# 自动化专业本科培养方案 2017 版（2019 级）
# Automation Major Undergraduate Education Program

## 一、专业简介
## Ⅰ Program Introduction

专业名称：自动化

专业代码：080801

学科门类：工学

Specialty Name：Automation

Specialty Code：080801

Discipline Category：Engineering

自动化专业始建于 1978 年，1985 年开始招收培养硕士研究生，1990 年获得控制理论与控制工程硕士学位授予权；2000 年获得控制工程专业硕士学位授予权；2013 年获国务院授权为控制科学与工程一级学科博士点，2014 年经国家人力资源和社会保障部批准设立控制科学与工程博士后科研流动站。自动化本科专业是国家级专业综合改革试点专业、河南省特色专业，2011 年获批自动化专业教育部卓越班开办资格，控制技术教学团队为河南省教学团队。

本专业培养具有国际视野、符合行业发展需求、具有创新意识的自动化专业卓越工程技术人才，工艺与信息并重，注重基础知识与理论，强化工程实践能力培养。本专业学生能够在运动控制、过程控制、工业机器人系统、工业物联网工程、检测与仪表等方面从事工程设计、产品开发及相关技术开发方面的工作。

Automation was founded in 1978, and began to recruit graduate students in 1985. In 1990, the master degree of control theory and control engineering was granted, and in 2000 the master's degree of control engineering was granted. The doctor's degree authorization of Control Science and Engineering first-level discipline was awarded in 2013. While in 2014, post-doctoral research station of Control Science and Engineering discipline was approved by the Ministry of Human Resources and Social Security. Automation specialty is a national specialized comprehensive reform pilot specialty, Henan province characteristic specialty. In 2011, the Ministry of Education approved the automation professional excellence class qualification, and the control technology teaching team is the teaching team of Henan Province

This program aims at training excellent applied-type automation engineers with international view and innovations, and the students will meet the need of automation industry. This program focuses on basic theories and knowledge and strengthens practical ability, and pay attention on both processes and information technology. The students can engage in engineering design, product development, technology development in the field of motion control, process control, industrial robot, industrial internet of things, and signal detection and instrument.

## 二、培养目标
## Ⅱ Program Objective

本专业按照"厚基础、宽口径、重实践、求创新、强素质"的人才培养指导思想，培养适应社会经济发展需求，能在运动控制系统、过程控制系统、工业机器人系统、工业物联网、计算机控制系统等自动化工程及技术领域，从事控制系统与装备设计、开发、维护、管理等工作，具有基础扎

实、善于实践、勇于创新、综合素质高、社会责任感强的应用研究型高级专门人才。

学生毕业5年左右预期具有如下能力：

（1）具有社会主义核心价值观、良好的理工与人文素养，理解并坚守工程职业道德与社会责任感；

（2）系统掌握自动化基础理论与技术，融会贯通数理基本知识与工程基础知识，能够设计自动化复杂工程问题解决方案，具备承担自动化工程项目的能力；

（3）具有良好的团队合作与组织能力，在工程实施中能综合评价自动化技术对法律、环境与可持续性发展等影响因素；

（4）具备良好的主动发展意识、创新精神与自主终身学习能力；

（5）具备良好的表达能力与国际视野。

According to the training guideline of "strengthening foundation, broadening specialty, enhancing capability, improving quality and outstanding features", this major aims to meet the needs of social and economic development, and cultivate undergraduates who can be qualified in motion control systems, process control systems, industrial robot systems, industrial Internet of Things, computer control system and other automation engineering and technology fields, and can be engaged in control system and equipment design, development, maintenance and management, etc., with a solid foundation, good practice, innovation, high comprehensive quality, and strong sense of social responsibility.

Students are expected to have the following abilities within 5 years after graduation:

(1) Possess socialist core values, good science, engineering and humanities, understand and adhere to engineering professional ethics and a sense of social responsibility;

(2) Master the basic theory and technology of automation systematically, integrate basic mathematical knowledge and basic engineering knowledge, be able to design solutions to complex automation engineering problems, and have the ability to undertake automation engineering projects;

(3) Have good teamwork and organizational skills, and be able to comprehensively evaluate the influence factors of automation technology on law, environment and sustainable development during project implementation;

(4) Have a good sense of active development, innovative spirit and independent lifelong learning ability;

(5) Have good expression skills and international vision.

### 三、毕业要求

### ‖‖ Graduation Requirements

本专业毕业生应系统地掌握坚实的理论和专业知识，具有较强的分析问题和解决问题的能力，能够适应社会发展的需要，具有在自动化相关领域从事技术开发、管理、维护、教学和科学研究工作的能力。毕业要求具体体现在以下几个方面：

**1. 工程知识**：能够将数学、自然科学、工程基础和专业知识用于解决自动化专业领域的复杂工程问题；

**2. 问题分析**：能够应用数学、自然科学、工程科学的基本原理，对自动化专业领域的复杂工程问题进行识别与准确描述，并通过文献研究对其进行分析，并获得有效结论；

**3. 设计/开发解决方案**：能够设计针对自动化专业领域的复杂工程问题解决方案，设计满足特定需求的控制系统、控制装置，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；

**4. 研究**：能够基于科学原理并采用科学方法对自动化专业领域的复杂工程问题，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；

**5. 使用现代工具**：能够针对自动化专业领域的复杂工程问题，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；

**6. 工程与社会**：能够基于工程相关背景知识进行合理性分析，评价自动化专业工程实践和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；

**7. 环境和可持续发展**：能够理解和评价针对自动化专业领域的复杂工程问题的专业工程实践对环境、社会可持续发展的影响；

**8. 职业规范**：具有人文社会素养、社会责任感，能够在自动化工程实践中理解并遵守工程职业道德和规范，履行责任；

**9. 个人和团队**：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色；

**10. 沟通**：能够就自动化专业领域的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；

**11. 项目管理**：理解并掌握自动化工程管理原理与经济决策方法，并能在多学科环境中应用；

**12. 终身学习**：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。

The specialty graduates can systematically grasp firm theory and professional knowledge, and they must have the abilities of analyzing and dealing with problems to fit in with the needs of the society. They can be engaged in developing, managing, maintaining, teaching and investigating work in automation fields. The following represents these concretely.

**1. Engineering knowledge:** Be able to apply mathematics, natural sciences, engineering and automation expertise to solve the automation applications in the field of complex engineering problems.

**2. Problem analysis:** Be able to apply the basic principles of mathematics, natural sciences and engineering science to identify and express, and analysis of complex engineering problems in automation applications through the literature research in order to obtain effective conclusions.

**3. Design / development solutions:** Design solutions for complex engineering problems in automation applications, design and develop hardware/software and network systems, components and products that meet specific needs, and reflect innovation in design and development taking into account economic, security, legal, ethical, environmental and cultural factors.

**4. Research:** Based on the principles of automation, be able to use scientific methods to study the complex engineering problems in automation, including design experiments, analysis and interpretation of data. and acquire reasonable and effective conclusions through information synthesis.

**5. Use modern tools:** Be able to develop, select and use appropriate platforms, technologies, resources, modern engineering tools and information technology tools for complex problems in automation applications, including predictions and simulations of complex engineering problems and the ability to understand its limitations

**6. Engineering and Society:** Be able to conduct rational analysis based on engineering-related background knowledge, evaluate the impact of automation engineering practice and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities that should be borne.

**7. Environment and sustainable development:** Be able to understand and evaluate the practical activities of complex automation engineering problems, and the impact on the environment, social sustainable development.

**8. Professional norms:** Process humanities and social sciences, civic moral standards and social responsibility. And fulfill their responsibilities in automation engineering practice to understand and comply with engineering ethics and norms.

**9. Individuals and teams:** Process a strong physique and good overall quality, be able to assume the individual, team members and the role of the person in charge in a multi-disciplinary background of the team.

**10. Communication:** Process the ability, method and skill to communicate, to communicate with the industry peers and the public on complex engineering issues in automation applications, including writing reports and designing manuscripts, statements, clarity and defense. And have a certain international perspective, to communicate and exchange under cross cultural background.

**11. Project management:** Process a certain degree of project management knowledge and ability to understand and master the principles of automation engineering management and economic decision-making methods, and can be applied in a multi-disciplinary environment.

**12. Lifelong learning:** Process a certain degree of independent learning and lifelong learning awareness, have the ability to continue and independent learning to learn to adapt the development of economic and social innovation.

## 四、主干学科及核心课程

### Ⅳ Main Discipline & Core Courses

主干学科：控制科学与工程、电气工程、计算机科学与技术。

主要课程：自动控制理论 A1、过程控制系统（模块一）、运动控制系统（模块二）、现代控制理论、电力电子技术基础、计算机控制技术 B、微机原理与接口技术、检测与转换技术、电机与拖动、工业机器人基础及应用技术（模块一）、工业物联网技术及应用（模块二）等。

Main Discipline：Control Science and Engineering, Electrical Engineering, Computer Science and Technology.

Core Courses：Automatic Control Theory A1, Process Control Systems (Classification I), Motion Control Systems (Classification II), Modern Control Theory, Digital Electronics Technology, Computer Control Technology B, Principles and Interface of Microcomputer, Detection and Conversion Technology, Machines and Drives, The Foundation and Application Of Industrial Robot Technology (Classification I), Technology and Application of Industrial Internet of Things (Classification II), etc.

## 五、学制及学位

### V Program Duration and Academic Degrees

学制：4 年

学习年限：3-6 年

授予学位：工学学士

Program Duration：Four years

Period of schooling：3-6 years

Degree Granted：Bachelor of Engineering

## 六、最低毕业学分要求

### VI Minimum Required Credits

| 课程平台、模块及类型<br>Education courses、module and category | | 学分<br>Credit | 占总学分比例(%)<br>Proportion of credit(%) |
|---|---|---|---|
| 通识教育课程平台<br>General education courses | 课堂教学<br>Coursework | 41.5 | 23.06 |
| | 实验和课程实践<br>Experiments & practicum | 5.5 | 3.05 |

| 基础教育课程平台<br>Basic education courses | | 课堂教学<br>Coursework | | 61.5 | 34.17 |
|---|---|---|---|---|---|
| | | 实验和课程实践<br>Experiments & practicum | | 6.5 | 3.61 |
| 专业教育课程平台<br>Specialized courses | 必修课程<br>Compulsory course | 课堂教学<br>Coursework | | 9.5 | 5.28 |
| | | 实验和课程实践<br>Experiments & practicum | | 2.5 | 1.39 |
| | 选修课程<br>Elective course | 课堂教学<br>Coursework | | 8 | 4.44 |
| | | 实验和课程实践<br>Experiments & practicum | | 0 | 0 |
| 实践教育环节平台<br>Practicum | | 专业基础实践<br>Basic practicum | | 9 | 5 |
| | | 专业综合实践<br>Professional practicum | | 27 | 15 |
| | | 素质教育实践<br>Quality education practicum | | 9 | 5 |
| 合　计 Total | | | | 180 | |

# 七、课程设置及教学
## VII Curriculum

### （一）通识教育课程平台
### （一）General education courses

| 课程模块<br>Classification | 模块性质<br>Category | 课程名称<br>Course name | 学分<br>credit | 学时分配<br>Time distribution | | | | 考试考查<br>Exam type | 建议修读学期<br>Suggested term | 开课单位<br>course-offering faculty |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 总学时<br>Total hrs | 理论<br>Class hours | 实验<br>experiments | 课程实践<br>practicum | | | |
| 思想政治<br>Ideological politics | 必修<br>Compulsory courses | 思想道德修养与法律基础<br>Morals, Ethics and Fundamentals of Law | 3 | 48 | 40 | | 8 | 考查 | 1 | 马院 |
| | | 毛泽东思想和中国特色社会主义理论体系概论<br>Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | 6 | 96 | 64 | | 32 | 考试 | 5 | 马院 |
| | | 马克思主义基本原理<br>Marxism Philosophy | 3 | 48 | 40 | | 8 | 考试 | 1 | 马院 |
| | | 中国近现代史纲要<br>Outline of Contemporary and Modern Chinese History | 2 | 32 | 24 | | 8 | 考查 | 3 | 马院 |
| | | 形势与政策（1）<br>Situation and Policy(1) | 0.5 | 32 | 16 | | 16 | 考查 | 2 | 马院 |
| | | 形势与政策（2）<br>Situation and Policy(2) | 0.5 | 32 | 16 | | 16 | 考查 | 4 | 马院 |
| | | 形势与政策（3）<br>Situation and Policy(3) | 0.5 | 32 | 16 | | 16 | 考查 | 6 | 马院 |
| | | 形势与政策（4）<br>Situation and Policy(4) | 0.5 | 32 | 16 | | 16 | 考查 | 8 | 马院 |

| 课程模块<br>Classification | 模块性质<br>Category | 课程性质 | 课程名称<br>Course name | 学分<br>credit | 学时分配<br>Time distribution | | | | 考试/考查<br>Exam type | 建议修读学期<br>Suggested term | 开课单位<br>course-offering faculty |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时<br>Total hrs | 理论<br>Class hours | experiments<br>实验 | 课程实践<br>practicum | | | |
| 外语<br>Foreign Languages | | | 大学英语 B(1)<br>College English B(1) | 3 | 48 | 48 | | | 考试 | 1 | 外语 |
| | | | 大学英语 B(2)<br>College English B(2) | 4 | 64 | 48 | | 16 | 考查 | 2 | 外语 |
| | | | 大学英语 B(3)<br>College English B(3) | 3 | 48 | 40 | | 8 | 考查 | 3 | 外语 |
| | | | 大学英语 B(4)<br>College English B(4) | 2 | 32 | 32 | | | 考试 | 4 | 外语 |
| 体育<br>Sports | | | 体育(1)<br>Physical Education(1) | 1 | 36 | 32 | | 4 | 考查 | 1 | 体育 |
| | | | 体育(2)<br>Physical Education(2) | 1 | 36 | 32 | | 4 | 考查 | 2 | 体育 |
| | | | 体育(3)<br>Physical Education(3) | 1 | 36 | 32 | | 4 | 考查 | 3 | 体育 |
| | | | 体育(4)<br>Physical Education(4) | 1 | 36 | 32 | | 4 | 考查 | 4 | 体育 |
| 信息技术<br>Information technology | | 必修 Compulsory courses | 大学计算机基础 A<br>Foundation of Computer A | 1 | 32 | 16 | 16 | | 考查 | 1 | 信工 |
| 国防教育<br>National Defense Education | | | 军事理论<br>Military Theory | 2 | 32 | 32 | | | 考查 | 2 | 体育 |
| 素质教育<br>Quality education | 选修 Elective Courses | | 人文社科类<br>Humanity and social science | 4 | 所有学生必修心理健康类、创新创业类、就业指导类、艺术教育类课程每类必须至少 2 学分，必修人文社科类或自然科学类课程必须至少 4 学分。<br>All the students are required to achieve at least two credits of mental health, innovation, career guidance or art courses.The minimum of four credits are required in the courses of arts or natural science. | | | | | | |
| | | | 自然科学类<br>Nature Science Courses | | | | | | | | |
| | | | 艺术教育类<br>Arts Courses | 2 | | | | | | | |
| | | | 就业指导类<br>Career Guidance Courses | 2 | | | | | | | |
| | | | 创新创业类<br>Innovation Courses | 2 | | | | | | | |
| | | | 心理健康类<br>Mental Health Course | 2 | | | | | | | |
| 小 计 Subtotal | | | | 47 | | | | | | | |

## （二）基础教育课程平台

## （二）Basic education courses

| 课程模块 Classification | 模块性质 Category | 课程名称 Course name | 学分 Credit | 学时分配 Time distribution | | | | 考试/考查 Exam type | 建议修读学期 Suggested term | 开课单位 Course-offering faculty |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 总学时 Total hrs | 理论 Class hours | 实验 Experiments | 实践 Practicum | | | |
| 基础教育课程 Basic disciplinary courses | 必修 Compulsory courses | 高等数学 A(1) Advanced Mathematics A (1) | 5 | 80 | 80 | | | 考试 | 1 | 数统 |
| | | 高等数学 A(2) Advanced Mathematics A (2) | 5.5 | 88 | 88 | | | 考试 | 2 | 数统 |
| | | 线性代数 A Linear Algebra | 3 | 48 | 48 | | | 考试 | 3 | 数统 |
| | | 大学物理 A(1) College Physics A (1) | 3.5 | 56 | 56 | | | 考试 | 2 | 物理 |
| | | 大学物理 A(2) College Physics A (2) | 3.5 | 56 | 56 | | | 考试 | 3 | 物理 |
| | | 实验物理 A（1） Experimental Physics A1 | 0.5 | 16 | | 16 | | 考查 | 2 | 物理 |
| | | 实验物理 A（2） Experimental Physics A2 | 1 | 32 | | 32 | | 考查 | 3 | 物理 |
| | | 复变函数与积分变换 Functions of Complex Variables and Integral Transformations | 2.5 | 40 | 40 | | | 考试 | 3 | 数统 |
| | | 概率与数理统计 B Probability and Statistics B | 3.5 | 56 | 56 | | | 考试 | 4 | 数统 |
| | | C 语言程序设计 B C Language Programming B | 2.5 | 56 | 32 | 24 | | 考查 | 1 | 信工 |
| | | 工程图学 C Engineering Graphics C | 3.5 | 56 | 56 | | | 考查 | 1 | 机电 |
| | | 电路 B Circuit B | 4.5 | 80 | 64 | 16 | | 考试 | 2 | 电气 |
| | | 模拟电子技术 A Analog Electronics Technology A | 3.5 | 56 | 56 | | | 考试 | 4 | 信工 |
| | | 数字电子技术 A Digital Electronics Technology A | 3 | 48 | 48 | | | 考试 | 4 | 信工 |
| | | 电子技术实验 Electronics Technology Experiments. | 0.5 | 28 | | 28 | | 考查 | 4 | 电气 |
| | | 微机原理与接口技术 A Principles and Interface of Microcomputer A | 3 | 48 | 40 | 8 | | 考试 | 5 | 信工 |
| | | 单片机原理及应用 A Theories and Applications of Single Chip Microcomputer A | 2 | 40 | 24 | 16 | | 考查 | 4 | 信工 |
| | | 自动控制理论 A1 Automatic Control Theory A1 | 4.5 | 72 | 64 | 8 | | 考试 | 5 | 信工 |
| | | 控制系统的计算机辅助分析 A Computer Aided Analysis of Control Systems A | 1.5 | 32 | 16 | 16 | | 考查 | 5 | 信工 |
| | | 检测与转换技术 Detection and Conversion Technology | 2.5 | 40 | 32 | 8 | | 考查 | 5 | 信工 |
| | | 电力电子技术基础 Power Electronic Technology | 3 | 48 | 40 | 8 | | 考试 | 5 | 信工 |

| | | 现代控制理论<br>Modern Control Theory | 2 | 32 | 32 | | | 考查 | 6 | 信工 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 电机与拖动<br>Electrical Machines and Drives | 4 | 64 | 56 | 8 | | 考试 | 4 | 信工 |
| | | 小　计 Total | 68 | 1172 | 984 | 188 | | | | |

# （三）专业教育课程平台

# （三）Specialized courses

| 课程模块<br>Classification | 模块性质<br>Category | 课程名称<br>Course Name | 学分<br>credit | 学时分配<br>Time distribution | | | | 考试/考查<br>Exam type | 建议修读学期<br>Suggested term | course-offering faculty<br>开课单位 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 总学时<br>Total hrs | 理论<br>Class hours | 实验<br>experiments | 课程实践<br>practicum | | | |
| 工程能力培养模块一<br>Engineering ability training module I | 必修<br>Compulsory courses | 计算机控制技术 B<br>Computer Control Technology B | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| | | 运动控制系统<br>Motion Control Systems | 3 | 56 | 40 | 16 | | 考试 | 6 | 信工 |
| | | DSP 技术及应用<br>DSP Technology and Applications | 2.5 | 48 | 32 | 16 | | 考查 | 6 | 信工 |
| | | 可编程逻辑控制器<br>Programmable Logic Controller | 2.5 | 48 | 32 | 16 | | 考查 | 5 | 信工 |
| | | 工业机器人基础及应用技术<br>The Foundation and Application Of Industrial Robot Technology | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| | | 小　计 Subtotal | 12 | 232 | 152 | 80 | | | | |
| 工程能力培养模块二<br>Engineering ability training module II | 必修<br>Compulsory courses | 计算机控制技术 B<br>Computer Control Technology B | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| | | 过程控制系统<br>Process Control Systems | 3 | 56 | 40 | 16 | | 考试 | 6 | 信工 |
| | | 嵌入式系统<br>Embedded System | 2.5 | 48 | 32 | 16 | | 考查 | 6 | 信工 |
| | | 虚拟仪器与检测技术<br>Virtual Instrument and Detection Technology | 2.5 | 56 | 32 | 24 | | 考查 | 5 | 信工 |
| | | 工业物联网技术及应用<br>Technology and Application of Industrial Internet of Things | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| | | 小　计 Subtotal | 12 | 240 | 152 | 88 | | | | |
| 应用类模块<br>Application Class Modules | 选修<br>Elective courses | 面向对象程序设计<br>Object-Oriented Programming | 2 | 40 | 24 | 16 | | 考查 | 3 | 信工 |
| | | FPGA 设计及应用<br>Field－Programmable Gate Array Design and Application | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| | | 飞行控制系统<br>Flight Control Systems | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| | | 机器视觉<br>Machine Vision | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| | | 工业控制网络 A<br>Industrial Control Networks A | 2 | 40 | 24 | 16 | | 考查 | 7 | 信工 |

| 课程模块<br>Classification | 模块性质<br>Category | 课 程 名 称<br>Course Name | 学分<br>credit | 学时分配<br>Time distribution | | | | 考试考查<br>Exam type | 建议修读学期<br>Suggested term | 开课单位<br>course-offering faculty |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 总学时<br>Total hs | 理论<br>Class hours | 实验<br>experiments | 课程实践<br>practicum | | | |
| | | 科技应用英语<br>Applied English for Science and Technology | 2 | 32 | 32 | | | 考查 | 6 | 外语 |
| | | 小 计 Subtotal | 12 | 232 | 152 | 80 | | | | |
| 学 术 类 模 块<br>Academic Class Modules | 选 修<br>Elective courses | 数字信号处理 B（限选）<br>Digital Signal Processing B | 2 | 32 | 24 | 8 | | 考查 | 6 | 信工 |
| | | 高级专门英语<br>Advanced Special English | 2 | 32 | 32 | | | 考查 | 6 | 外语 |
| | | 自动控制理论 A2<br>Automatic Control Theory A2 | 2 | 32 | 32 | | | 考试 | 6 | 信工 |
| | | 模式识别<br>Pattern Recognition | 2 | 32 | 24 | 8 | | 考查 | 6 | 信工 |
| | | 软件技术基础<br>The Basis of Software Technology | 2 | 32 | 24 | 8 | | 考查 | 4 | 信工 |
| | | 专业前沿技术<br>Professional Frontier Technology | 2 | 32 | 32 | | | 考查 | 7 | 信工 |
| | | 小 计 Subtotal | 12 | 192 | 168 | 24 | | | | |

备注：工程能力培养模块一和工程能力培养模块二，必须修完其中一模块；学术类模块和应用类模块不要求修完某一模块，可以两个模块的课程兼修，所修学分不少于 8 学分；科技应用英语和高级专门英语，必修其中一门，不可两门同修。

Note: One of the engineering capacity training module 1 and the engineering capacity training module 2 must be completed; Academic modules and application modules do not require the completion of a module, but can be taught concurrently in the modules and no less than 8 credits are required; Applied English for Science and Technology and Advanced Specialized English, one of the courses is compulsory, but not both.

## （四）实践教育环节平台

## （四）Practicum

| 实践模块<br>Classification | 模块性质<br>Category | 实 践 环 节 名 称<br>Practicum Name | 实践环节性质<br>Type | 学 分<br>Credit | 周 数<br>Weeks | 建议学期<br>Suggested Term | 开课单位<br>Course-offering Faculty |
|---|---|---|---|---|---|---|---|
| 专 业 基 础 实 践<br>Basic Practicum | 必 修<br>Compulsory courses | 工程实训 D<br>Engineering Technologies Training D | 实训 | 2 | 2 | 2 | 工训 |
| | | C 语言课程设计<br>C Programming Comprehensive Training | 课程设计 | 1 | 1 | 2 | 信工 |
| | | 认识实习<br>Cognition Practice | 实习 | 1 | 1 | 3 | 信工 |
| | | 电工电子实训<br>Electrical and Electronic Practice | 实训 | 1 | 1 | 4 | 工训 |
| | | 电子 EDA 技术<br>Electronic Design Automation Course Design | 课程设计 | 2 | 2 | 4 | 信工 |

| 实践模块<br>Classification | 模块性质<br>Category | 实践环节名称<br>Practicum Name | 实践环节性质<br>Type | 学分<br>Credit | 周数<br>Weeks | 建议学期<br>Suggested Term | 开课单位<br>Course-offering Faculty |
|---|---|---|---|---|---|---|---|
| | | 自动控制原理课程设计<br>Automatic Control Theory Course Design | 课程设计 | 1 | 1 | 5 | 信工 |
| | | 电力电子技术课程设计<br>Power Electronic Technology Course Design | 课程设计 | 1 | 1 | 5 | 信工 |
| | | 小 计 Subtotal | | 9 | | | |
| 专业综合实践（工程能力培养模块一）<br>Professional Practicum | 必修<br>Compulsory courses | 工业机器人技术课程设计<br>Industrial RobotTechnology Course Design | 课程设计 | 2 | 2 | 7 | 信工 |
| | | 专业综合课程设计 I (控制系统应用)<br>Specialty Comprehensive Course Design I (Control System Application) | 课程设计 | 3 | 3 | 6 | 企业 |
| | | 专业综合课程设计 II (电子工程应用)<br>Specialty Comprehensive Course Design II (Electronic Engineering Application) | 课程设计 | 3 | 3 | 6 | 企业 |
| | | 生产实习<br>Productive Practice | 实习 | 4 | 4 | 7 | 企业 |
| | | 毕业设计<br>Graduation Project | 毕业设计（论文） | 15 | 15 | 8 | 信工 |
| | | 小 计 Subtotal | | 27 | | | |
| 专业综合实践（工程能力培养模块二）<br>Professional Practicum | 必修<br>Compulsory courses | 工业物联网技术课程设计<br>Industrial Internet of Things Technology Course Design | 课程设计 | 2 | 2 | 7 | 信工 |
| | | 专业综合课程设计 I (控制系统应用)<br>Specialty Comprehensive Course Design I (Control System Application) | 课程设计 | 3 | 3 | 6 | 企业 |
| | | 专业综合课程设计 II (电子工程应用)<br>Specialty Comprehensive Course Design II (Electronic Engineering Application) | 课程设计 | 3 | 3 | 6 | 企业 |
| | | 生产实习<br>Productive Practice | 实习 | 4 | 4 | 7 | 企业 |
| | | 毕业设计<br>Graduation Project | 毕业设计（论文） | 15 | 15 | 8 | 信工 |
| | | 小 计 Subtotal | | 27 | | | |
| 素质教育实践<br>Quality Education Practicum | 必修<br>Compulsory courses | 新生入学教育(含安全教育)<br>New Students Enrolment Education(Include Safety Education) | 实训 | 1 | 1 | 1 | 学生处 |
| | | 军事技能训练<br>Military Skills Training | 实训 | 2 | 2 | 1 | 学生处 |

| 实践模块<br>Classification | 模块性质<br>Category | 实 践 环 节 名 称<br>Practicum Name | 实践<br>环节<br>性质<br>Type | 学 分<br>Credit | 周 数<br>Weeks | 建议学期<br>Suggested<br>Term | 开课单位<br>Course-offering<br>Faculty |
|---|---|---|---|---|---|---|---|
| | | 创新创业实践<br>Innovation and Entrepreneurship Practice | 实训 | 2 | | | 信工 |
| | | 其它课外素质培养实践<br>Other Extra-curriculum Quality Training Practice | 实训 | 4 | | | 学生处 |
| | | 小 计 Subtotal | | 9 | | | |
| 小 计 Total | | | | 45 | | | |

## 八、指导性修读建议计划表

## VIII Instructional Course Schedule

| 第一学期 First Term | | | 第二学期 Second Term | | |
|---|---|---|---|---|---|
| 课程编码<br>Course Code | 课程名称<br>Course Name | 学分<br>Credit | 课程编码<br>Course Code | 课程名称<br>Course Name | 学分<br>Credit |
| 2611003 | 思想道德修养与法律基础<br>Morals, Ethics and Fundamentals of Law | 3 | 2611004 | 形势与政策（1）<br>Situation and Policy(1) | 0.5 |
| 2611001 | 马克思主义基本原理<br>Marxism Philosophy | 3 | 0711005 | 大学英语 B(2)<br>College English B(2) | 4 |
| 0711002 | 大学英语 B(1)<br>College English B(1) | 3 | 1111002 | 体育(2)<br>Physical Education(2) | 1 |
| 1111001 | 体育(1)<br>Physical Education(1) | 1 | 1111003 | 军事理论<br>Military Theory | 2 |
| 1012002 | 高等数学 A(1)<br>Advanced Mathematics A（1） | 3 | 1012012 | 高等数学 A(2)<br>Advanced Mathematics A (2) | 5.5 |
| 0411001 | 大学计算机基础 A<br>Foundation of Computer A | 1 | 2812010 | 大学物理 A(1)<br>College Physics A (1) | 3.5 |
| 0412001 | C 语言程序设计 B<br>C Language Programming B | 1 | 2812017 | 实验物理 A（1）<br>Experimental Physics A1 | 0.5 |
| 0112003 | 工程图学 C<br>Engineering Graphics C | 3 | 3112004 | 电路 B<br>Circuit B | 4.5 |
| 2114002 | 新生入学教育（含安全教育）<br>New Students Enrolment Education（Include Safety Education） | 1 | 2214001 | 工程实训 D<br>Engineering Technologies raining | 2 |
| 2114001 | 军事技能训练<br>Military Skills Training | 2 | 0414001 | C 语言课程设计<br>C Programming Comprehensive Training | 1 |
| 合 计 Total | 必修 21 学分<br>Credits of required courses: 21 | | 合 计 Total | 必修 24.5 学分<br>Credits of required courses: 24.5 | |
| * 本学期选课具体要求 Specific requirements of choosing courses for the term<br>* 本学期总学分 21 学分 Total credits: 21 | | | * 本学期选课具体要求 Specific requirements of choosing courses for the term<br>* 本学期总学分 24.5 学分 Total credits: 24.5 | | |

| 第三学期 Third Terms | 第四学期 Fourth Term |
|---|---|
| | |

| 第三学期 Third Terms | | | 第四学期 Fourth Term | | |
|---|---|---|---|---|---|
| 课程编码<br>Course Code | 课程名称<br>Course Name | 学分<br>Credit | 课程编码<br>Course Code | 课程名称<br>Course Name | 学分<br>Credit |
| 2611005 | 中国近现代史纲要<br>Outline of Contemporary and Modern Chinese History | 2 | 2611006 | 形势与政策（2）<br>Situation and Policy(2) | 0.5 |
| 0711006 | 大学英语 B(3)<br>College English B(3) | 3 | 0711007 | 大学英语 B(4)<br>College English B(4) | 2 |
| 1111004 | 体育(3)<br>Physical Education(3) | 1 | 1111005 | 体育(4)<br>Physical Education(4) | 1 |
| 1012017 | 线性代数 A<br>Linear Algebra | 3 | 1012027 | 概率与数理统计 B<br>Probability and Statistics B | 3.5 |
| 2812022 | 大学物理 A(2)<br>College Physics A (2) | 3.5 | 0412034 | 模拟电子技术 A<br>Analog Electronics Technology A | 3.5 |
| 2812040 | 实验物理 A（2）<br>Experimental Physics A2 | 1 | 0412035 | 数字电子技术 A<br>Digital Electronics Technology A | 3 |
| 1012010 | 复变函数与积分变换<br>Functions of Complex Variables and Integral Transformations | 2.5 | 3112019 | 电子技术实验<br>Electronics Technology Experiments. | 0.5 |
| 0413034 | 面向对象程序设计<br>Object-Oriented Programming | 2 | 0412016 | 电机与拖动<br>Electrical Machines and Drives | 4 |
| 0414018 | 认识实习<br>Cognition Practice | 1 | 0413011 | 单片机原理及应用 A<br>Theories and Applications of Single Chip Microcomputer A | 2 |
| | | | 0413044 | 软件技术基础<br>The Basis of Software Technology | 2 |
| | | | 2214005 | 电工电子实训<br>Electrical and Electronic Practice | 1 |
| | | | 0414034 | 电子 EDA 技术<br>Electronic Design Automation Course Design | 2 |
| 合 计 Total | 必修 17 学分<br>Credits of required courses:17 | | 合 计 Total | 必修 23 学分<br>Credits of required courses: 23 | |

\* 本学期选课具体要求 Specific requirements of choosing courses for the term
\* 本学期总学分 19 学分 Total credits:19

\* 本学期选课具体要求 Specific requirements of choosing courses for the term
\* 本学期总学分 25 学分 Total credits:25

| 第五学期 Fifth Terms | | | 第六学期 Sixth Term | | |
|---|---|---|---|---|---|
| 课程编码<br>Course Code | 课程名称<br>Course Name | 学分<br>Credit | 课程编码<br>Course Code | 课程名称<br>Course Name | 学分<br>Credit |
| 2611002 | 毛泽东思想和中国特色社会主义理论体系概论<br>Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | 6 | 2611007 | 形势与政策（3）<br>Situation and Policy(3) | 0.5 |
| 0412029 | 微机原理与接口技术 A<br>Principles and Interface of Microcomputer A | 3 | 041230 | 现代控制理论<br>Modern Control Theory | 2 |
| 0412032 | 自动控制理论 A1<br>Automatic Control Theory A1 | 4.5 | 0413074 | 运动控制系统<br>Motion Control Systems | 3 |
| 0413032 | 控制系统的计算机辅助分析 A<br>Computer Aided of Control Systems A | 1.5 | 0413024 | 过程控制系统<br>Process Control Sys0tems | 3 |
| 0412022 | 检测与转换技术<br>Detection and Conversion Technology | 2.5 | 0413028 | 计算机控制技术 B<br>Computer Control Technology | 2 |
| 0412017 | 电力电子技术基础 | 3 | 0413001 | DSP 技术及应用 | 2.5 |

| 第五学期 Fifth Terms | | | 第六学期 Sixth Term | | |
|---|---|---|---|---|---|
| | Power Electronic Technology | | | DSP Technology and Applications | |
| 0413027 | 可编程逻辑控制器 Programmable Logic Controller | 2.5 | 0413039 | 嵌入式系统 Embedded System | 2.5 |
| 0413070 | 虚拟仪器与检测技术 Virtual Instrument and Detection Technology | 2.5 | 0413018 | 工业机器人基础及应用技术 The Foundation and Application Of Industrial Robot Technology | 2 |
| 暂无编号 | 自动控制原理课程设计 Automatic Control Theory Course Design | 1 | 0413022 | 工业物联网技术及应用 Technology and Application of Industrial Internet of Things | 2 |
| 暂无编号 | 电力电子技术课程设计 Power Electronic Technology Course Design | 1 | 0453021 | 数字信号处理 B Digital Signal Processing B | 2 |
| | | | 0413003 | FPGA 设计及应用 Field－Programmable Gate Array Design and Application | 2.5 |
| | | | 0413015 | 飞行控制系统 Flight Control Systems | 2 |
| | | | 0713002 | 科技应用英语 Applied English for Science and Technology | 2 |
| | | | 0713001 | 高级专门英语 Advanced Special English | 2 |
| | | | 0413080 | 自动控制理论 A2 Automatic Control Theory A2 | 2 |
| | | | 0413026 | 机器视觉 Machine Vision | 2 |
| | | | 0413038 | 模式识别 Pattern Recognition | 2 |
| | | | 0414025 | 专业综合课程设计 I(控制系统应用) Specialty Comprehensive Course Design I (Control System Application) | 3 |
| | | | 0414026 | 专业综合课程设计 II (电子工程应用) Specialty Comprehensive Course Design II (Electronic Engineering Application) | 3 |
| 合 计 Total | 必修 25 学分 Credits of required courses:25 | | 合 计 Total | 必修 20 学分 Credits of required courses:20 | |

* 本学期选课具体要求 Specific requirements of choosing courses for the term
* 本学期总学分 27.5 学分 Total credits:27.5

* 本学期选课具体要求 Specific requirements of choosing courses for the term
* 本学期总学分 42 学分 Total credits:42

| 第七学期 Seventh Terms | | | 第八学期 Eighth Term | | |
|---|---|---|---|---|---|
| 课程编码 Course Code | 课程名称 Course Name | 学分 Credit | 课程编码 Course Code | 课程名称 Course Name | 学分 Credit |
| 0413020 | 工业控制网络 A Industrial Control Networks | 2 | 2611008 | 形势与政策（4） Situation and Policy(4) | 0.5 |
| 0413075 | 专业前沿技术 Professional Frontier Technology | 2 | 0414013 | 毕业设计 Graduation Project | 15 |
| 暂无编号 | 工业机器人技术课程设计 Industrial Robot Technology Course Design | 2 | | | |

| 第七学期 Seventh Terms | | | 第八学期 Eighth Term | | |
|---|---|---|---|---|---|
| 暂无编号 | 工业物联网技术课程设计<br>Industrial Internet of Things Course Design | 2 | | | |
| 0414006 | 生产实习 | 4 | | | |
| 合 计 Total | 必修 6 学分<br>Credits of required courses:6 | | 合 计 Total | 必修 15.5 学分<br>Credits of required courses:15.5 | |
| * 本学期选课具体要求 Specific requirements of choosing courses for the term<br>* 本学期总学分 12 学分 Total credits: 12 | | | * 本学期选课具体要求 Specific requirements of choosing courses for the term<br>* 本学期总学分 15.5 学分 Total credits:15.5 | | |

## 九、辅修专业或双学位课程设置及教学进程

## IX Minor and Double-degree Programs

### （一）自动化辅修专业课程

### （一）Automation Minor Programs

| 课程模块<br>Classification | 模块性质<br>Category | 课程性质 | 课程名称<br>Course Name | 学分<br>credit | 学时分配<br>Time distribution | | | | 考试/考查<br>Exam type | 建议修读学期<br>Suggested term | 开课单位<br>course-offering faculty |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时<br>Total hrs | .理论<br>Class hours | 实验<br>experiments | 课程实践<br>practicum | | | |
| 基础教育课程<br>Basic courses | Compulsory courses | 必修 | 自动控制理论 A1<br>Automatic Control Theory A1 | 4.5 | 72 | 64 | 8 | | 考试 | 5 | 信工 |
| | | | 单片机原理及应用 A<br>Theories and Applications of Single Chip Microcomputer A | 2 | 40 | 24 | 16 | | 考查 | 4 | 信工 |
| 专业教育课程<br>Professional Courses | Compulsory courses | 必修 | 运动控制系统<br>Motion Control Systems | 3 | 56 | 40 | 16 | | 考试 | 6 | 信工 |
| | | | 过程控制系统<br>Process Control Systems | 3 | 56 | 40 | 16 | | 考试 | 6 | 信工 |
| | | | 计算机控制技术 B<br>Computer Control Technology B | 2 | 40 | 24 | 16 | | 考查 | 6 | 信工 |
| 实践教育环节<br>Practicum | Compulsory courses | 必修 | 专业综合课程设计 I (控制系统应用)<br>Specialty Comprehensive Course Design I (Control System Application) | 3 | | | | | | 6 | 校企 |
| | | | 专业综合课程设计 II (电子工程应用)<br>Specialty Comprehensive Course Design II (Electronic Engineering Application) | 3 | | | | | | 6 | 校企 |
| 合 计 Total | | | | 22 | | | | | | | |