

机械电子工程（留学生）专业培养方案

International Undergraduate Program of Mechatronic Engineering

（门类：工学；二级类：机械工程；专业代码：080204）

(Category: Engineering; Sub-category: Mechanical Engineering; Specialty Code: 080204)

一、专业培养目标 Major Training Objectives

机械电子工程专业涉及机械、电子和控制领域多学科交叉，本专业的培养目标是通过对通识教育、专业教学、工程科学教学和工程实践等多个环节，培养机械电子工程领域的高级工程技术人员、优秀研究人员和学者。通过在山东科技大学机械电子工程学院的学习，使学生具有坚实的跨学科工程背景、创新能力以及较强的工程应用能力，培养学生在机械、电子和控制领域的自学、创新、生产组织和管理能力，以支持未来职业发展的需要。

Combined with general education, professional teaching, engineering science education and industrial practice training, the main objectives of this multidisciplinary undergraduate program (mainly covering the fields of machinery, electronics and control) aim to enhance the students' abilities of self-study, innovation, production organization and management so as to support their future career development (e.g., becoming senior engineers and technicians, outstanding researchers and scholars, etc.) due to the solid and interdisciplinary engineering background, the creative inspiration and ability, as well as the strong ability for actual engineering applications.

二、毕业要求 Graduation Requirements

除了一般要求（例如遵守中国政府和山东科技大学相关规定/条例，尊重教师和中国传统/习俗，健康状况等）以外，外国留学生必须具有机械工程、电子控制技术、机电一体化控制技术、计算机技术和信号处理技术领域的知识。在此基础上，还将获得机电一体化产品设计制造，机电一体化设备的监测与控制、企业管理的知识和潜在能力。毕业生应具备以下知识和能力：

1.掌握机械原理、机械设计、工程材料和热处理、电子技术、机电一体化系统、机电传动控制、液压传动与控制的必要知识，具有绘图、设计、计算、测试和设备操作的

基本技能，同时要了解技术标准，相关行业标准和本专业领域的技术发展趋势。

2.具有创新意识，学生应该具有利用所学知识和技术来分析和解决实际工程问题的能力，能够胜任机电产品的设计、开发和生产。

3.除了具有创新和合作精神之外，还要具有管理、表达、人际交往、自主学习等方面的能力。

Besides the general requirements (e.g., abide by the relevant rules/regulations from Chinese government and Shandong University of Science and Technology, respect the faculty and Chinese traditions/customs, be in good health condition, etc.), the students are required to have the knowledge in the field of mechanical engineering, electronic control technology, mechatronic control technology, computer technology and signal processing technology.

On this basis, the potential ability and knowledge of mechatronic products design and manufacturing, controlling and monitoring of mechatronic equipment and enterprise management shall be acquired. Graduates should have the following knowledge and abilities:

1.Master the necessary knowledge of mechanical principle, mechanical design, engineering materials and heat treatment, electronic technology, mechatronic system, mechanical & electronic transmission control, hydraulic transmission and control, and have the basic skills of drawing, design, calculation, test and device operation. They are also required to understand the technical standard, the relevant industry standards and technology trends in this field.

2. With innovation awareness, the students should have the abilities to analyze and solve the actual engineering problems with knowledge and techniques they have acquired so as to be qualified for the design, development and production of mechatronic products.

3.They are required to have the relative abilities of management, expression, interpersonal communication, self-study with innovative inspiration and collaborative spirit.

三、主干学科 Major Disciplines

机械工程、控制科学与工程

Mechanical Engineering, Control Science and Engineering

四、专业核心课程 Specialty Core Courses

高等数学、大学物理、线性代数、概率论与数理统计、计算机程序设计基础（C 语

言)、制图基础、机械制图应用、理论力学、材料力学、电路基础、电子技术、工程流体力学、单片机原理及应用、机械原理、机械设计、机械制造技术基础、几何量公差、机械工程材料与热处理、机械控制基础、传感器与检测技术、液压传动与控制、计算机数控系统、可编程控制器、机电传动控制、机械电子学、机器人技术基础。

Advanced Mathematics, College Physics, Linear Algebra, Probability and Statistics, Foundations of Computer Programming(C Language), Fundamentals of Engineering Drawing, Application of Mechanical Engineering Drawing, Theoretical Mechanics, Material Mechanics, Fundamentals of Electric Circuits, Technology of Electronics, Engineering Fluid Mechanics, Microcontroller, Theory of Machines and Mechanism, Mechanical Design, Fundamentals of Mechanical Manufacturing Technology, Geometric Dimensioning and Tolerancing, Mechanical Engineering Material and Heat Treatment, Control Technology in Mechanical Engineering, Sensor and Detecting Technology, Hydraulic Transmission and Control, PLC Technology, Computer Numerical Control(CNC), Electrical Machines and Drive, Introduction to Mechatronics, Introduction to Robotics: Mechanics and Control.

五、主要实践性教学环节 Main Practical Teaching and Internship

机械原理课程设计、工程实训、单片机原理及应用课程设计、机械设计课程设计、液压传动与控制课程设计、创新实践、生产实习、毕业设计(论文)。

Course Project for Theory of Machines and Mechanism, Engineering Training, Course Project of Microcontroller, Course Project of Mechanical Design, Course Project of Hydraulic Transmission and Control, Innovation Practice, Engineering Internship, Graduation Project/Thesis.

六、学制 Program Duration

四年 Four Years

七、授予学位 Degree to Be Awarded

工学学士 Bachelor of Engineering

八、毕业最低学分要求 Minimum Credit Requirements for Graduation

毕业需达到 160 学分, 其中必修的基础课 44 学分(含课程内实验和上机); 必修的专业基础课和专业课 74 学分; 专业选修课 6 学分; 课程设计、实习和毕业设计等实

践环节 36 学分。

The minimum credit total for graduation is 160: credits for Required General Fundamental Courses, 44 (course experiment and computer practicals are included); credits for Required Specialty Courses, 74; credits for Elective Specialty Courses, 6; credits for Course Project, Internship and Graduation Project, 36.

九、培养方案的构成及时、学分分配

Program Composition and Distribution of Class Hours and Credits

表 1 人才培养方案学分构成表

Table 1 Program Composition and Distribution of Class Hours and Credits

课程类别 Course Classification	课程类型 Course Type	学分数 Credits	学时数（或周数） Hours (or weeks)	占总学 分比例 Credit Percentage
通识教育课 General Education Courses	通识必修课 Required General Education Courses	44	812 学时 812 hours	27.50%
专业核心课 Specialty Core Courses	专业基础课程 Specialty Fundamental Courses	68	1212 学时 1212 hours	42.50%
	专业课 Specialty Courses	6	108 学时 108 hours	3.75%
专业拓展（选修）课 Specialty Extended Courses	—	6	108 学时 108 hours	3.75%
课程合计 Course Total		124	2240 学时 2240 hours	77.50%
实践环节 Practice	实习、课程设计等 Internship, Practical Training, Course Project, etc.	20	20 周 20weeks	12.50%
	毕业设计（论文） Graduation Project (Thesis)	16	16 周 16weeks	10.00%
实践环节合计 Practice Total		36	36 周 36weeks	22.50%

表 2 各学期必修教学环节额定学分分配表

Table 2 Credit Allocation for Required Course in Each Semester

课程类型 Course Type	学期 Semester								学分汇总 Total Credits
	1-1	1-2	2-1	2-2	3-1	3-2	4-1	4-2	
通识必修课 General Compulsory Courses	12	14	12	6	0	0	0	0	44
专业核心课 Specialty Core Courses	3	3	6	14	21	13	14	0	74
实践环节 Internship and Practical Training	0	0	0	6	2	6	6	16	36
学分汇总 Total Credits	15	17	18	26	23	19	20	16	154