

信息与通信工程 (0810)

Information and Communication Engineering

学科门类：工学 (08) 一级学科：信息与通信工程 (0810)

Discipline Category: Engineering (08)

First-Class Discipline: Information and Communication Engineering (0810)

一、学科简介

河海大学“信息与通信工程”学科源于 1960 年我校设立的“无线电设计与制造专业”，已有 56 年的发展历史。1998 年获批通信与信息系统二级硕士点，2005 年获批信息与通信工程一级硕士点，2011 年获批信息与通信工程一级博士点。2008 年通信工程专业获批江苏省精品专业，2010 年评为国家特色专业。

学科围绕“信息获取与处理、通信传输、领域应用”信息链，以行业重大需求为导向，在多维信号处理、遥测与遥感系统、通信网与专用通信系统、微波与探测技术、信息与系统集成及应用等几个方向形成了与国际研究前沿/热点接轨、与工程应用技术紧密结合的鲜明特色。本一级学科现有教授 13 名，博导 11 名，其中，二级教授 2 名，江苏省教学名师 1 名，江苏省“333”高层次人才 3 名，江苏省高校“青蓝工程”学术带头人 6 名。海外取得博士学位占专任教师总人数的 31.1%，45 岁以下青年教师具有海外留学经历的比例为 100%。学科还拥有江苏省海洋监测设备与数据处理工程中心和江苏省水灾害监控与决策支持系统工程中心。研究生就业单位有机关事业单位、高校和科研机构、大中型 IT 企业等。

本学科建设目标是建设成为水利海洋信息化与专用通信系统发展方向的引领者，水利海洋行业通信与信息工程关键科学技术的顶级研究和创新基地，信息与通信工程高级人才的培养基地。

I. Discipline Overview

The discipline of "information and Communication Engineering" in Hohai University originates from

the "radio design and manufacturing specialty" established by our university in 1960, and has a development history of 56 years. In 1998, it was approved as the second level master program of communication and information system, the first level master program of information and communication engineering in 2005 and the first level doctoral program of information and communication engineering in 2011. In 2008, the major of communication engineering was approved as a high-quality major in Jiangsu Province and rated as a national characteristic major in 2010.

Focusing on the information chain of "information acquisition and processing, communication transmission and field application", and guided by the major needs of the industry, the discipline has formed distinctive characteristics of connecting with international research frontiers / hotspots and closely combining with engineering application technology in several directions, such as multi-dimensional signal processing, telemetry and remote sensing system, communication network and special communication system, microwave and detection technology, information and system integration and application. There are 13 professors and 11 doctoral tutors in the first level discipline, including 2 second level professors, 1 famous teaching teacher in Jiangsu Province, 3 "333" high-level talents in Jiangsu Province, and 6 academic leaders of "Blue Project" in Colleges and universities in Jiangsu Province. 31.1% of the total number of full-time teachers have obtained doctoral degrees overseas, and 100% of young and middle-aged teachers under the age of 45 have overseas study experience. The discipline also has Jiangsu marine monitoring equipment and data processing engineering center and Jiangsu water disaster monitoring and decision support system engineering center. Graduate employment units include government institutions, universities and scientific research institutions, large and medium-sized IT enterprises, etc.

The construction goal of this discipline is to become the leader in the development direction of water conservancy and marine informatization and special communication system, the top research and innovation base of key science and technology of communication and Information Engineering in water conservancy and marine industry, and the training base of senior talents of information and communication engineering.

二、培养目标

1. 河海大学博士层次外国留学生应当在信息与通信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信息与通信工程的理论、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信息与通信工程领域的高层次人才。培养在信息与通信工程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；在科学或专门技术上做出创造性的成果；能够熟练应用信息与通信工程技术开展科学研究和英语进行学术交流，了解中国文化并具备汉语日常交流能力的高层次学术型人才。

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. The purpose of doctoral students in this discipline is to cultivate high-level talents in the field of information and communication engineering. Train students to master solid and broad basic theories and systematic and in-depth expertise in the discipline of information and communication engineering; Have the ability to engage in scientific research independently; Making creative achievements in science or special technology; High level academic talents who can skillfully apply information and communication engineering technology to carry out scientific research and academic exchanges in English, understand Chinese culture and have the ability of daily communication in Chinese.

三、主要研究方向

1. 多维信号处理
2. 遥测与遥感系统
3. 通信网与专用通信系统
4. 微波与探测技术
5. 信息与系统集成及应用

III. Research Directions

1. Multi-dimensional signal processing
2. Telemetry and remote sensing system
3. Communication network and special communication system
4. Microwave and detection technology
5. Information and system integration and Application

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:

信息与通信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 Information and Communication 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	2022LD880003	随机微分方程 Stochastic Differential Equations	2	32	春 Spring	选修 2 学分 Optional 2 credits at least
		2022LD880002	动力系统、混沌与分形 Dynamic Systems, Chaos and Fractal	3	48	春 Spring	
	专业课程 Major Course	2022LD070101	学科前沿专题 Modern Science of the Discipline	1	16	秋 Autumn	选修 2 学分 Optional 2 credits at least
		2022LD070102	现代数字信号处理 Modern Digital Signal Processing	2	32	秋 Autumn	
		2022LD070105	高级机器学习 Advanced Machine Learning	2	32	秋 Autumn	
		2022LD070115	图像处理 Image Processing	2	32	秋 Autumn	
		2022LD070111	移动通信原理 Principles of Mobile Communication	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	选修 2 学分 Optional 2 credits at least	
	2022LD070113	数值计算程序设计 Numerical Computing Programming Design	2	32	春 Spring		
	2022LD070116	模式识别新技术 New technology for pattern recognition	2	32	秋 Autumn		
	2022LD070114	计算机视觉 Computer Vision	2	32	秋 Autumn		
	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 Computer and Information. 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. 方保镕. 矩阵论[M].第二版.北京:清华大学出版社,2004.
2. 李庆扬. 数值分析[M].第五版.北京:清华大学出版社,2008.
3. 姚天任. 现代数字信号处理[M].第二版.湖北:华中科技大学出版社,2018.
4. (美) John G.Proakis (普罗科斯). 数字通信[M].第五版.北京:电子工业出版社,2009.
5. 周炯槃. 通信网理论[M].修订版.北京:人民邮电出版社,2009.
6. 杨莘元. 现代天线技术[M].第一版.北京:北京理工大学出版社,2009.
7. 王鑫. 视频图像处理[M].第一版.北京:科学出版社,2020.
8. 王汝言. 多媒体通信技术[M].第一版.西安:西安电子科技大学出版,2004.
9. (美)理查兹(Riards,M.A.). 雷达信号处理[M].第一版.北京:电子工业出版社,2008.
10. 符意德. 嵌入式系统[M].第二版.北京:清华大学出版社,2013.
11. 刘传清. 传感网技术[M].第二版.北京:电子工业出版社,2018.
12. 唐国纯. 云计算技术[M].第二版.北京:清华大学出版社,2015.
13. (美)威德罗(Winrow,B.). 自适应信号处理[M].第一版.北京:机械工业出版社,2008.
14. 樊昌信. 通信原理[M].第七版.北京:国防工业出版社,2014.
15. 周炯槃. 通信原理[M].第一版.北京:北京邮电大学出版社,2005.
16. 张力. 通信之美[M].第一版.北京:电子工业出版社,2016.
17. David Tse. Fundamentals of Wireless Communication[M].第一版.Cambridge:Cambridge University Press,2005.
18. Robert G.Gallager. Principles of Digital Communication[M].第一版.Cambridge: Cambridge University Press,2008.
19. Proakis. Digital Communication[M].第一版.Europe:McGraw-Hill Education,2008.

20. Amos Lapidoth. A Foundation in Digital Communication[M]. 第一版 .Cambridge: Cambridge University Press,2017.
21. Simon Haykin. Communication Systems[M].第 5 版. America:John-wiley, 2009.
22. 期刊：中国科学：信息科学
23. 期刊：通信学报
24. 期刊：电子与信息学报
25. 期刊：电子学报
26. 期刊：计算机学报
27. 期刊：自动化学报
28. 期刊：中国航空学报（英文版）
29. 期刊：信息安全学报
30. 期刊：中国图像图形学报
31. 期刊：电信科学
32. 期刊：IEEE Communications Surveys and Tutorials
33. 期刊：IEEE Wireless Communications
34. 期刊：IEEE Network
35. 期刊：IEEE Internet of Things Journal
36. 期刊：Proceedings of the IEEE
37. 期刊：IEEE Transactions on Mobile Computing
38. 期刊：IEEE Transactions on Multimedia
39. 期刊：IEEE Transactions on Information Theory
40. 期刊：IEEE Transactions on Wireless Communications
41. 期刊：IEEE Transactions on Communications
42. 期刊：IEEE Transactions on Signal Processing

43. 期刊: IEEE Transactions on Industrial Informatics
44. 期刊: IEEE Transactions on Medical Imaging
45. 期刊: IEEE Transactions on Vehicular Technology
46. 期刊: IEEE Communications Magazine
47. 期刊: IEEE Wireless Communications Magazine
48. 期刊: IEEE Vehicular Technology Magazine
49. 期刊: IEEE Signal Processing Magazine
50. 期刊: IEEE Journal of Selected Areas in Communications
51. 期刊: IEEE Transactions on Neural Systems and Rehabilitation Engineering
52. 期刊: IEEE-ACM Transactions on Networking
53. 期刊: IEEE Transactions on Geoscience and Remote Sensing
54. 期刊: ISPRS Journal of Photogrammetry and Remote Sensing
55. 期刊: IEEE Geoscience and Remote Sensing Magazine
56. 期刊: IEEE Transactions on Cloud Computing
57. 期刊: IEEE-ACM Transactions on Audio Speech and Language Processing
58. 期刊: IEEE Transactions on Ultrasonics Ferroelectrics and Frequency Control
59. 期刊: IEEE Transactions on Microwave Theory and Techniques
60. 期刊: IEEE Transactions on Antennas and Propagation
61. 期刊: IEEE Transactions on Aerospace and Electronic Systems
62. 期刊: IEEE Transactions on Dependable and Secure Computing
63. 期刊: IEEE Systems Journal
64. 期刊: IEEE Journal of Selected Topics in Signal Processing
65. 期刊: Ultrasound in Obstetrics & Gynecology
66. 期刊: EURASIP Journal on Audio Speech and Music Processing

67. 期刊: Signal Processing
68. 期刊: IEEE Transactions on Services Computing
69. 期刊: Ad Hoc Networks