关键技术，先后获得五项国家科技进步奖和二十余项省级科技进步奖，成功研制国内首台大型中频弯管机，为我国电力工业技术进步做出了巨大贡献。

Our school acquired the right to grant the master's degree for the discipline of Mechanical Engineering in 1981. The discipline of Mechanical Design and Theory became a provincial and ministerial key discipline in 2002. And we also acquired the right to grant the master's degree in the first-level discipline of Mechanical Engineering in 2005. This discipline has conquered a number of key technologies of large-scale power generation equipment, winning five national scientific and technological progress awards and more than 20 provincial-level awards for scientific and technological progress, and has successfully developed the first large-scale medium frequency pipe bender in China, and made great contributions to the technological progress of China's electric power industry.

二、培养目标

II. Training Objectives

1. 培养对中国有良好认知，理解中国社会主流价值观，具有相应的中文语言能力，具备一定跨文化和全球胜任力，在所在学科具有相当专业知识和学术能力的国际化人才。

1. Cultivate international talents who have a good understanding of China, understand the mainstream values of Chinese society, have corresponding Chinese language skills, have certain cross-cultural and global competencies, and have considerable professional knowledge and academic abilities in their disciplines.

2. 掌握机械工程领域坚实的基础理论和系统的专门知识，深入了解本领域的先进技术和发展动态，具有从事科学研究工作或独立担负专门技术工作的能力，能够解决与本领域有关的理论问题和工程技术问题。

2. Master solid basic theory and systematic expertise in the field of mechanical engineering, have an in-depth understanding of the advanced technology and development trends in this field, have the abilities to engage in scientific research or undertake specialized technical work independently, and be able to solve theoretical problems and engineering and technical problems related to this field.

三、研究方向

III. Research Direction

1. 机械制造及其自动化
1. Mechanical Manufacture and Automation
2. 机械电子工程
2. Mechanical and Electronic Engineering
3. 机械设计及理论
3. Mechanical Design and Theory
4. 输电线路工程
4. Transmission Line Engineering

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，又作人生导师，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 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 should 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 shall acknowledge the knowledge structure, academic skills, research interests, and abilities of the master candidates according to the requirement of the training program, based on which to formulate a training plan for individual graduate student 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 shall 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 32 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 32 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 32 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 32 credits.

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 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 dissertation 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.

硕士开题由院系统一组织。全日制学术型硕士研究生文献综述与开题报告会一般要求在第二学期末前完成，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 or department. The literature review and thesis proposal of full-time academic postgraduates is generally required to be completed at the end of the second semester, and the time for submitting thesis proposal is at least one academic year before the thesis 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

学位论文实行中期检查制度。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，2年毕业的全日制学术型研究生要求在第四学期的前三周内完成。按专业方向组织考核小组（3-5人组成）对研究生的论文工作进展以及工作态度、论文完成的可能性等进行全方位的考查。

A mid-term review system is adopted for degree thesis. The mid-term review of full-time academic postgraduate dissertation is usually completed at the end of the fourth semester, and full-time academic postgraduates applying for graduation after two-year study are required to complete it within the first three weeks of the fourth semester. Organize an assessment team (composed of 3-5 members) according to majors to conduct an all-round review of the progress of the dissertation work of the postgraduate students, their work attitude and the possibility of completing the dissertation.

3. 科研成果要求

3. Requirements for scientific research achievements

鼓励留学生公开发表与研究工作相关的学术论文。

International students are encouraged to publish academic papers related to their research work.

4. 学位论文要求

4. Degree thesis requirements

硕士学位论文是硕士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, is an important academic literature that describes their research results and reflects their research level, and 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

学校集中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，相关部门要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 review and defense of postgraduate thesis shall be conducted in an intensive manner. Postgraduates should submit the application for thesis defense to their departments after the completion of the thesis work, and the relevant departments shall examine the postgraduates' defense qualification and they are allowed to enter the thesis review and defense procedure only after they pass the examination. 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 dissertation 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 2 年毕业，必须符合以下条件：

Particularly outstanding postgraduates can apply for graduation after 2 years of study on the basis of meeting the following conditions:

正式发表 SCI 期刊（不含开源期刊）或一级学报论文 2 篇。国际或国内一级学会大会优秀论文奖论文，或研究生的学位论文工作成果（署名华北电力大学）获得省部级三等及以上奖励一项（本人排在前 5 名），或获得国内外发明专利 1 项，至多可相当于前述论文 1 篇。

They have officially published 2 papers in SCI journals (not including open access journals) or first-class journals. The thesis is granted with Excellent Thesis Award of first-class international or domestic association conference, or the work achievements of master dissertation (with North China Electric Power University as the author affiliation) win a provincial-and-ministerial-level third-class or above award (the postgraduate is in the top 5), or the postgraduate obtains a patent for invention at home and abroad, which can be equivalent to at most one of the above-mentioned theses.

附表：机械工程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 Discipline of Mechanical 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)	(10 学分) (10 credits) 公共课 Public courses	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
	(不少于 4 学分) (No less than 4 credits) 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
	(不少于 4 学分) (No less than 4 credits) 学学科基础课 Basic courses of the disciplines	工程优化方法 Engineering Optimization Method	32	2	考试 Exam	2
		现代测试技术 Modern Testing Technology	32	2	考试 Exam	1
		机电系统工程学 Electromechanical System Engineering	32	2	考试 Exam	1
		高等材料力学 Advanced Material Mechanics	32	2	考试 Exam	1
		机械系统动力学 Mechanical System Dynamics	32	2	考试 Exam	1
		现代设计方法学 Modern Design Methodology	32	2	考试 Exam	1
	(不少于 4 学分) (No less than 4 credits) 学科专业课 Specialized courses of disciplines	专业英语 Specialty English	16	1	考试 Exam	2
		机械工程前沿 Mechanical Engineering Frontier	16	1	考试 Exam	1
		数字化设计与制造 Digital Design and Manufacturing	32	2	考试 Exam	1
		智能制造系统 Intelligent Manufacturing System	32	2	考试 Exam	2
		计算机集成制造系统 Computer Integrated Manufacturing System	32	2	考试 Exam	2
		先进制造技术 Advanced Manufacturing Technology	32	2	考试 Exam	2

		机器人学 Robotics	32	2	考试 Exam	2
		现代精密加工与超精密加工技术 Modern Precision Machining and Ultra-precision Machining Technology	32	2	考试 Exam	2
		工业检测技术 Industrial Testing Technology	32	2	考试 Exam	2
		机电系统建模与特性分析 Modeling and Characteristic Analysis of Electromechanical System	32	2	考试 Exam	2
		机械故障诊断学 Mechanical Fault Diagnostics	32	2	考试 Exam	2
		振动和模态分析 Vibration and Modal Analysis	32	2	考试 Exam	2
		有限元分析及应用 Finite Element Analysis and Application	32	2	考试 Exam	2
		结构高等设计方法 Advanced Design Method of Structure	32	2	考试 Exam	2
		人机工程学 Ergonomics	32	2	考试 Exam	2
		结构设计与数值软件应用 Structural Design and Application of Numerical Software	32	2	考试 Exam	2
		风电机组设计技术 Design Technology of Wind Turbine Generator	32	2	考试 Exam	2
		现代设备工程学 Modern Equipment Engineering	32	2	考试 Exam	2
		摩擦与磨损 Friction and Wear	32	2	考试 Exam	2
非学位课 Non-degree courses	(6学分) (6 credits) 必修课程与必修环节 Compulsory courses and required links	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		1	考查 Review of	

		Mid-term Review of the Thesis			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		
		先进工程材料及其高效加工技术 Advanced Engineering Material and Efficient Processing Technology	32	2	考试 Exam	2	
		光机电技术及应用 Opto-mechanical and Electrical Technology and Application	32	2	考试 Exam	2	
		现代仪器分析技术及应用 Modern Instrument Analysis Technology and Application	32	2	考试 Exam	2	
		精密部件机电耦合分析 Electromechanical Coupling Analysis of Precision Component	32	2	考试 Exam	2	
		转子动力学 Rotor Dynamics	32	2	考试 Exam	1	
		汽轮发电机组振动 Vibration of Steam Turbine Generator Set	32	2	考试 Exam	2	
		导线力学与防舞技术 Wire Mechanics and Anti-dance Technology	32	2	考试 Exam	2	
		特高压铁塔结构设计 Structural Design of UHV Tower	32	2	考试 Exam	2	
		铁塔基础设计 Tower Foundation Design	32	2	考试 Exam	2	
		电力材料与设备 Electric Power Material and Equipment	32	2	考试 Exam	2	
		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					