

**河南理工大学利莫瑞克国际学院
硕士研究生专业培养方案**

**Limerick International College at
Henan Polytechnic University
Cultivation Program for Postgraduates**

通信与信息系统专业研究生人才培养方案

Cultivation Program for Postgraduates of Communication and Information System

专业代码：081001 所属学科门类：工学（08）

一、学科简介

通信与信息系统学科是信息科学中近十几年来发展最为迅速的学科之一，本学科以现代通信理论和计算机技术为基础，主要研究以信息获取、信息传输与交换、信息网络、信息处理及信息控制为主体的各类通信与信息系统，同时也是设计开发信息与通信设备及系统的应用科学。本学科与电子科学与技术、计算机科学与技术、控制理论与技术、航空航天科学与技术以及兵器科学与技术等学科相互交叉、相互渗透。它涵盖了数字通信、移动通信、卫星通信、光纤通信、水声通信、广播电视、多媒体信息处理、图像处理与计算机视觉、语音处理与计算机听觉、多维信号处理、检测与估值、导航、遥测、信息安全与对抗、物联网等众多高新技术领域。

本专业通过引进爱尔兰利莫瑞克大学的先进办学理念和优质教育资源，教学方法和办学经验，结合河南理工大学通信与信息系统学科专业优势，通过双方教师联合授课、双语教学的方法，共建利莫瑞克国际学院通信与信息系统学科硕士研究生专业。河南理工大学通信工程专业始于 2001 年，是省内较早开办通信专业教育的高校之一，2005 年获得通信与信息系统硕士学位授予权，专业所属的信息与通信工程学科是河南省一级重点学科。结合利莫瑞克大学优势学科，在现代通信技术、智能信号处理与系统、光电信号检测技术等方向形成优势和特色。培养具有坚实自然科学基础和深厚的工程技术知识、宽广的国际化视野、较强的创新思维和实践能力，能在通信与信息系统领域独立从事科学研究或胜任工程技术相关工作的国际化创新人才。

I. Introduction

Communication and Information System discipline is one of the most rapidly

developing disciplines in information science in recent ten years. Based on modern communication theory and computer technology, this discipline mainly studies various communication and information systems for information acquisition, information transmission and exchange, information network, information processing and information control as the main body; it is an applied science that designs and develops information and communication equipment and systems. This discipline is interdisciplinary with electronic science and technology, computer science and technology, control theory and technology, aerospace science and technology and weapons science and technology. It covers digital communication, mobile communication, satellite communication, optical fiber communication, underwater acoustic communication, radio and television, multimedia information processing, image processing and computer vision, voice processing and computer hearing, multidimensional signal processing, detection and evaluation, navigation, telemetry, information security and countermeasures, internet of things and many other high-tech fields.

The Postgraduate of Communication and Information System at LICHPU is constructed by introducing the advanced ideas, high-quality educational resources, teaching methods and educational experience of running school from UL, Ireland, and jointly with exploiting the major advantage at HPU. Through the teachers' joint teaching, bilingual teaching, establish the Postgraduate of Communication and Information System jointly at LICHPU. Communication engineering discipline in HPU started in 2001, which is one of the earliest universities in the province to provide communication professional education. In 2005, it was awarded the authorization of master's degree of communication and information system. Combined with the advantages of HPU, it has developed advantages and special characteristics in modern communication technology, intelligent signal processing and system, photoelectric signal detection technology and other directions.

二、培养目标

坚持社会主义办学方向，立德树人，努力培养具有健全人格、良好职业道德和良好学术素养，具有一定独立从事科学研究工作能力的高素质创新人才，通过中外双方联合培养，达到如下培养目标：（1）服从国家需要，立志为社会主义现代化建设事业服务，能适应社会、经济和科学技术发展。（2）具有实事

求是、勇于钻研、严谨诚信的科学精神，在通信与信息系统领域掌握坚实宽广的基础理论、了解信息与通信工程学科发展的前沿和动态，具备系统深入的专业知识和必要的实验技能。（3）掌握坚实的通信与信息系统理论知识与专业知识，具备先进通信工程技术应用技能，具有从事通信与信息系统、设备或装置的开发设计、工艺设计和实施等能力。（4）具有从事科学研究工作或独立承担专门工程技术工作的能力，能够独立解决本学科有关工程应用中出现的实际问题。（5）具备娴熟的英语听说读写能力及全球化国际视野，能熟练地阅读专业文献资料，具备进行国际学术交流的能力。（6）了解国际信息与通信产业规则，具有较强的团队合作精神和跨文化交流能力，能够综合运用本专业的基础理论和实践知识，在信息与通信工程领域的国际化组织机构进行理论研究或从事高端业务实践工作。

II. Cultivation objectives

Sino-foreign cooperative education adhere to the socialist direction of running schools, cultivate talents with moral integrity, and strive to cultivate high-quality innovative talents with sound personality, good professional ethics and academic quality, as well as the ability to engage in scientific research independently. Through the joint training of Chinese and foreign parties, the specific training objectives are as follows: (1) To obey the needs of the state, to serve the cause of socialist modernization, and to adapt to the development of society, economy, science and technology. (2) Have the scientific spirit of seeking truth from facts, daring to study, rigorous and honest, master solid and broad basic theories in the field of communication and information system, understand the frontier and dynamic development of information and communication engineering discipline, and have systematic and in-depth professional knowledge and necessary experimental skills. (3) Master solid theoretical basic knowledge and professional knowledge of communication and information system, have advanced communication engineering technology application skills, and have the ability to engage in the development and design, process design and implementation of communication and information system, equipment or device. (4) Have the ability to engage in scientific research work or independently undertake specialized engineering and technical work, and be able to solve practical problems in engineering application of the discipline independently. (5) Have good English listening, speaking, reading and writing skills, a global and

international perspective, read professional literature and materials skillfully, and have the ability to conduct international academic exchanges. (6) Familiar with international information and communication industry rules, with strong team spirit and cross-cultural communication skills, able to comprehensively use the basic theory and practical knowledge of the major to conduct theoretical research or engage in high-end business practice in international organizations in the field of information and communication engineering.

三、主要研究方向

1. 现代通信技术

以数字通信为基础，主要开展无线通信、物联网、计算电磁学等方面的研究，侧重于矿山通信、矿山物联网、电磁物探计算技术、MIMO 通信技术等方面的研究，以及矿井安全监控与应急通信系统、矿井人员定位及设备远程监控系统、三维介质电磁成像系统等设计与开发。

2. 智能信号处理与系统

以现代信号处理为基础，主要开展信号获取与处理、计算机测控系统、提高通信与信息系统性能的智能处理技术等研究，侧重于传感器与测试系统、电子设备与信息系统、矿井安全生产监测与控制系统等设计、开发和应用。

3. 光电信号检测技术

以信号检测为基础，主要开展新型光电传感器、光电系统集成、光信息处理等方面的研究，侧重于新型传感器的设计与制备、新型光电传感材料的性能优化和光电传感系统的设计与应用。

III. Main Research Areas

1. Modern Communication Technology

Based on digital communication, it mainly carries out research on wireless communication, internet of things, computational electro-magnetics; focusing on mining communication, mining internet of things, electromagnetic geophysical calculation technology, MIMO communication technology and other aspects, as well as the design and development of mining safety monitoring and emergency communication system, mining personnel positioning and equipment remote monitoring system, three-dimensional medium electromagnetic imaging system, etc.

2. Intelligent Signal Processing and System

Based on modern signal processing, intelligent signal processing and system mainly carries out the research on signal acquisition and processing, computer measurement and control system, intelligent processing technology to improve the performance of communication and information system, focusing on the design, development and application of sensors and testing system, electronic equipment and information system, mining safety production monitoring and control system.

3. Photoelectric Signal Measuring Technology

On the basis of signal measuring, the research on new photoelectric sensor, photoelectric system integration and optical information processing is mainly carried out; focusing on the design and preparation of new sensor, performance optimization of new photoelectric sensor material and design and application of photoelectric sensor system.

四、学制及学习年限

学制为 3 年，学习年限最多延长一年。

VI. Length

The program duration is 3 years; it can maximally be extended 1 additional year.

五、课程设置、必修环节及学分要求

课程包括必修课（公共必修课、专业必修课）、选修课和补修课三个部分，在规定的学习期限内所修总学分 30 学分（含必修环节）。跨专业或以同等学力考取的硕士研究生，应补修本专业本科主干课程不少于 2 门，补修课程由导师确定，并在课程计划中列出。所有课程学习一般应在入学后一年内完成。

必修环节 4 学分，主要包括开题报告、学术活动以及科学道德与学术规范三部分。课程设置、必修环节及时、学分的分配见下表。

V. Courses, Compulsory Part and Credits Requirements

The program includes degree courses (public degree courses, basic theory courses, professional degree courses) and optional courses. The total credits of 28 credits (including compulsory courses) are taken within the specified learning period. Postgraduate students who are interdisciplinary or have the same educational level should take at least two major undergraduate supplementary courses. The supplementary courses should be determined by the supervisor and listed in the

course plan. All courses should be completed within one year after admission. Four compulsory credits are required. See the table below for the specific distribution of curriculum, compulsory courses, teaching hours and credits.

课程设置、必修环节及学时、学分分配表

List of Courses, Compulsory Part, Class Hours and Credits

课程类别 Category	课程编号 Course NO.	课程名称 Course Title	课程来源 Course Source	教师来源 Teacher Source	学时 Hrs	学分 Crs	开课学期 Semester	备注 Remarks	
必修课 Required	公共必修 Public Required	M1161001	★综合英语 Comprehensive English	引进课程	外方	36	2	1	通识课程 General Course
		M1161002	★学术英语 Academic English	引进课程	外方	54	3	2	通识课程 General Course
		M1121001	中国特色社会主义理论与 与实践研究 Research on Theory and Practice of Socialism with Chinese Characteristics	中方	中方	36	2	1	通识课程 General Course
		M1121002	自然辩证法 Dialectics of Nature	中方	中方	18	1	2	通识课程 General Course
		M1111005	随机过程 Random Process	中方	中方	50	2	1	专业核心课程 Specialized Core Course
	专业必修 Specialized Required	M2411001	★应用云计算 Applied Cloud Computing	引进课程	外方	36	2	1	专业核心课程 Specialized Core Course
		M2411002	★信息理论与编码 Information Theory & Coding	引进课程	外方	36	2	1	专业核心课程 Specialized Core Course
		M2411003	★机器学习与数据工程 导论 Introduction to Machine Learning and Data Engineering	引进课程	外方	36	2	1	专业核心课程 Specialized Core Course
		M2411004	★物联网与边缘计算 Edge Computing and Internet of Things	引进课程	外方	36	2	1	专业核心课程 Specialized Core Course
		M2411005	★边缘深度学习 Deep Learning at the Edge	引进课程	外方	36	2	1	专业核心课程 Specialized Core Course
选修课 Optional	M2411006	★实时系统 Real-Time Systems	引进课程	外方	36	2	2	专业课程 Specialized Course	

	M2411009	★基于 Web 的应用程序 设计 Web-Based Application Design	引进课程	外方	36	2	2	专业课程 Specialized Course
	M2411105	★多媒体通信 Multimedia Communications	引进课程	外方	36	2	2	专业课程 Specialized Course
	M2411008	电磁场数值计算方法 Numerical Calculation Method of Electromagnetic Field	中方	中方	36	2	2	专业课程 Specialized Course
	M2411101	无线通信 Wireless Communication	中方	中方	36	2	2	专业课程 Specialized Course
	M2411102	空时编码技术 Space-Time Code Technology	中方	中方	36	2	2	专业课程 Specialized Course
	M2411202	数字图像处理 Digital Image Processing	中方	中方	36	2	2	专业课程 Specialized Course
	M2411203	模式识别与人工智能 Pattern Recognition and Artificial Intelligence	中方	中方	36	2	2	专业课程 Specialized Course
	M2411204	DSP 原理及应用 Principle and Application of DSP	中方	中方	36	2	2	专业课程 Specialized Course
	M2411302	信号检测与估计 Signal Measuring and Estimation	中方	中方	36	2	2	专业课程 Specialized Course
Supplementary 补修课	M2411010	数字信号处理 Digital Signal Processing	中方	中方	36	0	2	专业课程 Specialized Course
	M2411011	通信原理 Communication Principle	中方	中方	36	0	2	专业课程 Specialized Course
必修环节 Required	MBXHJ01	开题报告 Research Thesis Proposal	中方	\	\	1	3	----
	M001004	中期考核 Mid-term examination	中方	\	\	0	4	----
	MBXHJ02	学术活动 Academic Activities	中方	\	\	2	1-6	----
	MBXHJ03	科学道德与学术规范 Science Ethics and Academic Code of Conduct	中方	\	\	1	1-6	----

注：1. 根据研究生基础和专业方向，选修课不少于 3 门。

2. 列表中加星号★为外方引进课程，共 10 门。

Note: 1. According to the basic and major research approaches, there should be no less than 3 optional courses.

2. There are 10 introduced courses in total with ★in the list.

六、论文环节

研究生在完成课程学习任务,满足课程学分要求后,进入论文研究阶段,论文需用英文撰写。

1. 开题报告

开题是硕士研究生学位论文工作的重要环节。硕士研究生需要根据所选定的研究方向和学位论文水平要求，系统地查阅国内外文献（一般不少于 80 篇，其中外文文献一般不少于 30 篇），在对本学科专业研究方向的国内外发展动态有较全面的了解后，撰写不少于 5000 字的开题报告。

硕士研究生在入学后第 3 学期开题。开题报告会由学院负责，按学科或研究方向组成 3-5 人的开题报告专家小组，专家为本学科或相近学科的高级职称人员或研究生导师。开题通过者，获得 1 个学分。开题未通过者，可在三个月内再进行一次，第二次仍不合格者，终止培养。

2. 中期考核

中期考核包括思想品德、课程学习、选题开题三个方面。硕士研究生中期考核工作于第 4 学期进行，由学院统一组织，由相近学科 3-5 位专家组成考核组，考核组专家根据硕士研究生汇报情况逐个进行评议。并按优秀、合格、不合格，给出综合考核成绩。考核合格及以上者，进入学位论文下一阶段工作；不合格者，终止培养。

3. 学术活动

研究生学习期间须参加各种学术活动，并填写学术活动记录表，记录学术活动内容和收获。

学术学位硕士研究生要求至少公开做学术报告 1 次，或参加国内外学术会议 1 次。学术报告考核通过计 2 学分。

VI. Thesis

Graduate students may advance to dissertation section after completion of taught courses studies and satisfied the required credits, the dissertation should be written in English.

1. Research proposal

Research proposal is an important part of master's degree thesis work. According to the selected research direction and degree thesis level requirements, postgraduate students should systematically review the domestic and foreign literature (generally no less than 80 articles, among which the foreign language literature is not less than 30). After having a comprehensive understanding of the domestic and foreign development trends of the professional research direction of the discipline, they should write a research proposal of no less than 5000 words.

Postgraduate students will start the project in the third semester after admission. The research proposal will be supervised and monitored by the College; a 3-5 person expert group will be formed according to the discipline or research direction. The experts are senior professional title personnel or master student supervisors of the discipline or similar disciplines. One credit will be given to those who pass the research proposal. Those who fail to pass the proposal can submit a proposal again within three months, and those who fail the second time, their studies will be terminated.

2. Mid-term evaluation and assessment

The mid-term evaluation and assessment includes ideological and moral education, course learning and topic selection. The mid-term assessment of postgraduates is carried out in the fourth semester, which is organized by the College. The assessment group is composed of 3-5 experts from similar disciplines. The experts in the assessment group make comments to individual students according to the master student's report. Against the evaluation criteria of excellent, qualified and unqualified, the comprehensive evaluation results are given. Those who pass the evaluation will enter the next stage of dissertation work; those who fail to pass the examination will be terminated.

3. Academic activities

Graduate students should participate in various academic activities and fill in the academic activity record form to record the content and harvest of academic activities.

Academic master degree students are required to make an academic report publicly at least one time or to attend an academic conference, domestic or abroad, one time. Students can obtain 2 credits if passing the academic report examination.

七、论文评审和答辩

1. 论文评审：审核论文作者掌握本领域坚实的基础理论和系统的专业知识的情况；综合运用科学理论、方法和技术手段解决工程技术问题的能力；掌握科学研究的一般方法，对通信与信息系统基础理论或工程实践中出现的问题，善于创造性思维，提出独特的见解和创新研究。

2. 评审方式：全日制学术学位研究生学位论文必须两位本领域或相关领域专家评阅，在全国范围内进行双盲制评审，两本论文均通过盲审后方可进行毕业答辩。

3. 答辩组织：答辩委员会由 3-5 位本领域或相关领域专家组成。

VII. Thesis Review and Defense

1. Thesis review: A thesis shall be reviewed for whether its author has solid fundamental theories and systematic professional knowledge in the field, be able to solve technical engineering problems using scientific theories, methods and techniques, has learned the general methods of scientific research, and be good at creative thinking when facing problems arising from fundamental theories and engineering practices of Communication and Information System to put forward unique insights and innovative studies.

2. Review process: Degree theses of full-time postgraduates of academic degrees shall be reviewed by two experts in the field or related fields, and be reviewed by the nationwide double-blind system. Students shall proceed to graduation thesis defenses only after they have their theses approved in both reviews.

3. Defense The defense committee shall be composed of three to five experts in the field or related fields.

八、毕业和学位授予

在规定年限内，学生修完本专业人才培养方案规定的学分，通过双方联合组织的研究生毕业论文答辩，德、智、体各方面达到毕业要求，准予毕业，由河南理工大学颁发研究生毕业证书。报河南理工大学学位委员会审定后，河南

理工大学颁发硕士学位证书；研究生雅思成绩达到 6.5（单科不低于 6.0）或者通过利莫瑞克大学英语语言测试，成绩合格，报利莫瑞克大学学位委员会审定后，利莫瑞克大学颁发硕士学位证书。学生在人才培养方案规定的修业年限内达不到毕业条件的，由河南理工大学颁发结业证书，利莫瑞克大学出具学习证明。

VIII. Graduation and Degree Awarded

Within the specified number of years, the student who has completed all the courses credits stipulated in the talent cultivation plan, passed the requirements of academic defense for the postgraduate thesis, which jointly organized by both parties, and met the graduation requirements in moral, intellectual and physical aspects, will be granted graduation, and awarded the postgraduate graduation certificate of HPU. After being approved by HPU's Degree Committee, student will be awarded master degree of HPU. After being approved by UL's Degree Committee, postgraduate student who has achieved IELTS score of 6.5 (no less than 6.0 for each item) or passed the English Language Test of UL, will be awarded master degree. HPU and UL shall jointly supervise the postgraduate thesis, which will be written in English. If the student fails to meet the graduation requirements within the length of the programs specified in the talent cultivation plan, HPU shall issue the completion certificate and UL shall issue study certificate.