

# 电子信息工程专业（中外合作项目）本科人才培养方案

## Curriculum of Bachelor Program of Electronic Information Engineering

### (Chinese-Foreign Cooperation program)

#### 一、培养目标 Training Objectives

培养能够通过终身学习来顺应国家科技和社会经济发展需要，综合应用电子信息工程以及其他信息领域的基础理论和专业知识；能够在现代电子信息工程领域中从事研究、设计、制造、运营和项目管理等工作；并能够综合考虑法律、安全、环境与可持续发展等因素；具有良好的人文素养、工程师职业道德、社会责任感和国际视野，具备工程创新意识、团队合作精神；成为服务全球电子信息行业的卓越应用型工程人才。

To train students to adapt to the needs of national science and technology and social and economic development through lifelong learning, comprehensively apply the basic theories and professional knowledge of electronic information engineering and other information fields, be able to engage in research, design, manufacturing, operation and project management in the field of modern electronic information engineering, and comprehensively consider the factors of law, security, environment and sustainable development With good humanistic quality, engineer professional ethics, sense of social responsibility and international vision, engineering innovation consciousness and team spirit, he has become an outstanding application-oriented engineering talent serving global electronic information industry.

**学生在毕业后5年左右预期能够实现以下目标：**

Students are expected to achieve the following goals about 5 years after graduation:

(1) 社会责任感：具有健全的人格、良好的修养和职业道德，社会责任感强，身心健康。

Sense of social responsibility: with sound personality, good cultivation and professional ethics, strong sense of social responsibility, physical and mental health.

(2) 发现、分析解决问题能力：具有扎实的数理基础和系统的电子信息工程专业知识，并能使二者融会贯通，能够对复杂工程问题进行研究，对复杂工程项目提供系统性的解决方案，并得到合理有效的结论。

Ability to discover, analyze and solve problems: have solid mathematical foundation and systematic professional knowledge of electronic information engineering, and be able to integrate the two, study complex engineering problems, provide systematic solutions for complex engineering projects, and get reasonable and effective conclusions.

(3) 设计研发能力：能够跟踪并适应现代电子信息技术发展，具备较强的实践和创新能力，能够运用现代工具从事本专业领域相关产品的设计、开发和生产，负责完成一个以上产品关键技术的方案设计和研发工作，成长为研发工程师、产品设计师等。

Design and R&D ability: be able to track and adapt to the development of modern electronic

information on technology, have strong practice and innovation ability, be able to use modern tools to engage in the design, development and production of related products in the professional field, be responsible for the scheme design and R&D of more than one product key technology, and grow into R&D Engineer and product designer.

(4) 团队合作与管理能力: 具有较强的组织管理能力、人文素养和团队合作能力、较宽广的国际化视野及国际交流能力, 具备在团队中分工协作、交流沟通的能力, 以及发挥领导作用的潜力;

Team cooperation and management ability: strong organization and management ability, humanistic quality and team cooperation ability, broad international vision and international communication ability, the ability of division of labor and cooperation, communication ability in the team, and the potential to play a leading role;

(5) 全球视野和终身学习能力: 具有全球化意识和国际视野, 拥有自主的、终生的学习习惯和能力, 能够通过自主学习持续提升自己的综合素质和专业能力, 不断适应社会发展。

Global vision and lifelong learning ability: with global awareness and international vision, with independent and lifelong learning habits and abilities, able to continuously improve their comprehensive quality and professional ability through autonomous learning, and constantly adapt to social development.

## 二、毕业要求 Graduation Requirements

1. **工程知识:** 能够应用数学、自然科学、工程基础和专业知识的基本原理, 将电子信息复杂工程问题抽象为数学物理模型进行描述、分析求解, 用于解决电子信息工程及其相关领域复杂工程问题。

**Engineering knowledge:** it can apply the basic principles of mathematics, natural science, engineering foundation and professional knowledge, abstract the complex engineering problems of electronic information into mathematical physical model for description, analysis and solution, and be used to solve the complex engineering problems in electronic information engineering and related fields.

1.1. **表述问题:** 能够将数学与自然科学的基本概念运用到电子信息工程领域复杂工程问题的适当表述之中;

expression: be able to apply the basic concepts of mathematics and natural science to the appropriate expression of complex engineering problems in the field of electronic information engineering;

1.2. **建立模型:** 能够应用数学、自然科学知识和工程基础知识, 针对一个电子信息工程领域的复杂系统或者过程建立一种数学模型或者原理方程;

model establishment: it can apply mathematics, natural science knowledge and engineering basic knowledge to establish a mathematical model or principle equation for a complex system or process in the field of electronic information engineering;

1.3. **问题求解:** 能够对数学模型和原理方程的正确性进行严谨的推理, 并能正确求解;

problem solving: it can make rigorous reasoning on the correctness of mathematical model and principle equation, and can solve it correctly;

- 1.4. 应用知识：能够利用工程和专业对通信工程领域复杂工程问题的解决方案进行分析，比较与综合。

application knowledge: be able to analyze, compare and synthesize solutions to complex engineering problems in communication engineering field by using engineering and professional knowledge.

2. **问题分析：**能够应用数学、自然科学和工程科学的基本原理，识别、描述和分析电子信息复杂工程问题，结合文献研究，获得对相应复杂工程问题的深刻认识并得出有效结论。

**Problem analysis:** it can apply the basic principles of mathematics, natural science and engineering science to identify, describe and analyze the complex engineering problems of electronic information, and combine with literature research to obtain a deep understanding of the corresponding complex engineering problems and draw effective conclusions.

- 2.1. 识别判断：能够运用数学、自然科学和工程科学的基本原理识别和判断复杂通信工程问题的关键环节和参数；

Identification and judgment: be able to identify and judge the key links and parameters of complex communication engineering problems by using the basic principles of mathematics, natural science and Engineering Science;

- 2.2. 方案表述：能够运用数学、自然科学和工程科学的基本原理表达电子信息相关复杂工程问题的输入条件、约束关系和输出参数，并建立数学模型；

Scheme expression: it can express the input conditions, constraints and output parameters of complex engineering problems related to electronic information by using the basic principles of mathematics, natural science and Engineering Science, and establish mathematical model;

- 2.3. 方案分析：分析实验或模拟数据，并结合纸质文献、电子文献与互联网数据等进行检索、整理、分析和归纳，利用相关工程知识和原理揭示复杂电子信息工程问题的内在规律，确定一套或多套有效的问题解决方案；

Scheme analysis: analyze experimental or simulated data, and search, sort out, analyze and summarize the paper documents, electronic documents and Internet data, reveal the internal laws of complex electronic information engineering problems by using relevant engineering knowledge and principles, and determine one or more effective solution;

- 2.4. 结果分析：能够应用数学、自然科学和工程科学的基本原理给出正确的工程问题解决方案，并评价解决方案的合理性。

Result analysis: be able to apply the basic principles of mathematics, natural science and engineering science to give the correct solution to engineering problems and evaluate the rationality of the solution.

3. **设计/开发解决方案：**能够针对电子信息复杂工程问题，综合考虑经济、社会、健康、安

全、法律、文化及环境因素，设计解决方案，在设计环节中体现创新意识，并对设计方案进行测试与改进。

**Design / development solution:** it can design solutions according to complex engineering problems of electronic information, comprehensively consider economic, social, health, safety, legal, cultural and environmental factors, and design solutions, embody innovation consciousness in design process, and test and improve the design scheme.

- 3.1. 设计方法：掌握设计/开发电子信息工程及相关领域复杂工程问题解决方案所需要的专业知识和常用方法。

Design method: master the professional knowledge and common methods required for the design / development of electronic information engineering and complex engineering problem solutions in related fields.

- 3.2. 构思方案：能针对电子信息工程及相关领域复杂工程问题，综合利用专业知识，提出解决方案。设计方案应综合考虑社会、健康、安全、法律、文化以及环境等因素的影响。

Concept scheme: it can comprehensively utilize professional knowledge and propose solutions for complex engineering problems in electronic information engineering and related fields. The design plan shall consider the influence of social, health, safety, law, culture and environment.

- 3.3 设计方案：能够根据电子信息工程及相关领域复杂工程问题的特定需求，确定设计目标并设计满足特定指标要求的系统方案。

Design scheme: it can determine the design objectives and design the system scheme meeting the requirements of specific indexes according to the specific requirements of electronic information engineering and complex engineering problems in related fields.

- 3.4 优化改进：针对已有复杂工程问题的设计方案进行研究和优化，体现创新意识。

Optimization and improvement: research and optimize the design scheme for existing complex engineering problems, and reflect the innovation consciousness.

- 4、研究：**能够基于电子信息理论和相关科学原理，对通信工程及相关领域内的复杂工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

**Research:** Based on the theory of electronic information and related scientific principles, the research on the complex engineering problems in communication engineering and related fields can be carried out, including design experiment, analysis and interpretation of data, and reasonable and effective conclusions can be obtained through information synthesis.

- 4.1 研究方法：能够理解和运用电子信息工程及相关领域科学原理，熟悉研究解决复杂工程问题的科学方法。

Research methods: be able to understand and apply the scientific principles of electronic information engineering and related fields, and be familiar with the scientific methods for research and solution to complex engineering problems.

- 4.2实验设计：能够针对复杂电子信息工程问题的背景和需求进行分析，选择合理可行的

研究路线，并设计实验方案。

**Experimental design:** it can analyze the background and demand of complex electronic information engineering problems, select reasonable and feasible research routes, and design experimental scheme.

4.3 实验构建：能够针对电子信息工程及相关领域复杂工程问题，构建实验系统，操作实验装置，科学地采集实验数据。

**Experimental construction:** it can build experimental system, operate experimental equipment and scientifically collect experimental data according to complex engineering problems in electronic information engineering and related fields.

4.4 分析归纳：能够对不同的实验方案进行分析、对比和改进，并对数据进行分析与解释，通过信息综合得到合理有效的结论。

**Analysis and induction:** it can analyze, compare and improve different experimental schemes, analyze and explain the data, and get reasonable and effective conclusions through information synthesis.

5、使用现代工具：能够针对电子信息工程及相关领域内的复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性。

**Use modern tools:** be able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools, including prediction and Simulation of complex engineering problems, and understand the limitations of complex engineering problems in the field of electronic information engineering and related fields.

5.1 工具使用：熟悉现代工程工具和信息技术工具的使用方法；

**Tool use:** familiar with the use methods of modern engineering tools and information technology tools;

5.2 模拟仿真：能针对电子信息工程及相关领域复杂工程问题，使用软硬件设计与仿真平台、技术等资源进行问题的预测与模拟；

**Simulation:** it can forecast and simulate problems with software and hardware design and simulation platform, technology and other resources for complex engineering problems in electronic information engineering and related fields;

5.3 选用开发：能够合理选择、使用、开发恰当的现代工具，并理解其局限性。

**Selection and development:** be able to reasonably select, use and develop appropriate modern tools and understand its limitations.

6、工程与社会：能够基于电子信息工程背景知识进行合理分析，评价专业工程实践和电子信息复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解工程师应承担的责任与义务。

**Engineering and society:** be able to conduct reasonable analysis based on the background Knowledge of electronic information engineering, evaluate the impact of professional engineering practice and electronic information complex engineering problem solution on

society, health, safety, law and culture, and understand the responsibilities and obligations of engineers.

- 6.1 工程实践：具有工程实习和社会实践经历，熟悉电子信息工程及相关领域相关的国家和行业标准、发展规划、产业政策，了解企业管理体系。

Engineering practice: have engineering practice and social practice experience, be familiar with national and industrial standards, development planning, industrial policies related to electronic information engineering and related fields, and understand the enterprise management system.

- 6.2 通识素养：具备社会、健康、安全、法律以及文化的基本素养；具有一定的军事理论和国防知识，了解中国国情，了解电子信息技术在国民经济和社会发展中的作用、地位及其发展的社会制约因素。

General knowledge literacy: basic literacy of society, health, safety, law and culture; have certain military theory and national defense knowledge, understand China's national conditions, understand the role, status and social constraints of electronic information technology in national economic and social development.

- 6.3 分析评价：能够分析评价专业工程实践和电子信息复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

Analysis and evaluation: be able to analyze and evaluate the impact of professional engineering practice and electronic information complex engineering solution on society, health, safety, law and culture, and understand the responsibilities to be undertaken.

- 7、**环境与可持续发展**：能够理解和评价针对电子信息复杂工程问题的工程实践对环境、社会可持续发展的影响。

**Environment and sustainable development:** be able to understand and evaluate the impact of engineering practice on the sustainable development of environment and society on complex engineering problems of electronic information.

- 7.1 理解内涵：理解环境保护和社会可持续发展的内涵和意义，理解电子信息工程实践对环境和社会可持续发展的影响。

Understanding connotation: understand the connotation and significance of environmental protection and social sustainable development, and understand the impact of electronic information engineering practice on the sustainable development of environment and society.

- 7.2 评价影响：能够分析复杂工程问题的电子信息专业工程实践对环境和社会可持续发展的影响，并进行合理评价，得出有效结论。

Evaluation impact: it can analyze the impact of the engineering practice of electronic information specialty on the sustainable development of environment and society, and make reasonable evaluation to draw effective conclusions.

- 8、**职业规范**：能够理解当代社会环境下的人文社会科学素养、社会责任感等知识的内涵

，并在电子信息工程实践中，理解并遵守工程职业道德和规范，履行责任。

**Professional norms:** can understand the connotation of Humanities and Social Sciences literacy, social responsibility and other knowledge in the contemporary social environment, and understand and abide by engineering professional ethics and norms in the practice of electronic information engineering, and fulfill their responsibilities.

8.1 人文社科素养：树立正确的世界观、人生观、价值观，了解中国国情，具有人文知识、思辨能力和科学精神，心理健康；

Humanities and Social Sciences literacy: establish correct world outlook, outlook on life and values, understand the national conditions of China, have humanistic knowledge, speculative ability and scientific spirit, and have mental health;

8.2 社会责任感：理解社会主义核心价值观，了解中国电子技术的发展现状，具有推动民族复兴和社会进步的责任感；

Sense of social responsibility: understand the core socialist values, understand the development status of China's electronic information technology, and have the responsibility to promote national rejuvenation and social progress;

8.3 职业道德：能够理解工程师的职业性质与责任，在电子信息工程领域的产品设计、制造、销售、服务等方面能够考虑公众的安全、健康和环境保护等因素，并自觉履行社会责任。

Professional ethics: be able to understand the professional nature and responsibility of engineers, and take into account the safety, health and environmental protection of the public in the field of electronic information engineering in terms of product design, manufacturing, sales and services, and consciously fulfill social responsibilities.

**9、个人与团队：**具有协作精神和团队意识，能够在多学科背景下的团队中担任负责人或普通团队成员角色，并负责完成角色的工作任务。

**Individual and team:** have the spirit of cooperation and team awareness, be able to act as the leader or common team member in the team under the multi-disciplinary background, and be responsible for the task of completing the role.

9.1 团队工作：能胜任团队中个体与成员的角色，在有限的时间与资源条件下，独立或协作完成团队分配的工作。

Team work: be competent for the role of individuals and members in the team, and independently or cooperate to complete the assigned work of the team under the limited time and resources conditions.

9.2 团队协作：能主动与本学科和跨学科的成员合作，共同组建团队，顺利开展工作，并通过相互沟通、协调与妥协，倾听其他团队成员的意见。

Team cooperation: be able to actively cooperate with members of the discipline and interdisciplinary, jointly form teams, carry out work smoothly, and listen to the opinions of other team members through mutual communication, coordination and compromise.

**10、沟通：**能够就电子信息复杂工程问题与业界同行及社会公众进行有效沟通和交流，包

括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

**Communication:** be able to communicate and communicate with industry peers and the public on complex engineering issues of electronic information, including writing reports and design documents, presenting statements, clearly expressing or responding to instructions. And have a certain international vision, can communicate and exchange in the cross-cultural context.

10.1 专业交流：了解本专业的前沿技术，通过撰写报告和设计文稿、陈述发言、清晰表达或回应指令等形式，并能够就复杂工程问题与业界同行及社会公众进行有效沟通和交流，展示人际交往能力。

Professional communication: understand the cutting-edge technologies of the discipline, and be able to communicate and communicate with industry peers and the public effectively on complex engineering issues through writing reports and design documents, statements, clear expression or responding to instructions, and demonstrating interpersonal communication ability.

10.2. 外语交流：熟练地掌握一门外语，拓展自身的国内与国际的社会与专业视野，开展跨文化背景下的沟通与交流。

Foreign language communication: master a foreign language skillfully, expand social and professional perspectives at home and abroad, and carry out communication and communication under the cross-cultural background.

11、**项目管理：**理解并掌握从事电子信息及相关领域所需的工程管理原理与经济决策方法，并能在多学科环境中应用。

**Project management:** understand and master the engineering management principle and economic decision method required for electronic information and related fields, and can be applied in multi-disciplinary environment.

11.1 工程管理：理解并掌握工程项目管理的基本原理与经济决策的整体框架、方法，理解工程项目的时间及成本管理、质量、安全及风险管理以及人力资源管理。

Project management: understand and master the basic principles of project management and the overall framework and method of economic decision-making, understand the time and cost management, quality, safety and risk management and human resource management of the project.

11.2 经济决策：具有一定的技术管理和经济分析能力，并在多学科环境中应用，并能够通过经济分析等方法控制电子信息系统设计与应用中的成本，找到合理/可接受的解决方法。

Economic decision making: it has certain technical management and economic analysis ability, and is applied in multi-disciplinary environment, and can control the cost in the design and application of electronic information system through economic analysis and other methods, and find reasonable / acceptable solutions.

12、**终身学习：**具有自主学习和终身学习的意识，了解在电子信息领域及未来职业发展过



程中终身学习的重要性，具有基于职业发展需求不断学习和发展的能力。

**Lifelong learning:** have the consciousness of independent learning and lifelong learning, understand the importance of lifelong learning in the field of electronic information and the future career development, and have the ability to learn and develop continuously based on the needs of career development.

12.1 学习意识：能够认识不断探索和学习的必要性，具有终身学习的意识，践行拓展知识和能力的途径。

Learning consciousness: be able to understand the necessity of continuous exploration and learning, have the consciousness of lifelong learning and practice the way to expand knowledge and ability.

12.2 学习能力：能够通过团队互助、线上线下、独立思考等自主学习方法提升自我，满足个人或职业发展的需求。

Learning ability: can improve self through team assistance, online and offline, independent thinking and other independent learning methods to meet the needs of personal or professional development.

本专业毕业要求对培养目标的支撑关系如表2-1所示。

Supporting relationship of the training objectives by the graduation requirements are shown in Table 2-1.

表2-1 毕业要求对培养目标支撑矩阵

Table 2-1 Support Matrix of Graduation Requirements and Training Objectives

| 毕业要求<br>Graduation Requirements                            | 目标1:<br>社会责任感 | 目标2:<br>发现分析/解决问题能力 | 目标3:<br>设计/研发能力 | 目标4:<br>团队合作/管理能力 | 目标5:<br>全球视野/终身学习 |
|--|---------------|---------------------|-----------------|-------------------|-------------------|
| 毕业要求1: 工程知识<br>Engineering knowledge                       |               | √                   |                 |                   | √                 |
| 毕业要求2: 问题分析<br>Problem analysis                            |               | √                   | √               |                   |                   |
| 毕业要求3: 设计/开发解决方案<br>Design/development solution            |               | √                   | √               |                   |                   |
| 毕业要求4: 研究Research  |               | √                   | √               |                   |                   |
| 毕业要求5: 使用现代工具<br>Modern-tool use                           |               | √                   | √               |                   | √                 |
| 毕业要求6: 工程与社会<br>Engineering and society                    | √             |                     | √               |                   | √                 |
| 毕业要求7: 环境与可持续发展<br>Environment and sustainable development | √             |                     |                 |                   | √                 |
| 毕业要求8: 职业规范<br>Professional norms                          | √             |                     | √               | √                 | √                 |
| 毕业要求9: 个人与团队<br>Individual and team                        |               |                     |                 | √                 |                   |
| 毕业要求10: 沟通<br>Communication                                |               |                     |                 | √                 |                   |
| 毕业要求11: 项目管理<br>Project management                         | √             |                     |                 | √                 |                   |
| 毕业要求12: 终身学习<br>Lifelong learning                          |               |                     |                 |                   | √                 |

表2-2 毕业要求指标点分解与课程关联矩阵

Table 2-2 Incidence Matrix of Index Point of Graduation Requirements and Courses

| 毕业要求<br>Graduation Requirements                          | 指标点  | 课程名称     |
|--|--|----------|
| 1、工程知识<br>Engineering knowledge: 用于解决电子信息工程及其相关领域复杂工程问题。 | 1.1表述问题: 能够将数学与自然科学的基本概念运用到电子信息工程领域复杂工程问题的适当表述之中;                    | 高等数学     |
|  |  | 线性代数     |
|  |  | 概率论与数理统计 |
|  |  | 大学物理     |
|  | 1.2 建立模型: 能够应用数学、自然科学知识和工程基础知识, 针对一个电子信息工程领域的复杂系统或者过程建立一种数学模型或者原理方程; | 大学物理实验   |
|  |  | 电路理论     |
|  |  | 模拟电子技术基础 |
|  |  | 数字电子技术基础 |

|   |  |             |
|---|--|-------------|
|   |  | 信号与线性系统     |
|   |  | 微机原理与应用     |
|   |  | 电磁场与电磁波     |
|   | 1.3问题求解：能够对数学模型和原理方程的正确性进行严谨的推理，并能正确求解；  | 通信原理        |
|   |  | 高频电路        |
|   |  | 建模与仿真       |
|   |  | 数字信号处理      |
|   | 1.4应用知识：能够利用工程和专业对电子信息工程领域复杂工程问题的解决方案进行分析，比较与综合。   | 自动控制原理      |
|   |  | 小组设计项目 2    |
|   |  | 通信与网络       |
| <b>2、问题分析</b><br><b>Problem analysis:</b> 能够应用数学、自然科学和工程科学的基本原理，识别、描述和分析电子信息复杂工程问题，结合文献研究，获得对相应复杂工程问题的深刻认识并得出有效结论。                          | 2.1识别判断：能够运用数学、自然科学和工程科学的基本原理识别和判断复杂电子信息工程问题的关键环节和参数；                                      | 高数数学        |
|   |  | 大学物理        |
|   |  | 复变函数与积分变换   |
|   |  | 电力工程        |
|   |  | 电路理论        |
|   | 2.2方案表达：能够运用数学、自然科学和工程科学的基本原理表达电子信息相关复杂工程问题的输入条件、约束关系和输出参数，并建立数学模型；                        | 线性代数        |
|   |  | 高频电路        |
|   |  | 信号与线性系统     |
|   |  | 数字电子技术基础    |
|   |  | 模拟电子技术基础    |
|   | 2.3方案分析：分析实验或模拟数据，并结合文献与互联网数据等进行检索、整理、分析和归纳，利用相关工程知识和原理揭示复杂电子信息工程问题的内在规律，分析一套或多套有效的问题解决方案； | 项目技能        |
|   |  | 高频电路实验      |
|   |  | 设计项目 1      |
|   |  | 微机原理与应用     |
| 2.4结果分析：能够应用数学、自然科学和工程科学的基本原理给出正确的工程问题解决方案，并评价解决方案的合理性。   | 通信原理   |             |
|   | 数字信号处理   |             |
|   | 电磁场与电磁波  |             |
|   | 建模与仿真  |             |
| <b>3、设计/开发解决方法</b><br><b>Design/development solution:</b> 能够针对电子信息复杂工程问题，综合考虑经济、社会、健康、安全、法律、文化以及环境等因素的影响。设计解决方案，在设计环节中体现创新意识，并对设计方案进行测试与改进。 | 3.1设计方法：掌握设计/开发电子信息工程及相关领域复杂工程问题解决方案所需要的专业知识和常用方法。   | 高频电路        |
|   |  | 通信原理        |
|   |  | 高级动力与控制     |
|   |  | 模拟电子技术基础实验  |
|   |  | 数字电子技术基础实验  |
|   | 3.2构思方案：能针对电子信息工程及相关领域复杂工程问题，综合利用专业知识，提出解决方案。设计方案应综合考虑社会、健康、安全、法律、文化以及环境等因素的影响。            | 高级数字电子学     |
|   |  | 通信与网络       |
|   |  | 毕业设计        |
|   |  | 数字信号处理      |
|   |  | 思想道德修养及法律基础 |
|   | 3.3设计方案：能够根据电子信息工程及相关领域复杂工程问题的特定需求，确定设计目标并设计满足特定指标要求的系统方案。                                 | 小组设计项目 2    |
|   |  | 单片机原理与应用    |
|   |  | 高级计算机语言编程   |
|   |  | 通信基础实验      |
| 3.4优化改进：针对已有复杂工程问题的设计方案进行研究和优化，体现创新意识。  | 自动控制原理   |             |
|   | 专业实践   |             |
|   | 设计项目 2   |             |
| <b>4、研究</b><br><b>Research:</b> 能够基于通信理论和相关科学原理，对电子信息工程及相关领域内的复杂工程问题进行研究，包括   | 4.1研究方法：能够理解和运用电子信息工程及相关领域科学原理，熟悉研究解决复杂工程问题的科学方法。  | 通信原理        |
|   |  | 信号与线性系统     |
|   |  | 电力工程        |
|   |  | 大学物理实验      |
|   | 4.2实验设计：能够针对复杂电子信息工程问题的背景和需求进行分析，选择合理可行的研究路线，并设计实验方案。                                      | 小组设计项目 1    |
|   |  | 数字电子技术基础实验  |
|   | 项目设计与执行  |             |

|  |  |   |                                 |
|--|--|---|---------------------------------|
| 设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。   | 4.3 实验构建：能够针对电子信息工程及相关领域复杂工程问题，构建实验系统，操作实验装置，科学地采集实验数据。  | 模拟电子技术基础实验<br>专业实践<br>高频电路实验  |                                 |
|  | 4.4分析归纳：能够对不同的实验方案进行分析、对比和改进，并对数据进行分析与解释，通过信息综合得到合理有效的结论。  | 通信基础实验<br>单片机原理与应用<br>工程制图与CAD<br>毕业设计  |                                 |
| <b>5、使用现代工具<br/>Modern-tool use:</b> 能够针对电子信息工程及相关领域内的复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性。 | 5.1 工具使用：熟悉现代工程工具和信息技术工具的使用方法。   | 工程制图与CAD<br>电路基础实验<br>模拟电子技术基础实验<br>计算机基础   |                                 |
|  | 5.2模拟仿真：针对电子信息工程及相关领域复杂工程问题，使用软硬件设计与仿真平台、技术等资源进行问题的预测与模拟。  | 数字电子技术基础实验<br>项目技能<br>设计项目 1<br>小组设计项目 2  |                                 |
|  | 5.3选用开发：能够合理选择、使用、开发恰当的现代工具，并理解其局限性。   | 高级计算机语言编程<br>高级动力与控制<br>小组设计项目 1  |                                 |
|  |  | 通信基础实验  |                                 |
|  |  |   |                                 |
|  | <b>6、工程与社会<br/>Engineering and society:</b> 能够基于电子信息工程背景知识进行合理分析，评价专业工程实践和电子信息复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。 | 6.1工程实践：具有工程实习和社会实践经历，熟悉电子信息工程及相关领域相关的国家和行业标准，了解电子信息技术在国民经济和社会发展中的作用、地位及其发展的社会制约因素。 | 金工电工实习<br>毕业实习<br>单片机课程设计       |
|  |  | 6.2通识素养：具备社会、安全、法律以及文化的基本素养；具有一定的军事理论和国防知识，了解中国国情。                                  | 军事理论与训练<br>思想道德修养与法律基础<br>形势与政策 |
| 6.3分析评价：能够分析评价专业工程实践和电子信息复杂工程问题解决方案对社会、健康、安全、以及文化的影响，并理解应承担的责任。  |  | 高级数字电子学<br>电子工艺实习<br>项目设计与执行<br>职业生涯规划  |                                 |
|  |  |   |                                 |
|  |  |   |                                 |
| <b>7、环境与可持续发展<br/>Environment and sustainable development:</b> 能够理解和评价针对电子信息复杂工程问题的工程实践对环境、社会可持续发展的影响。                 |  | 7.1理解内涵：理解环境保护和社会可持续发展的内涵和意义，理解电子信息工程实践对环境和社会可持续发展的影响。                              | 电磁场与电磁波<br>形势与政策<br>电子工艺实习      |
|  |  | 7.2评价影响：能够分析复杂工程问题的电子信息专业工程实践对环境和社会可持续发展的影响，并进行合理评价，得出有效结论。                         | 自动控制原理<br>微机原理与应用<br>毕业实习       |
|  |  |   |                                 |
|  |  |   |                                 |
|  | <b>8、职业规范<br/>Professional norms:</b> 能够理解当代社会环境下的人文社会科学素养、社会责任感等知识的内涵，并在  | 8.1人文社科素养：树立正确的世界观、人生观、价值观，了解中国国情，具有人文知识、思辨能力和科学精神，心理健康。                            | 马克思主义基本原理<br>形势与政策<br>大学生心理健康教育 |
| 8.2社会责任感：理解社会主义核心价值观，了解中国电子信息技术的发展现状，具有推动民族复兴和社会进步的责任感。  |  | 毛泽东思想和中国特色社会主义理论体系概论<br>中国近现代史纲要<br>微机原理与应用   |                                 |
|  |  |   |                                 |
|  |  |   |                                 |

|   |   |             |
|---|---|-------------|
| 电子信息工程实践中,理解并遵守工程职业道德和规范,履行责任。  | 8.3职业道德:能够理解工程师的职业性质与责任,在电子信息工程实践中能够考虑公众的安全 and 环境保护等因素,并自觉履行社会责任。                        | 思想道德修养及法律基础 |
|   |   | 电子工艺实习      |
|   |   | 金工电工实习      |
|   |   | 毕业实习        |
| 9、个人与团队<br><b>Individual and team:</b> 具有协作精神和团队意识,能够在多学科背景下的团队中担任负责人或普通团队成员角色,并负责完成角色的工作任务。                            | 9.1团队工作:能胜任团队中个体与成员的角色,在有限的时间与资源条件下,独立或协作完成团队分配的工作。                                       | 数字电子技术基础    |
|   |   | 小组设计项目 1    |
|   |   | 大学生心理健康教育   |
|   |   | 金工电工实习      |
|   |   | 信号与线性系统     |
|   | 9.2团队协作:能主动与本学科和跨学科的成员合作,共同组建团队,顺利开展工作,并通过相互沟通、协调与妥协,倾听其他团队成员的意见。                         | 军事理论与训练     |
|   |   | 大学体育        |
|   |   | 创业基础        |
|   |   | 课外创新实践      |
|   |   | 毕业实习        |
| 10、沟通<br><b>Communication</b> :能够就电子信息复杂工程问题与业界同行及社会公众进行有效沟通和交流,包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野,能够在跨文化背景下进行沟通和交流。 | 10.1专业交流:了解本专业的前沿技术,通过撰写报告和设计文稿、陈述发言、清晰表达或回应指令等形式,并能够就复杂工程问题与业界同行及社会公众进行有效沟通和交流,展示人际交往能力。 | 课外创新实践      |
|   |   | 电路基础实验      |
|   |   | 高频电路实验      |
|   |   | 项目设计与执行     |
|   |   | 英语听说        |
|   | 10.2 外语交流:熟练地掌握一门外语,拓展自身的国内与国际的社会与专业视野,开展跨文化背景下的沟通与交流。                                    | 英语读写        |
|   |   | 专业英语        |
|   |   | 批判性思维       |
|   |   | 毕业设计        |
|   |   |             |
| 11、项目管理<br><b>Project management:</b> 理解并掌握从事通信及相关领域所需的工程管理原理与经济决策方法,并能在多学科环境中应用。                                       | 11.1工程管理:理解并掌握工程项目管理的基本原理与经济决策的整体框架、方法,理解工程项目的管理及成本管理、质量、安全及风险管理以及人力资源管理。                 | 金工电工实习      |
|   |   | 设计项目 2      |
|   |   | 商务与运营管理     |
|   |   | 电子工艺实习      |
|   | 11.2经济决策:具有一定的统计分析能力,并在多学科环境中应用,并能够通过经济分析等方法控制电子信息系统设计与应用中的成本,找到合理/可接受的解决方法。              | 概率论与数理统计    |
|   |   | 毕业设计        |
|   |   | 课外创新实践      |
|   |   |             |
| 12、终身学习<br><b>Lifelong learning:</b> 具有自主学习和终身学习的意识,了解在电子信息领域及未来职业发展过程中终身学习的重要性,具有基于职业发展需求不断学习和发展的能力。                   | 12.1学习意识:能够认识不断探索和学习的必要性,具有终身学习的意识,践行拓展知识和能力的途径。  | 大学体育        |
|   |   | 职业生涯规划      |
|   |   | 创业基础        |
|   |   | 毕业实习        |
|   |   | 电路理论        |
|   | 12.2学习能力:能够通过团队互助、线上线下、独立思考等自主学习方法提升自我,满足个人或职业发展的需求。                                      | 计算机基础       |
|   |   | 信号与线性系统     |
|   |   | 毕业设计        |
|   |   |             |
|   |   |             |

### 三、主要课程

电路理论、电子技术基础、高频电路、信号与线性系统、单片机原理与应用、通信原理、数字信号处理、电磁场与电磁波、自动控制原理,项目技能,设计项目 1,设计项目 2,专业

实践, 小组设计项目 1, 小组设计项目 2, 电力工程, 建模与仿真, 高级数字电子学, 通信与网络, 高级动力与控制, 商务与运营管理, 项目设计与执行, 个人项目-项目研究方法等。

Circuit theory, electronic technology foundation, high-frequency circuit, signal and linear system, single-chip principle and application, communication principle, digital signal processing, electromagnetic field and electromagnetic wave , automatic control principle, Project Skills, Design Project 1, Design Project 2, Professional Practice, Group Design Project 1, Group Design Project 2, Power Engineering, Modelling and Simulation, Advanced Digital Electronics, Communications and Networks, Advanced Power and Control, Business and Operations Management, Project Design and Implementation, Individual Project - project research methodology.

## 四、学制及授予学位

**基本学制:** 四年

Duration: four years

**授予学位:** 工学学士

Degree Conferred: Bachelor of Engineering

## 五、学时与学分

**最低学分:** 毕业最低学分172学分, 其中必修143.5学分(不计算课外创新实践学分), 选修24.5学分, 课外创新实践4学分。

Minimum credits: 172 credits for minimum credits, of which 143.5 credits (not counting extracurricular innovation practice credits), 24.5 credits, and 4 credits for extracurricular innovations.

## 六、课程平台及实践教学体系学分分配表

### (一) 课程平台学分分配汇总表

Course platform allocation table

| 课程平台<br>Course platform                       | 课程性质<br>Course Type | 毕业最低学分Minimum credit | 占毕业最低学分百分比%<br>Percentage |
|---|---------------------|----------------------|---------------------------|
| 通识教育<br>Basic Courses in General Education    | 必修<br>Compulsory    | 42                   | 24.4%                     |
|   | 选修<br>Elective      | 4                    | 2.3%                      |
| 专业学科大类<br>Specialty major subjects            | 必修<br>Compulsory    | 27                   | 15.7%                     |
|   | 选修<br>Elective      | 1                    | 0.6%                      |
| 专业基础<br>Specialty Base Courses                | 必修<br>Compulsory    | 36                   | 20.9%                     |
| 专业方向<br>Specialty direction                   | 必修<br>Compulsory    | 20.5                 | 11.9%                     |
|   | 选修<br>Elective      | 19.5                 | 11.4%                     |
| 集中实践教学环节<br>Group Practical training          | 必修<br>Compulsory    | 18                   | 10.5%                     |
| 课外创新实践<br>Extracurricular innovation activity |                     | 4                    | 2.3%                      |
| 总学分<br>Total                                  |                     | 172                  | 100%                      |

### (二) 专业实践教学体系学分分配表

Specialty Practical Lecturing Credit Allocation Table

| 实践教学<br>Practical lecturing                               | 实践教学内容<br>content   | 学分分配<br>credit | 占总学分百分比<br>percentage |
|---|---|----------------|-----------------------|
| 专业课内实践教学<br>Specialty course Internal practical lecturing | 专业课程教学内的实践内容<br>Specialty course internal practical lecturing content | 15.5           | 9%                    |
| 独立实践(实验)课<br>Independent Practical (experimental) courses | 实践(实验)课<br>Practical Lecturing  | 5.5            | 3.2%                  |
| 集中实践教学环节<br>Group Practical training                      | 军事理论与训练<br>Military Theory and Training                               | 2              | 1.2%                  |
|   | 见习、实习<br>Internship   | 8              | 4.7%                  |
|   | 毕业论文(设计)<br>Undergraduate Thesis (ManMet: Individual Project)         | 8              | 4.7%                  |
| 课外创新实践<br>Extracurricular innovation activity             | 课外创新实践活动<br>Extracurricular innovation activity                       | 4              | 2.3%                  |
| 小计<br>Total   |   | 43             | 25%                   |

## 七、课程设置明细

### Details of the curriculum

(一) 通识教育课程平台 (应修46学分: 必修42学分, 选修4学分)

General Education Course Platform (46 credits required: 42 credits, 4 credits)

1. 通识教育课程平台必修课程 (42 学分)

General Education Curriculum Platform Compulsory Course (42 credits)

| 课程名称 (中英文)<br>Course Name  | 课程编码<br>Course code | 学分<br>Credit | 总学时<br>Total Hours | 学时分配          |                |                  | 建议修读学期<br>Semester | 修读说明<br>Note                                 |
|--|---------------------|--------------|--------------------|---------------|----------------|------------------|--------------------|--|
|  |                     |              |                    | 讲授<br>Lecture | 实践<br>Practice | 实验<br>Experiment |                    |  |
| 思想道德修养与法律基础<br>Moral Education and Fundamentals of Law   | 161101              | 3            | 64                 | 32            | 32             |                  | 1                  |  |
| 中国近现代史纲要<br>An Outline of Modern Chinese History   | 161102              | 3            | 64                 | 32            | 32             |                  | 2                  |  |
| 毛泽东思想和中国特色社会主义理论体系概论<br>An Introduction to Mao Zedong Thought and Theories of Socialism with Chinese Characteristics | 161103              | 5            | 112                | 48            | 64             |                  | 3                  |  |
| 马克思主义基本原理<br>Fundamental Principles of Marxism   | 161104              | 3            | 64                 | 32            | 32             |                  | 4                  |  |
| 大学体育基础素质课<br>Basic Quality Course of College Physical Education  | 411S01              | 1            | 36                 | 4             | 32             |                  | 1                  |  |
| 大学体育基础技能课<br>Basic Skill Course of College Physical Education  | 411S02              | 1            | 36                 | 4             | 32             |                  | 2                  |  |
| 大学体育专项素质课<br>Specific Quality Course of College Physical Education   | 411S03              | 1            | 36                 | 4             | 32             |                  | 3                  |  |
| 大学体育专项技能课<br>Specific Skill Course of College Physical Education   | 411S04              | 1            | 36                 | 4             | 32             |                  | 4                  |  |
| 英语听说 1<br>English Listening and Speaking 1   | 741Y01              | 4            | 64                 | 64            |                |                  | 1                  | 合作授课( 曼城大质量保证)<br>Joint delivery (ManMet QA) |
| 英语读写 1<br>English Reading and Writing 1  | 741Y02              | 4            | 64                 | 64            |                |                  | 1                  | 合作授课( 曼城大质量保证)<br>Joint delivery (ManMet QA) |



|   |        |   |    |    |    |  |     |   |
|---|--------|---|----|----|----|--|-----|---|
| 英语听说 2<br>English Listening and Speaking 2              | 741Y03 | 2 | 32 | 32 |    |  | 2   | 合作授课( 曼城<br>大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 英语读写 2<br>English Reading and Writing 2                 | 741Y04 | 2 | 32 | 32 |    |  | 2   | 合作授课( 曼城<br>大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 批判性思维<br>Critical Thinking                              | 741Y05 | 2 | 32 | 32 |    |  | 2   | 合作授课( 曼城<br>大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 专业英语（电子信息工程）<br>Specialized English（Electronic          | 741E01 | 2 | 32 | 32 |    |  | 2   |   |
| 计算机基础<br>Computer Basis                                 | 371C01 | 2 | 40 | 24 | 16 |  | 1   |   |
| 大学生心理健康教育<br>College Student Mental Health<br>Education | 631X01 | 2 | 48 | 16 | 32 |  | 1   |   |
| 职业生涯规划<br>Career Planning                               | 641Z01 | 1 | 18 | 14 | 4  |  | 1   |   |
| 形势与政策<br>Situation and Policy                           | 621I01 | 2 | 64 | 64 |    |  | 1-8 |   |
| 创业基础<br>Entrepreneurial Basis                           | 641Z02 | 1 | 20 | 12 | 8  |  | 5   |   |

## 2. 通识教育课程平台选修课程（4学分）

General Education Curriculum Platform Elective Course (4 credits)

| 通识选修课程模块<br>General elective course module                | 修读说明<br>Note  |
|---|---|
| 科学精神与科学技术<br>Scientific spirit and science and technology | 至少修满4学分，建议选修科学精神与科学技术和跨文化交际<br><br>At least 4 credits. Recommend elective course are Science Spirit and Science and Technology and Intercultural communication. |
| 社会发展与公民教育<br>Social development and civic education       |   |
| 人文经典与人生修养<br>Humanistic classics and life cultivation     |   |
| 艺术鉴赏与审美人生<br>Art Appreciation and Aesthetic Life          |   |
| 跨文化交际<br>Intercultural Communication                      |   |

(二) 专业学科大类课程平台 (应修28学分: 必修27学分, 选修1学分)

Specialty major course platform (28 credits required: 27 credits, 1 credits)

1. 专业学科大类课程平台必修课程 (27 学分)

Compulsory courses for specialty major courses (27 credits)

| 课程名称 (中英文)<br>Course Name  | 课程编码<br>Course code | 学分<br>Credit | 总学时<br>Total Hours | 学时分配 |    |    | 建议<br>修读<br>学期<br>Semester | 修读 说明<br>Note                                      |
|--|---------------------|--------------|--------------------|------|----|----|----------------------------|--|
|  |                     |              |                    | 讲授   | 实践 | 实验 |                            |  |
| 高等数学C(1)<br>Advanced Mathematics C (1)                                   | 742E03              | 4            | 64                 | 64   |    |    | 1                          | 合作授课<br>(曼城大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 高等数学C(2)<br>Advanced Mathematics C (2)                                   | 742E04              | 5.0          | 80                 | 80   |    |    | 2                          | 合作授课<br>(曼城大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 概率论与数理统计<br>Probability Theory and<br>Mathematical Statistics            | 742E05              | 3.5          | 56                 | 56   |    |    | 2                          | 合作授课<br>(曼城大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 高级计算机语言编程<br>Advanced Computer Language<br>Programming                   | 742E01              | 3.5          | 64                 | 48   | 16 |    | 2                          |  |
| 线性代数<br>Linear Algebra   | 742E06              | 3            | 48                 | 48   |    |    | 1                          | 合作授课<br>(曼城大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 大学物理B(1)<br>College Physics B (1)  | 742E07              | 3            | 48                 | 48   |    |    | 2                          | 合作授课<br>(曼城大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 大学物理实验B(1)<br>Experiment of College Physics B (1)                        | 746E01              | 0.5          | 16                 |      |    | 16 | 2                          | 合作授课<br>(曼城大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 大学物理B(2)<br>College Physics B (2)  | 742E08              | 2            | 32                 | 32   |    |    | 3                          | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 大学物理实验B(2)<br>Experiment of College Physics B (2)                        | 746E02              | 0.5          | 16                 |      |    | 16 | 3                          | 合作授课<br>(曼城大质量保证)<br>Joint delivery<br>(ManMet QA) |
| 复变函数与积分变换<br>Functions of Complex Variables & Integral<br>Transformation | 742E09              | 2            | 32                 | 32   |    |    | 3                          |  |

## 2. 专业学科大类课程平台选修课程（3学分选1学分）

Elective courses for Specialty major course platforms (3 credits 1)

| 课程名称（中英文）<br>Course Name  | 课程编码<br>Course code | 学分<br>Credit | 总学时<br>Total Hours | 学时分配   |        |        | 建议<br>修读<br>学期<br>Semester | 修读<br>说明<br>Note |
|---|---------------------|--------------|--------------------|--------|--------|--------|----------------------------|------------------|
|   |                     |              |                    | 讲<br>授 | 实<br>践 | 实<br>验 |                            |                  |
| MATLAB程序设计及应用<br>MATLAB Language Program Design and Application   | 742E10              | 1            | 32                 |        | 32     |        | 3                          |                  |
| 电子信息技术导论<br>Electronics Information Technique Guided Introduction | 742E02              | 2            | 32                 | 32     |        |        | 1                          |                  |

## （三）专业核心课程平台（必修36学分）

Specialty core course platform (required 36 credits)

| 课程名称（中英文）<br>Course Name                      | 课程编码<br>Course code | 学分<br>Credit | 总学时<br>Total Hours | 学时分配   |        |        | 建议<br>修读<br>学期<br>Semester | 修读<br>说明<br>Note                                   |
|---|---------------------|--------------|--------------------|--------|--------|--------|----------------------------|--|
|   |                     |              |                    | 讲<br>授 | 实<br>践 | 实<br>验 |                            |  |
| 工程制图与CAD<br>Graphing of Engineering and CAD   | 743E01              | 2            | 40                 | 24     | 4      | 12     | 1                          |  |
| 项目技能<br>Project Skills                        | 743E02              | 1.5          | 40                 | 8      |        | 32     | 2                          | 合作授课<br>Joint delivery                             |
| 设计项目1<br>Design Project 1                     | 743E03              | 1.5          | 40                 | 8      |        | 32     | 3                          | 合作授课<br>Joint delivery                             |
| 电路理论<br>Theory of Circuit                     | 743E11              | 3.5          | 56                 | 56     |        |        | 2                          | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 电路基础实验<br>Basic Electronic Circuit Experiment | 746E03              | 0.5          | 16                 |        |        | 16     | 2                          | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 设计项目2<br>Design Project 2                     | 743E04              | 1.5          | 40                 | 8      |        | 32     | 4                          | 合作授课<br>Joint delivery                             |
| 专业实践<br>Professional Practice                 | 743E05              | 1.5          | 36                 | 12     |        | 24     | 5                          | 合作授课<br>Joint delivery                             |

|  |        |     |    |    |    |    |   |  |
|--|--------|-----|----|----|----|----|---|--|
| 小组设计项目1<br>Group Design Project 1                                | 743E06 | 1   | 28 | 4  |    | 24 | 5 | 合作授课<br>Joint delivery                             |
| 模拟电子技术基础<br>The Base of Analogue Electronics<br>Technique        | 743E12 | 4   | 64 | 64 |    |    | 3 | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 模拟电子技术基础实验<br>Basic Analogue Electronic Technology<br>Experiment | 746E04 | 0.5 | 16 |    |    | 16 | 3 | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 小组设计项目2<br>Group Design Project 2                                | 743E07 | 2   | 56 | 8  |    | 48 | 6 | 合作授课<br>Joint delivery                             |
| 数字电子技术基础<br>The Base of Digital Electronics<br>Technique         | 743E13 | 3   | 48 | 48 |    |    | 4 | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 数字电子技术基础实验<br>Basic Digital Electronic Technology<br>Experiment  | 746E05 | 0.5 | 16 |    |    | 16 | 4 | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 信号与线性系统<br>Signals and Linear Systems                            | 743E08 | 3   | 48 | 48 |    |    | 4 |  |
| 单片机原理与应用<br>Single Chip Computer Theory and<br>Application       | 743E14 | 3   | 64 | 32 | 16 | 16 | 4 | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 电磁场与电磁波<br>Electromagnetic Fields & Magnetic<br>Waves            | 743E09 | 2   | 32 | 32 |    |    | 4 |  |
| 通信原理<br>Communication Theory                                     | 743E15 | 3   | 48 | 48 |    |    | 6 | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 数字信号处理<br>Digital Signal Processing                              | 743E10 | 2   | 32 | 32 |    |    | 5 |  |

(四) 专业方向课程平台

Specialty direction course platform (40 credits, 20.5 credits, 19.5 credits)

1. 必修课程 (20.5学分)

Compulsory course (20.5 credits)

| 课程名称 (中英文)<br>Course Name                               | 课程编码<br>Course code | 学分<br>Credit | 总学时<br>Total Ho | 学时分配 |    |    | 建议<br>修读<br>学期<br>Semester | 修读<br>说明<br>Note                                   |
|---|---------------------|--------------|-----------------|------|----|----|----------------------------|--|
|   |                     |              |                 | 讲授   | 实践 | 实验 |                            |  |
| 电力工程<br>Power Engineering                               | 744E01              | 1.5          | 36              | 12   |    | 24 | 5                          | 曼城大授课<br>ManMet delivery                           |
| 建模与仿真<br>Modelling and Simulation                       | 744E02              | 1.5          | 36              | 12   |    | 24 | 5                          | 曼城大授课<br>ManMet delivery                           |
| 高频电路<br>High-Frequency Circuit                          | 744E25              | 3            | 48              | 48   |    |    | 5                          | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 高频电路实验<br>High Frequency Circuit Experiment             | 746E06              | 0.5          | 16              |      |    | 16 | 5                          | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 单片机课程设计<br>The Course Design of Single Chip<br>Computer | 744E14              | 1            | 32              |      | 32 |    | 5                          |  |
| 自动控制原理<br>Automatic Control Theory                      | 744E09              | 3            | 56              | 40   |    | 16 | 5                          | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |
| 通信与网络<br>Communications and Networks                    | 744E03              | 1.5          | 36              | 12   |    | 24 | 6                          | 曼城大授课<br>ManMet<br>delivery                        |
| 高级动力与控制<br>Advanced Power and Control                   | 744E04              | 1.5          | 36              | 12   |    | 24 | 7                          | 曼城大授课<br>ManMet<br>delivery                        |
| 高级数字电子学<br>Advanced Digital Electronics                 | 744E05              | 1.5          | 36              | 12   |    | 24 | 6                          | 曼城大授课<br>ManMet<br>delivery                        |
| 商务与运营管理<br>Business and Operations Management           | 744E06              | 1.5          | 36              | 12   |    | 24 | 7                          | 曼城大授课<br>ManMet<br>delivery                        |
| 通信基础实验<br>Basic Communication Experiment                | 746E07              | 0.5          | 16              |      |    | 16 | 6                          | 合作授课(曼城大<br>质量保证)<br>Joint delivery<br>(ManMet QA) |

|  |        |     |    |    |  |    |   |                        |
|--|--------|-----|----|----|--|----|---|------------------------|
| 项目设计与执行<br>Project Design and Implementation     | 744E07 | 1.5 | 40 | 8  |  | 32 | 7 | 合作授课<br>Joint delivery |
| 微机原理与应用<br>Micro-Computer Theory and Application | 744E10 | 2   | 32 | 32 |  |    | 5 |                        |

2. 选修课程（31学分，含任意选修课2学分，选19.5学分）

Elective course (31 credits, including 2 electives in any elective course, 18)

| 课程名称（中英文）<br>Course Name  | 课程编码<br>Course code | 学分<br>Credit | 总学时<br>Total Hours | 学时分配 |    |    | 建议修读学期<br>Semester | 修读说明<br>Note                                |
|---|---------------------|--------------|--------------------|------|----|----|--------------------|---|
|   |                     |              |                    | 讲授   | 实践 | 实验 |                    |   |
| 信息论与编码<br>Informatics & Coding                                    | 744E15              | 3            | 48                 | 48   |    |    | 5                  |   |
| 锁相技术<br>Phase Lock Technique                                      | 744E16              | 2            | 40                 | 24   | 8  | 8  | 6                  |   |
| ARM嵌入式系统原理与应用<br>Principle and Application of ARM Embedded System | 744E11              | 2            | 40                 | 24   | 4  | 12 | 7                  | 合作授课(曼城大质量保证)<br>Joint delivery (ManMet QA) |
| 计算机网络<br>Computer Network   | 744E17              | 2            | 32                 | 32   |    |    | 5                  |   |
| DSP原理与应用<br>DSP Theory and Application                            | 744E12              | 1.5          | 32                 | 16   | 16 |    | 6                  |   |
| 随机信号分析<br>Radom Signal Analysis                                   | 744E18              | 2            | 32                 | 32   |    |    | 5                  |   |
| 密码学与信息安全<br>Cryptography and Information Security                 | 744E19              | 2            | 32                 | 32   |    |    | 6                  |   |
| 数字图像处理<br>Digital Image Processing                                | 744E20              | 2            | 32                 | 32   |    |    | 6                  |   |
| 移动通信<br>Mobile Communication                                      | 744E13              | 2            | 32                 | 32   |    |    | 6                  | 合作授课(曼城大质量保证)<br>Joint delivery (ManMet QA) |
| 软件技术基础<br>Basis of Software Technique and Design                  | 744E21              | 3.5          | 64                 | 48   | 4  | 12 | 4                  |   |
| 面向对象程序设计<br>Object oriented Program Design                        | 744E22              | 2            | 40                 | 24   | 4  | 12 | 3                  |   |

|  |   |   |    |    |    |    |   |  |
|--|---|---|----|----|----|----|---|--|
| EDA应用设计<br>Design of EDA Technology              | 744E23  | 2 | 48 | 16 | 16 | 16 | 6 |  |
| 微波技术基础<br>The base of Microwave Technology       | 744E24  | 3 | 56 | 40 | 4  | 12 | 6 |  |
| 专业任意选修课模块<br>Specialty arbitrary elective module | 本专业学生可在全校范围内选修跨专业的相关课程（2学分）<br>Students in this major can ary courses (2credits) throughout the choose Interdisciplin school. |   |    |    |    |    |   |  |

#### （五）课外创新实践活动（4学分）

##### Extracurricular Innovation Practice Activities (4 credits)

执行《湖北大学“第二课堂成绩单”制度实施方案》、《湖北大学“第二课堂成绩单”学分认定管理办法》文件中规定。

The implementation of the "Hubei University "Second Class transcripts" system implementation plan", "Hubei University "Second Class transcripts" credit management measures" document.

## 八、实践实习教学环节

### List of courses in concentrated practice teaching (18 credits)

| 课程名称（中英文）<br>Course name   | 课程编码<br>Course code | 学分数<br>Credit | 周数<br>Total weeks | 修读学期<br>Semester   |
|--|---------------------|---------------|-------------------|--|
| 军事理论与训练<br>Military Theory and Training                          | 636J01              | 2             | 4周<br>4 weeks     | 1  |
| 毕业实习<br>Graduation practice                                      | 746Z01              | 4             | 4周<br>4 weeks     | 7  |
| 毕业设计(论文)<br>Undergraduate Thesis<br>(ManMet: Individual Project) | 746Z02              | 8             | 16周<br>16 weeks   | 8<br>合作授课(曼城<br>大质量保证)<br>Joint delivery<br>(ManMet QA)* |
| 金工、电工实习<br>Metalworking,Electrical Practice                      | 746Z03              | 2             | 2周<br>2 weeks     | 3  |
| 电子工艺实习<br>Electronics Technique<br>Practice                      | 746Z04              | 2             | 2周<br>2 weeks     | 4  |

\*: Students will be asked to complete one project that meets ManMet (project) and Hubei (thesis) requirements. To be marked by Hubei. Project will be written in English. Students are required to make oral presentation and complete a dissertation for the thesis.

## 九、修读指导

### Guidance

1. 学生应按照学校有关规定在通识教育阶段修满 46 个学分。

Students should complete 46 credits in the general education stage in accordance with the relevant regulations of the school.

2. 学生应按照学校有关规定在专业学科大类课程平台中必须修满 28 及以上学分。

Students should complete 28 or more credits in the specialty major curriculum platform in accordance with the relevant regulations of the school.

3. 在专业基础课程平台中必须修满规定的学分。

The required credits must be filled in the professional base curriculum platform.

4. 本专业学生在专业方向课程平台中必须修满规定的学分。

Students in this major must complete the required credits in the professional direction course platform.

5. 课外创新实践活动按相关要求修满 4 学分

Extracurricular innovation practice activities completed 4 credits according to relevant requirements

6. 集中性实践教学环节课程按相关要求修满 18 学分。

The centralized practical teaching course will complete 18 credits according to relevant requirements.

7. 满足本培养方案规定的相关要求，外语考试成绩符合本科毕业生的要求，通过论文答辩者，准予毕业。符合学校学位授予条件者，授予工学学士学位。

Meet the relevant requirements of the training program, the foreign language test scores meet the requirements of undergraduate graduates, through the thesis respondent, approved to graduate. A bachelor's degree in engineering is awarded in accordance with the conditions for granting a degree.



## 英国曼彻斯特城市大学承担/监督课程一览表

### List of courses undertaken/overseen by Manchester Metropolitan University

| 专业学科大类平台课程   |               |                 |
|--|---------------|-----------------|
| 课程名称 Course Name   | 开课学期 Semester | 总学时 Total Hours |
| 英语听说1<br>English<br>Listening and Speaking 1               | 1             | 64              |
| 英语读写1<br>English<br>Reading and writing 1                  | 1             | 64              |
| 英语听说2<br>English<br>Listening and Speaking 2               | 2             | 32              |
| 英语读写2<br>English<br>Reading and Writing 2                  | 2             | 32              |
| 英语批判性思维<br>Critical thinking                               | 2             | 32              |
| 高等数学 C(1)<br>Advanced Mathematics C (1)                    | 1             | 64              |
| 高等数学 C(2)<br>Advanced Mathematics C (2)                    | 2             | 80              |
| 概率论与数理统计<br>Probability Theory and Mathematical Statistics | 2             | 56              |
| 线性代数<br>Linear Algebra                                     | 1             | 48              |
| 大学物理 B(1)<br>College Physics B (1)                         | 2             | 48              |
| 大学物理实验 B(1)<br>Experiment of College Physics B (1)         | 2             | 16              |
| 大学物理 B(2)<br>College Physics B (2)                         | 3             | 32              |
| 大学物理实验 B(2)<br>Experiment of College Physics B (2)         | 3             | 16              |
| 小计   |               | 584             |

| 专业基础和方向课程   |               |                 |
|---|---------------|-----------------|
| 课程名称 Course Name  | 开课学期 Semester | 总学时 Total Hours |
| 项目技能<br>Project Skills  | 2             | 40              |
| 设计项目1<br>Design Project 1                                     | 3             | 40              |
| 电路理论<br>Theory of Circuit                                     | 2             | 56              |
| 电路基础实验<br>Basic Electronic Circuit Experiment                 | 2             | 16              |
| 设计项目2<br>Design Project 2                                     | 4             | 40              |
| 专业实践<br>Professional Practice                                 | 5             | 36              |
| 小组设计项目1<br>Group Design Project 1                             | 5             | 28              |
| 模拟电子技术基础<br>The Base of Analogue Electronics Technique        | 3             | 64              |
| 模拟电子技术基础实验<br>Basic Analogue Electronic Technology Experiment | 3             | 16              |
| 小组设计项目2<br>Group Design Project 2                             | 6             | 56              |
| 数字电子技术基础<br>The Base of Digital Electronics Technique         | 4             | 48              |
| 数字电子技术基础实验<br>Basic Digital Electronic Technology Experiment  | 4             | 16              |
| 单片机原理与应用<br>Single Chip Computer Theory and Application       | 4             | 64              |
| 通信原理<br>Communication Theory                                  | 6             | 48              |
| 电力工程<br>Power Engineering                                     | 5             | 36              |
| 建模与仿真<br>Modelling and Simulation                             | 5             | 36              |
| 高频电路<br>High-Frequency Circuit                                | 5             | 48              |
| 高频电路实验<br>High Frequency Circuit Experiment                   | 5             | 16              |
| 自动控制原<br>Automatic Control Theory                             | 5             | 56              |
| 通信与网络<br>Communications and Networks                          | 6             | 36              |

|   |                  |                    |
|---|------------------|--------------------|
| 高级动力与控制<br>Advanced Power and Control                             | 7                | 36                 |
| 高级数字电子学<br>Advanced Digital Electronics                           | 6                | 36                 |
| 商务与运营管理<br>Business and Operations Management                     | 7                | 36                 |
| 通信基础实验<br>Basic Communication Experiment                          | 6                | 16                 |
| 项目设计与执行<br>Project Design and Implementation                      | 7                | 40                 |
| ARM嵌入式系统原理与应用<br>Principle and Application of ARM Embedded System | 7                | 40                 |
| 移动通信<br>Mobile Communication                                      | 6                | 32                 |
| 小计  |                  | 1032               |
| 实践实习教学环节  |                  |                    |
| 课程名称<br>Course Name   | 开课学期<br>Semester | 总学时<br>Total Hours |
| 毕业设计(论文)<br>Undergraduate Thesis<br>(ManMet: Individual Project)  | 8                | 16周(128学时)         |

外方大学承担专业学科大类平台课程8门(360学时),专业基础和方向课程27门(1032学时),实践实习教学环节1门(128学时),总计36门课程,总学时为1540学时,占专业核心课程总门数(共54门)的66.7%,占专业核心课总学时(共2256学时)的68.2%。该专业总课程门数为77门,总学时为3214学时,外方大学承担的课程占该专业课总门数的46.8%,承担的总学时占该专业总学时的33.33%。

### 引进MMU资源统计

#### Statistics of MMU resources introduced to the program

| 内容 Content  | 百分比 Percentage    |
|---|-------------------|
| 引进 MMU 课程站全部课程比例<br>The proportion of MMU course to all courses | 46.8% (36/77)     |
| 引进专业核心课程占全部核心课程比  | 66.7% (36/54)     |
| MMU 教师担负的专业核心课程占全   | 66.7% (36/54)     |
| MMU 教师担负专业课程教学时数占   | 33.3% (1072/3214) |