河南理工大学利莫瑞克国际学院

本科专业培养方案

Henan Polytechnic University
Limerick International College
Cultivation Program for Undergraduates

自动化专业本科人才培养方案

Cultivation Program for Undergraduate of Automation

专业代码：080801　　所属学科门类：工学（08）

一、专业简介

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，结合河南理工大学自动化专业优势，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自动化专业。自动化专业自 1958 年成立煤矿机电本科至今已走过 60 年，师资均衡，结构合理，实验条件优越，学科平台资源丰富。目前该专业拥有“控制科学与工程”河南省一级重点学科、“矿业控制工程”博士学位授权点，“控制科学与工程”一级学科硕士授权点，以及控制工程专业学位硕士授权领域，拥有河南省特色专业和河南省综合改革试点专业、“电气信息类自动化课程群省级教学团队”、教育部自动化专业卓越计划试点单位、“国家级资源共享课程《自动控制系统》”等。已初步形成了从学士、硕士到博士的完整人才培养体系。本专业继承工矿自动化优良传统，与时俱进，以服务地方经济和社会发展为己任。

I. Introduction

The Automation major at LIIHPU 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 Automation Major jointly at LIIHPU.Started in 1958, the automation has been established for 60 years. The teaching staff is balanced, the structure is reasonable, the experiment labs and resources are outstanding, and the subject platform resources are rich. At present, the major has the first-class key discipline of “Control science and Engineering” in Henan Province. The discipline is authorized to offer “Mining Control Engineering” doctoral degree and “control science and Engineering”. Authorized first-class discipline to offer master degree, as well as offering control engineering master degree, it has Henan Province characteristic specialty and Henan Province comprehensive reform pilot specialty major. It is also the “Electrical Information Automation Curriculum Group Provincial Teaching Team”, the Ministry of Education automation discipline excellence program pilot unit, national resource sharing course “Automatic Control

System", etc. It has formed a comprehensive talent cultivation system from bachelor degree, master degree to doctor degree. This major inherits the fine tradition of industrial and mining automation, advances as time progresses, it has been serving the local economic and social development as its own responsibility.

二、培养目标

自动化专业培养适应现代控制技术及区域经济社会发展需要，具备国际化的知识结构和视野，德智体美劳全面发展，系统掌握自动化领域的基本理论、专业知识和专业技能，良好的工程和人文素养、团队合作精神、创新意识和自主学习能力，能在工矿企业、科研院所等部门从事自动化系统的研究与开发、自动化系统集成、智能检测与装备、运行管理与决策等工作的宽口径、高素质应用型国际化工程科技人才。

II.Cultivation Objectives

The automation major aims to cultivate talents who meet the needs of modern control technology and regional economic and social development, have international knowledge structure and vision, develop morally, intellectually, physically, aesthetically and artistically, and systematically master basic theories, professional knowledge and skills in the field of automation.Automation is designed to develop wide caliber, the high quality applied international engineering science and technology talent, they have good engineering and humanities cultivated manners, the team cooperation spirit, innovation consciousness and autonomous learning ability, and can in industrial and mining enterprises, scientific research institutes and other departments engaged in research and development of the automation system, automation system integration, intelligent detection and equipment, operation management and decision-making, etc.

三、毕业要求

1.具有从事自动化工程所需的数学、自然科学知识，掌握电子电路、信号与系统等工程基础理论，具有控制理论、控制工程、检测技术、电力电子等专业基础知识，并能够综合应用这些知识解决自动化领域复杂工程问题。

2.能够在信息收集、文献调研的基础上，应用自动化专业相关的数学、自然科学和工程科学的基本原理，对自动化工程领域的复杂工程问题进行建模与分析，掌握对象特性，获得对自动化领域复杂工程问题的深刻认识并得出有效结论。

3.能够基于科学原理，通过文献调研，采用自动化学科知识和技术手段对复杂工程

问题进行建模、仿真、优化和综合，能够合理设计与安全开展实验，对实验结果进行分析与解释，并通过信息综合得到合理有效的结论。

4.熟悉自动化相关产业政策、行业标准与法律法规，能够基于工程相关背景知识合理分析，评价自动化领域工程实践和复杂工程解决方案对社会、健康、安全、法律以及文化的影响，并理解可能产生的后果及应承担的责任。

5.具备一定的国际视野，了解自动化领域的国际发展趋势，研究热点，能够在跨文化背景下能运用英文就专业问题熟练沟通和交流。具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

III. Graduation Requirements

1. To possess the knowledge of mathematics and natural science required for automation engineering, master the basic engineering theory of electronic circuit, signal and system. To have the professional basic knowledge of control theory, control engineering, detection technology, power electronics, etc., and be able to comprehensively apply these knowledge to solve complex engineering problems in automation field.

2. To be able to apply the basic principles of mathematics, natural science and engineering science related to automation specialty to model and analyze the complex engineering problems in the field of automation engineering, master the characteristics of the object, obtain a deep understanding of the complex engineering problems in automation field and draw effective conclusions on the basis of information collection and literature research.

3. To be able to use automation discipline knowledge and technical means to model, simulate, optimize and synthesize complex engineering problems, based on scientific principles, through literature research. To be able to design and carry out experiments safely, analyze and explain the experimental results, and obtain reasonable and effective conclusions through information synthesis.

4. Be familiar with automation related industrial policies, industry standards, laws and regulations. Based on engineering related background knowledge, to be able to reasonably analyze and evaluate the impact of engineering practice and complex engineering solutions in automation field on society, health, safety, law and culture, and understand possible consequences and responsibilities to take.

5. To understand the international development trends and research hotpots in the field of automation with international perspective, be able to conduct basic communication and exchange on professional issues in English under the cross-cultural background. To have the

consciousness of self-learning and lifelong learning, and have the ability of continuous learning and adapting to development.

四、主干学科与交叉学科、专业核心课程、课程平台及学分比例

IV. Main and Cross Disciplines, and Major Core Courses, Course Platforms and Credit Proportion

1．主干学科与交叉学科

主干学科：控制科学与工程，控制工程；矿业控制工程；矿业电气与控制工程；交叉学科：计算机科学与技术；计算机技术；通信与信息系统

1. Main and Cross Disciplines

Main discipline: Control Science and Engineering, Control Engineering; Mining Control Engineering; Mining Electrical and Control Engineering; Interdisciplinary: Computer Science and Technology; Computer Technology; Communication and Information System

2．专业核心课程

运动控制系统(国家级精品开放课程)、检测技术与自动化仪表，实时嵌入式系统、控制理论 1、控制理论 2、数子控制技术、机器学习与数据挖掘、过程控制系统、计算机集成控制系统

2. Major Core Courses

Motion Control System (national excellent open course), Testing Technology and Automation Instrument, Seminar (seminar type), Automatic Control Principle, Modern Control Theory, Process Control System, Modern Electrical Control and PLC, Computer Integrated Control System

3．课程平台及学分比例

3.Course Platforms and Credit Proportion

课程平台 Course Category	**课程模块 Course Module**	**课程性质 Nature of Course**	**修读学分要求 Credits Required**	**占总学分比例 Proportion of the Total Credits**	**备注 Remarks**
通识课程平台 General Course Platform	公共基础课程模块 Public Basic Course Module	必修 Required	65	45.8%	两个平台课程学分相加即为总分。The total credits are equal to the sum of the credits of the two platforms.
	素质拓展理论课程 Ability Expansion Theory Course	/	11.5		
	素质拓展实践创新 Alibity Expansion Practical Course	选修 Optional	5		
专业课程平台 Major Courses	专业理论必修课程 Required Major Theory Course	必修 Required	64	54.2%	

Platform	专业理论选修课程 Optional Major Theory Course	选修 Optional	2.5		
	专业实践课程模块 Major Experiment Course	必修 Required	30		
合计 Total			178	/	
实践教学环节 Practical Teaching	主要实践教学环节 Main Practical Education	必修 Required	26	28.7%	
	独立设置的实验课程 Independent Experiment Course	必修 Required	2		
	专业实践创新模块 Major Practice and Innovation Course	必修 Required	2		
	课内实验 In-class Experiment	/	16		
	素质拓展实践创新 Quality Development Practice Innovation Course	选修 Optional	5		
合计 Total			51	/	

五、修业年限、毕业学分要求与授予学位

1. 修业年限：基本学制 4 年，弹性学习年限 3-6 年

2. 毕业学分要求：总学分 178 学分

3. 授予学位：工学学士

4. 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本科生毕业设计答辩，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本科毕业证书。报河南理工大学学位委员会审定后，河南理工大学颁发学士学位证书；雅思成绩达到 6.0（单科不低于 6.0）或者参加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，利莫瑞克大学颁发学士学位证书。本科生毕业设计用英文撰写，由双方联合指导。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。

V. Length of schooling, graduation credits requirement and degree awarded

1. Length of Schooling: 4 years full time; with the flexibility of completion within 3-6 years

2. Graduation Credits Requirement: 178 credits

3. Degree Awarded: Bachelor of Engineering

4. 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 undergraduate graduation design, which jointly organized by both universities, and met the graduation requirements in moral, intellectual and physical aspects, will be granted

graduation, and awarded the undergraduate graduation certificate of HPU. After being approved by HPU's Degree Committee, student will be awarded bachelor degree of HPU.After being approved by UL's Degree Committee, undergraduate student who has achieved an IELTS score of 6.0 (no less than 5.5 for each item) or pass the English Language Test of UL, will be awarded bachelor degree. HPU and UL shall jointly supervise the undergraduate graduation design, 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.

六、就业（发展）方向

学生毕业后，可在跨国公司、外资或合资企业、国内外科研院所从事有关运动控制、过程控制、自动化仪表和设备、机器人控制、智能监控方面的工程设计与技术开发、系统运行管理与维护，以及管理、决策、教学及科研等方面的工作。

VI. Employment (Development) Direction

After graduation, students can be engaged in engineering design and technology development, system operation management and maintenance, management, decision making, teaching and scientific research of motion control, process control, automatic instruments and equipment, robot control and intelligent monitoring inmultinational corporations, foreign-funded or joint ventures, domestic and foreign scientific research institutes.

七、自动化专业指导性教学进程表

VII. Guiding Teaching Schedule for Automation

自动化专业指导性教学进程表
Guiding Teaching Schedule for Automation

建议修读时间 Semester	课程编号 Course NO.	课程名称 Course Name	课程性质 Course Nature	学分 Crs	学时 Hrs	学时分配 Hrs Allotment			课程类别 Course Type	备注 Remarks
						课堂 Teaching	实验 Exp.	线上 Online		
第一学期 Semester 1	520000030	军事理论 Military Theory	必修 Required	2	32	16		16	通识课程 General	
	110000680	高等数学 b-1Higher Mathematics b-I		5	80	80			通识课程 General	
	140001290	★基础英语 Foundation English		4	64	64			通识课程 General	引进课程 Introduced
	080000800	机械工程制图与 CAD Mechanical drawing and CAD		2	32	24	8		通识课程 General	
	150000170	体育与健康 1 PE and Health I		1	16	14		2	通识课程 General	
	110000320	线性代数 b Linear Algebra b		2.5	40	40			通识课程 General	
	120000010	思想道德与法治 Morals, Ethics and Fundamentals of Law		3	48	48			通识课程 General	
	120000171	形势与政策 1 Situation and Policy I		1	16	10		6	通识课程 General	
	520000011	军事技能训练（军训）Military Training		2					实践教学 Practice	
	181000051	大学生心理健康教育 Psychological Health Education for College Students	选修 Optional	2	32	24	8		通识课程 General	
	171000061	书法鉴赏 Chinese Calligraphy Appreciation	选修(二选一) Optional	1	16	16			通识课程 General	
	171000081	美学概论 Introduction to Aesthetics		1	16	16			通识课程 General	
	合计 Total			25.5	376	336	16	24		
第二学期 Semester 2	110000460	高等数学 b-2Higher Mathematics b-II	必修 Required	4	64	64			通识课程 General	
	110000340	复变函数与积分变换 Complex Analysis and Integral Transform		3	48	48			通识课程 General	
	140001300	★综合英语 Comprehensive English		4	64	64			通识课程 General	引进课程 Introduced
	130000510	大学物理（一）College PhysicsI		3	48	48			通识课程 General	
	130000511	物理实验（一）General PhysicsExperimentationI		1	24		24		实践教学 Practice	
	080000130	★电路理论 1Circuit Theory1		4	64	52	12		专业核心课程 Specialized	引进课程 Introduced
	500000230	高级语言程序设计 b C language Programming b		3	48	36	12		通识课程 General	
	150000180	体育与健康 2 PE and Health II		1	16	10		4	通识课程 General	
	120000231	形势与政策-1 Situation and Policy- I		0	8	3		5	通识课程 General	
	081020191	★工程导论 Introduction to Engineering		1	16	16			专业核心课程 Specialized	引进课程 Introduced
	191010061	大学生心理与健康	选修(二选一) Optional	1	16	16			通识课程 General	
	60113360M	电路史诗 Circuit Epic		1	16			16	通识课程 General	
	合计 Total			25	416	357	48	9		

自动化专业指导性教学进程表(续)
Guiding Teaching Schedule for Automation (Continued)

建议修读时间 Semester	课程编号 Course NO.	课程名称 Course Name	课程性质 Course Nature	学分 Crs	学时 Hrs	学时分配 Hrs Allotment			课程类别 Course Type	备注 Remarks
						讲授 Teaching	实验 Exp.	讲授 Teaching		
第三学期 Semester 3	140001310	★学术英语 1 Academic English -I	必修 Required	4	64	64			通识课程 General	引进课程 Introduced
	130000520	大学物理（二）College PhysicsII		3	48	48			通识课程 General	
	130000521	物理实验（二）General PhysicsExperimentationII		1	24		24		实践教学 Practice	
	080000140	电路理论 2 Circuit Theory 2		2.5	40	32	8		专业核心课程 Specialized	
	080000150	★模拟电子技术 Analog Electronics Technology		4	64	48	16		专业核心课程 Specialized	引进课程 Introduced
	110000640	概率论与数理统计 Probability Theory and Mathematical Statistics		3.5	48	48			通识课程 General	
	080000010	★信号与系统 Signals and Systems		4	64	56	8		专业核心课程 Specialized	引进课程 Introduced
	150000190	体育与健康 3 PE and Health III		1	16	14		2	通识课程 General	
	120000020	中国近现代史纲要 Outline of Contemporary and Modern Chinese History		2	32	32			通识课程 General	
	120000121	形势与政策-2 Situation and Policy- II		0	8	3		5	通识课程 General	
	530000141	工程基础实训与实践 Basic Training and Practice of Engineering		2					实践教学 Practice	
	60103375M	创新方法与实践 Innovative Methods and Practices	选修(二选一) Optional	2	32			32	通识课程 General	
	60103372M	单片机原理与应用实例仿真 Principle of Single Chip Microcomputer and Application Case Simulation		2	32			32	通识课程 General	
	合计 Total			29	440	345	56	39		
第四学期 Semester 4	140001320	★学术英语 2 Academic English -II	必修 Required	4	64	64			通识课程 General	引进课程 Introduced
	080000170	★数字电子技术 Digital Electronics Technology		3.5	56	44	12		专业核心课程 Specialized	引进课程 Introduced
	080000181	电子技术课程设计 Electronic Technology Course Design		1					实践教学 Practice	
	150000200	体育与健康 4 PE and Health IV		1	34	32		2	通识课程 General	
	080020110	★电机与电力拖动 Motor and Power Traction		3	48	44	4		专业核心课程 Specialized	引进课程 Introduced
	080020080	★电力电子技术 Power Electronics		3	48	40	8		专业核心课程 Specialized	引进课程 Introduced
	080020020	★控制理论 1 Control theory1		4.5	72	64	8		专业核心课程 Specialized	引进课程 Introduced
	120000030	马克思主义基本原理概论 Introduction to the Basic Principles of Marxism		4	64	64			通识课程 General	
	120000251	形势与政策-3Situation and Policy- III		0	8	3		5	通识课程 General	
	120000011	思想政治理论课实践教学 Practice Practice of Ideology Political Theory Course		2					通识课程 General	
	530000181	电工电子技术训练 Electrical and Electronic Technology Training		1					实践教学 Practice	
	151000021	陈式太极拳文化赏析 Chen Style Taijiquan Appreciation	选修 Optional	1	16	16			通识课程 General	
	合计 Total			28	410	371	32	7		

自动化专业指导性教学进程表(续)
Guiding Teaching Schedule for Automation (Continued)

建议修读时间 Semester	课程编号 Course NO.	课程名称 Course Name	课程性质 Course Nature	学分 Crs	学时 Hrs	学时分配 Hrs Allotment			课程类别 Course Type	备注 Remarks
						讲授 Teaching	实验 Exp.	讲授 Teaching		
第五学期 Semester 5	080020064	嵌入式系统工程实训 Embedded system Engineering Practice	必修 Required	1					实践教学 Practice	
	080020040	★控制理论 2 Controltheory 2		4	64	56	8		专业核心课程 Specialized	引进课程 Introduced
	080020050	运动控制系统 Motion Control System		3	48	40	8		专业核心课程 Specialized	
	120000210	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics		4	64	64			通识课程 General	
	120000261	形势与政策-4 Situation and Policy-IV		0	8	3		5	通识课程 General	
	080020030	★检测技术与自动化仪表 Detection Technology and Automation Instrumentation		3	48	40	8		专业核心课程 Specialized	引进课程 Introduced
	080020011	认识实习 Cognition Practice		1					实践教学 Practice	
	080020021	自动化专业综合课程设计 I Integrated curriculum design for automation I		1					实践教学 Practice	
	081020021	★Python 语言与模式识别 Pythonlanguageand Pattern recognition		2	32	28	4		专业核心课程 Specialized	引进课程 Introduced
	081020030	★实时嵌入式系统 Real-TimeEmbedded System		3	48	40	8		专业核心课程 Specialized	引进课程 Introduced
	081020050	现代电气控制技术与 PLC Modern electrical control technology and PLC		2	32	24	8		专业核心课程 Specialized	
	081020150	MATLAB 工程应用 MATLAB Engineering Application	选修 Optional	2	32		32		通识课程 General	
	合计 Total			26	376	295	76	5		
第六学期 Semester 6	080020031	专业实习 Professional Practice	必修 Required	2					实践教学 Practice	
	080020180	★数字控制技术 Digital Controltechnology		4	64	56	8		专业课程 Specialized	引进课程 Introduced
	120000181	形势与政策 2 Situation and Policy II		1	16	10		6	通识课程 General	
	080020060	计算机集成控制系统 Computer Integration Control System		3	48	40	8		专业核心课程 Specialized	
	080020041	自动化专业综合课程设计 II Integrated curriculum design for automation II		1					实践教学 Practice	
	080020078	★机器学习与数据挖掘 Machine Learningand Data Engineering		2	32	32	0	0	专业核心课程 Specialized	引进课程 Introduced
	080020070	过程控制系统 Process control system		3	48	40	8		专业核心课程 Specialized	
	081020060	智能控制与优化 Intelligent Control and Optimization		3	48	48			专业课程 Specialized	
	60104162Z	演讲与口才 Speech and Eloquence	选修(二选一) Optional	1.5	24			24	通识课程 General	
	60101458E	口才艺术与社交礼仪 Eloquence Art and Social Etiquette		1.5	24			24	通识课程 General	
	合计 Total			20.5	280	226	24	30		

自动化专业指导性教学进程表(续)
Guiding Teaching Schedule for Automation (Continued)

建议修读时间 Semester	课程编号 Course NO.	课程名称 Course Name	课程性质 Course Nature	学分 Crs	学时 Hrs	学时分配 Hrs Allotment			课程类别 Course Type	备注 Remarks
						讲课 Teaching	实验 Exp.	讲课 Teaching		
第七学期 Semester 7	080020160	★工程伦理与工程管理 Engineering Ethics and Engineering Management	必修 Required	1.5	24	24			专业核心课程 Specialized	引进课程 Introduced
	081020090	数字图像处理 Digital Image Processing	选修 Optional	2.5	40	36	4		专业课程 Specialized	
	081020040	新中国史 The New China	选修 Optional	1	16	0	0		通识课程 General	
	合计 Total			5	80	60	4			
第八学期 Semester 8	080020241	毕业实习 Graduation Practice	必修 Required	4					实践教学 Practice	
	080020251	毕业设计 Graduation Design		10					实践教学 Practice	
	合计 Total			14						
素质拓展实践创新 Quality Development and Practice Innovation	要求学生在毕业前至少选修取得 5 个素质拓展实践创新学分，此类学分根据学校相关文件单独考核记载并计入总学分。 Students are required to obtain at least 5 credits for ability expansion and practice innovation before graduation. Such credits are recorded separately according to relevant documents of the university and included in the total credits.									

自动化专业主要实践教学环节安排表
Practical Teaching Schedule for Automation

建议修读时间 Semester	课程编号 Course NO.	课程名称 Course Name	课程性质 Course Nature	学分 Crs	周数或学时 Week or Hrs	备注 Remarks
第 1 学期 Semester 1	520000011	军事技能训练（军训） Military Training	必修 Required	2	2 周	
第 2 学期 Semester 2	130000511	物理实验（一） General PhysicsExperimentationI	必修 Required	1	24 学时	
第 3 学期 Semester 3	130000521	物理实验（二） General Physics experimentation II	必修 Required	1	24 学时	
第 3 学期 Semester 3	530000141	工程基础实训与实践 a Basic Training and Practice of Engineering a	必修 Required	2	2 周	
第 4 学期 Semester 4	30000181	电工电子技术训练 a Electrical and Electronic Technology Training a	必修 Required	1	1 周	
第 4 学期 Semester 4	080000181	电子技术课程设计 Electronic Technology Course Design	必修 Required	1	1 周	

第 4 学期 Semester 4	120000011	思想政治理论课实践教学 Practice Practice of Ideology Political Theory Course	必修 Required	2	2 周	
第 5 学期 Semester 5	080020064	嵌入式系统工程实训 Embedded system Engineering Practice	必修 Required	1	1 周	
第 5 学期 Semester 5	080020011	认识实习 Cognition Practice	必修 Required	1	1 周	
第 5 学期 Semester 5	080020021	自动化专业综合课程设计 I Integrated curriculum design of automation I	必修 Required	1	2 周	
第 6 学期 Semester 6	080020031	专业实习 Professional Practice	必修 Required	2	2 周	
第 6 学期 Semester 6	080020041 /080020051	自动化专业综合课程设计 II/自动化专业综合课程设计 III Integrated curriculum design of automation II/ Integrated curriculum design of automation III	必修 Required	1		
第 8 学期 Semester 8	080020241	毕业实习 Graduation Practice	必修 Required	4		
第 8 学期 Semester 8	080020251	毕业设计 Graduation Design	必修 Required	10		
合计 Total				30		