电气工程（0808）
Electrical Engineering

学科门类：工学（08）　一级学科：电气工程（0808）

Discipline Category: Engineering (08)

First-Class Discipline: Electrical Engineering (0808)

一、学科简介

河海大学电气工程学科成立于 1987 年，1993 年获得电力系统及其自动化硕士学位授予权，2003 年获得电力系统及其自动化博士学位授予权，2005 年获得电气工程一级学科硕士学位授予权，2009 年设立电力系统及其自动化专业博士后流动站，2010 年获得电气工程一级学科博士学位授予权，2020 年入选教育部“双万计划”国家级一流本科专业，是“十三五”和“十四五”江苏省重点学科。

本学科发展战略是“入主流，有特色”，紧紧围绕“建设以新能源为主体的新型电力系统”和“双碳”等国家重大战略需求，积极对接风力发电、太阳能发电等江苏省优势产业和优先重点发展领域，形成了电力系统建模与控制、配用电与综合能源系统、可再生能源并网与控制、电机系统与电力变换、“新-水-电”协同控制为代表的 5 个主要研究方向。近年来取得了一系列标志性成果：以河海大学为第一完成单位获得 2017 年国家科技进步奖二等奖、2019 年江苏省科学技术二等奖；作为合作单位获得 2017 年和 2019 年江苏省科学技术一等奖；新增江苏省“六大人才高峰”创新团队 1 支、江苏省“特聘教授”1 名、省级人才计划入选者 5 人次，获批国家重点研发计划 1 项，国家自然科学基金重点项目 2 项、面上和青年项目 20 余项。

本学科现有专职教师 53 名，正高级职称 14 名，副高级职称 19 名，博士 52 名，博导 11 名；国家杰出青年科学基金和优秀青年科学基金获得者各 1 名；本学科还拥有“新能源发电与智能电网学科创新引智基地”、“教育部可再生能源发电技术工程研究中心”、“江苏省配用电与能效工程技术研究中心”、“江苏省沿海开发协同创新中心”等省部级平台，支撑和服务学校水利、环境等双一流学科群，

形成电气+清洁能源的学科体系。毕业生广泛分布在全国各大电网公司、电力设计院、发电集团以及其他与电力相关的企业。

I. Discipline Overview

The electrical engineering discipline of Hohai University was established in 1987, which was authorized to confer the master degree and doctor degree in power system and automation in 1993 and 2003, respectively, and later acquired the right to confer the master degree of first-class discipline in electrical engineering in 2005. In 2009, the post-doctoral mobile station of power system and automation was established. In 2010, it was granted the right to confer a doctorate degree in the first-level discipline of electrical engineering. In 2020, it was selected as a national first-class undergraduate major in the "Double Ten Thousand Plan" of the Ministry of Education and was successively selected as a key discipline in the "13th Five-Year Plan" and "14th Five-Year Plan" of Jiangsu Province.

The development strategy of this discipline is to "enter the mainstream, have the characteristics," and closely focus on the major national strategic needs such as "building the new power system with new energy as the principal part" and "carbon peaking and carbon neutrality goals", and actively connect with the dominant industries and priority areas of Jiangsu Province, such as wind power generation and solar power generation. There are five main research directions formed, namely power system modeling and control, power distribution and integrated energy system, renewable energy grid integration and control, motor system and power conversion, and "new-water-electricity" collaborative control. In recent years, a series of landmark achievements have been made: The 2nd prize of the National Science and Technology Progress Award in 2017 and the 2nd prize of Jiangsu Province Science and Technology Award in 2019 with Hohai University as the 1st completion unit; The 1st prize of Jiangsu Science and Technology Award in 2017 and 2019 as a cooperative unit; Besides, there are 1 new innovation team of "Six Talent Peaks" of Jiangsu Province, 1 "Distinguished Professor" of Jiangsu Province, 5 scholars selected for Provincial Talent Plan, 1 approved project of National Key Research and Development Plan, 2 key projects of the National Natural Science Foundation of China,

more than 20 General and Youth Projects, and 1 IEEE International Conference, as well as 1 Frontier Symposium of Young Scholars in Electrical Discipline of the Fund Committee.

The discipline currently has 53 full-time teachers, 14 senior titles, 19 senior deputy titles, 52 doctors, 11 doctoral advisors, 1 recipient of the National Science Fund for Distinguished Youth Scholars, and 1 recipient of the Outstanding Youth Science Fund. Besides, there are provincial and ministerial platforms such as "New Energy Power Generation and Smart Grid Discipline Innovation and Intelligence Base," "Renewable Energy Power Generation Technology Engineering Research Center of the Ministry of Education," "Jiangsu Province Electricity Distribution and Energy Efficiency Engineering Technology Research Center," and "Jiangsu Province Coastal Development Collaborative Innovation Center." These platforms support and serve the double first-class disciplines such as water conservancy and environment, and formed a discipline system of "electrical + clean energy." The graduates are widely distributed in major power grid companies, power design institutes, power generation groups, and other electricity-related corporations.

二、培养目标

1. 河海大学博士层次外国留学生应当在电气工程领域中具有宽阔的国际视野，能够在世界范围内创新运用和发展电气工程的理论、技能和方法，在国际事务中具有竞争优势。

2. 以英语为专业教学语言的学科中，外国留学生毕业时，博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. 本学科博士留学研究生旨在培养电气工程领域坚实宽广的基础理论和系统深入的专门知识，在电力系统、电力电子、高电压和电机方向研究、设计、开发、施工和管理等专门科研技术工作中具有强的专业能力和职业素养；具有独立从事科学研究工作或独立担负专门技术工作的能力；了解中国文化并具备汉语日常交流能力的高层次专门人才。

II. Training Objectives

1. International PhD graduates of Hohai University are expected to have broad international view in the

relevant academic fields; to creatively apply and develop the theories, skills, and methodologies of the relevant disciplines in the world, and to obtain competitive advantage in the international academic affairs.

2. International PhD graduates must meet the requirement of Level 3 in Chinese Language Proficiency Scales upon graduation if they conduct their coursework in English.

3. This Ph. D discipline aims to cultivate senior professionals in the field of electrical engineering. To master and broad solid basic theory and systematic andin-depth specialized knowledge of electrical engineering and have strong professional ability and professionalism in the research, design, development, construction and management of power systems, power electronics, high voltage, and motors. Having the ability to engage in scientific research or independently undertake a special technical and research work. To cultivate senior professionals who understand Chinese culture and have the ability to communicate in Chinese.

三、主要研究方向

1. 电力系统建模与控制

2. 配用电与综合能源系统

3. 可再生能源并网与控制

4. 电机系统与电力变换

5. “新-水-电”协同控制

III. Research Directions

1. Power System Modeling and Control

2. Power Distribution and Integrated Energy System

3. Control of Renewable Energy Integrating into Power Grid

4. Electrical Driving System and Power Conversion

5. Collaborative Control of "Renewable Energy, Hydro Power, and Power System"

四、学制和学习年限

学术学位全英文博士留学研究生的标准学制为 4 年。实行弹性学制，学习年限最短不少于 3 年，最长不超过 6 年。

IV. Number of Years Requirement

The PhD program typically requires 4 years to complete. However, the completing time may vary to 3 years as the minimum and 6 years as the maximum.

五、学分要求和课程设置

1. 学术学位全英文博士留学研究生课程总学分为 15 学分，其中学位课程为 10 学分，非学位课程为 5 学分。另设教学环节。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 PhD students will complete 15 credits, 10 of which are from degree courses, and 5 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 PhD degree, Chinese language

courses can be exempted, of which the details can be referred to in relevant regulations.

The specific curriculum is as follows:

电气工程全英文学术型留学博士研究生课程设置

Curriculum for English Taught International Academic PhD Students in Electrical 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 10 学分	公共课程 General Course	2022LD000001	汉语 I Chinese Language I	2	48	秋 Autumn	必修 Compulsory
		2022LD000003	中国概况 Introduction to China	2	36	秋 Autumn	
		2022LD110001	论文写作指导 Guide of Thesis Writing	2	32	秋、春 Autumn/ Spring	
	基础课程 Basic Course	2022LD880001	应用数学 Applied Mathematics	4	64	秋 Autumn	选修 2 学分 Optional 2 credits at least
		2022LD060001	高级综合能源系统 Advanced Integrated Energy System	2	32	春 Spring	
	专业课程 Major Course	2022LD060002	清洁能源发电与输电技术 Clean Energy Generation and Power Transmission Technology	2	32	春 Spring	选修 2 学分 Optional 2 credits at least
		2022LD060003	新能源电力系统建模与分析 Renewable Energy Power System Modeling and Analysis	2	32	春 Spring	
非学位课程 Non-degree Course 5 学分		2022LD110002	中国国情教育（水韵课堂） Water Harmony Lectures	1	16	秋、春 Autumn/ Spring	必修 Compulsory
		2022LD000002	汉语 II Chinese Language II	2	48	春 Spring	
		2022LD550001	战略、技术与管理 Strategy, Technology and Management	2	32	秋 Autumn	选修 2 学分 Optional 2 credits at least
		2022LD550002	高级宏观经济学 Advanced Macro-Economics	2	32	秋 Autumn	
		2022LD880003	随机微分方程 Stochastic Differential Equations	2	32	春 Spring	
		选修博士课程 Optional courses for PhD					选修 Optional
教学环节 Academic Activity		学术活动（含博导讲座） Seminar and Conferences (including seminars by PhD advisors)					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

学术学位博士研究生入学后，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

学术学位博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、博士生导师讲座，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 20 次以上的学术交流活动，其中博士生导师讲座至少 8 次，由本人做的公开的学术报告 1 次（开题报告、中期检查、预答辩、答辩不计入）。本人做的学术报告由指导教师负责对其学术报告效果进行考核。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，学术学位博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。

4. 科学研究

学术学位博士研究生应积极参加科学研究课题，并应具有在导师指导下独立负责某专题或子课题的研究工作经历。课题完成后由导师提出综合评审意见。

VI. Academic Activities

1. Study Proposal

The PhD students must prepare a study proposal on how they will complete the PhD 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

PhD students must participate in academic conferences, seminars by experts and PhD advisors, and discussion panels. Before their dissertation defense, PhD students must participate in seminars and

conferences over 20 times, including at least 8 seminars by PhD advisors, and deliver at least 1 academic presentation (the activities concerning with their dissertation are not counted). The presentations delivered by the PhD students will be evaluated by their own research advisors. All the seminars and presentations should be recorded in relevant record book.

3. Practice Activities

PhD 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.

4. Scientific Research

International academic PhD students should vigorously participate in scientific research projects, and shall be capable of conducting independent research on a particular topic or sub-topic under the guidance of their advisors. Their performance will be evaluated by their research advisors.

七、论文工作

学术学位博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《河海大学博士学位论文工作管理办法》和学院相关文件执行。留学博士研究生可使用英文撰写论文。

VII. Dissertation

The dissertations of academic PhD 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 PhD. Dissertation Management Measures” and relevant documents in College of Energy and Electrical Engineering. Dissertations 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. 鞠平, 吴峰, 金宇清, 潘学萍, 袁越, 秦川. 可再生能源发电系统的建模与控制[M]. 北京: 科学出版社, 2014.

2. Ping Ju. Stochastic Dynamics of Power Systems. Singapore[M]: Springer Nature Singapore Pte Ltd., 2018.

3. 鞠平. 电力系统建模理论与方法[M].北京:科学出版社,2010.

4. 鞠平. 现代电力系统控制与辨识[M].北京:清华大学出版社,2015.

5. 鞠平,吴峰,金宇清,等. 可再生能源发电系统的建模与控制[M].北京:科学出版社,2014.

6. 鞠平. 电力系统建模理论与方法[M].北京:科学出版社,2010.

7. 鞠平,代飞,金宇清,等. 电力系统广域测量技术[M].北京:机械工业出版社,2008.

8. 陈星莺,余昆. 智能配电网自愈控制理论[M].北京:中国电力出版社,2020.

9. 王锡凡. 现代电力系统分析[M].北京:科学出版社,2003.

10. 张伯明,陈寿孙,严正. 高等电力网络分析[M].北京:清华大学出版社,2007.

11. 李光琦. 电力系统暂态分析[M].北京:中国电力出版社,2007.

12. 诸骏伟. 电力系统分析(上下册)[M].北京:水利电力出版社,1995

13. 夏道止. 电力系统分析(下册)[M].北京:中国电力出版社,2002.

14. 倪以信,陈寿孙,张宝霖. 动态电力系统的理论与分析[M].北京:清华大学出版社,2002.

15. 卢强,梅生伟,孙元章. 电力系统非线性控制[M].北京:清华大学出版社,2008.

16. 余贻鑫,王成山. 电力系统稳定性理论与方法[M].北京:科学出版社,1999.

17. 陈维贤. 超高压电网稳态计算[M].北京:水利电力出版社,1993 年

18. 贺家李. 电力系统继电保护原理[M].北京:中国电力出版社，2009.

19. 张保会,尹相根. 电力系统继电保护(第二版)[M].北京:中国电力出版社,2010.

20. 杨冠城. 电力系统自动装置原理(第四版)[M].北京:中国电力出版社,2007.

21. 崔家佩. 电力系统继电保护与安全自动装置整定计算[M].北京:中国电力出版社,2006.

22. 刘志刚. 电力电子学[M].北京:清华大学出版社,2004.

23. 周渊深. 电力电子技术与 MATLAB 仿真(第二版)[M].北京:中国电力出版社,2014.

24. 张兴,杜少武,黄海宏. 电力电子技术[M].北京:科学出版社,2010.

25. 王守相,王成山. 现代配电系统分析[M].北京:高等教育出版社,2007

26. 谢小荣,姜齐荣. 灵活交流输电系统的原理与应用[M].北京:清华大学出版社.2006

27. 杜松怀,文福栓等译. 电力系统的市场化运营[M].北京:中国电力出版社,2005

28. 朱德恒,严璋,谈克雄. 电气设备状态监测与故障诊断技术[M].北京:中国电力出版社,2009

29. 陈星莺,余昆. 智能配电网[M].北京:中国电力出版社,2020.

30. 潘学萍. 电力系统低频振荡[M].北京:中国水利水电出版社,2013.

31. Rakosh Das Begamudre(加),丛伟(译). 超高压交流输电工程(第三版)[M].北京:机械工业出版社,2008.

32. Gomez-Exposito A, Conejo A J, Canizares C. Electric energy systems: analysis and operation[M]. CRC press, 2018.

33. Prabha Kundur. Power system stability and control[M]. McGraw-hill companies,Inc 1994.

34. T. V. Cutsem, C．D． Vournas. Voltage Stability of Electric Power Systems[M]. Boston, MA: Kluwer Academic Publishers,1998.

35. 期刊：中国电机工程学报

36. 期刊：电工技术学报

37. 期刊：电力系统自动化

38. 期刊：电机与控制学报

39. 期刊：太阳能学报

40. 期刊：电力自动化设备

41. 期刊：电网技术

42. 期刊：高电压技术

43. 期刊：电力系统及其自动化学报

44. 期刊：IEEE Transactions on Power Systems

45. 期刊：IEEE Transactions on Power Delivery

46. 期刊：IEEE Transactions on Smart Grid

47. 期刊：IEEE Transactions on Sustainable Energy

48. 期刊：IET Generation, Transmission & Distribution

49. 期刊：IET Renewable Power Generation

50. 期刊：Wind Energy

51. 期刊：Renewable Energy

52. 期刊：IET Renewable Power Generation

53. 期刊：International Journal of Electrical Power & Energy Systems

54. 期刊：Journal of Modern Power Systems and Clean Energy