

宁波东方理工大学

2026 级智能制造工程本科专业培养方案

Curriculum for the Program of Intelligent Manufacturing Engineering (2026)

Eastern Institute of Technology, Ningbo

一、专业介绍 Introduction to the Program

智能制造工程专业面向国家制造业转型升级战略需求，培养具备多学科交叉能力的拔尖创新人才。本专业授予工学学士学位，修业年限 4 年，依托工学部力学与机械类学科优势，聚焦先进制造、信息技术与人工智能等前沿领域。本专业拥有包含 5 名院士在内的国际一流的师资队伍。核心课程涵盖智能制造工业装备与信息系统、工业机器人、感知技术、机器学习与人工智能等领域，培养学生的工程分析与实践能力。专业特色包括“1+3”通专融合培养模式、本研贯通科研训练及夏季学期实践。本专业配备了高性能计算中心、智能制造展示中心、先进制造中心等，内含完整的教学科研软件与现代化的硬件设备。牵头单位与多家龙头制造企业建立战略合作，毕业生可投身机械、汽车、电子等各种高端制造业的智能化进程，进入科研院所从事技术研发，或进一步深造，攻读硕士、博士学位。

The Program of Intelligent Manufacturing Engineering is designed to address the strategic priorities of China's manufacturing transformation and upgrade, and to cultivate outstanding innovative talents with strong interdisciplinary capabilities. The program awards a four-year Bachelor of Engineering degree. Leveraging the College of Engineering's strong foundation in Mechanics and Mechanical Engineering, the program integrates cutting-edge fields such as Advanced Manufacturing, Information Technology, and Artificial Intelligence. Led by world renowned faculty, including five academicians, the program provides world-class guidance and mentorship. Core courses span Intelligent Manufacturing Systems, Industrial Robots, Sensing Technologies, Machine Learning, and Artificial Intelligence, with a strong emphasis on engineering analysis and practical skills. Distinctive features of the program include a “1+3” general-to-specialty integrated training model, seamless undergraduate-to-graduate research pathways, and enriched summer internships. Students are expected to benefit from the support of a state-of-the-art high-performance computing center and an advanced manufacturing center, both equipped with comprehensive teaching and research software as well as advanced hardware. The program has established strong industrial partnerships with leading manufacturing enterprises, providing graduates with diverse pathways to success. Graduates are well-positioned to drive the AI transformation of high-end industries such as machinery, automotive, and electronics, to advance technical R&D in research institutions, or to pursue graduate programs at top universities.

二、培养目标 Program Objective

本专业立足智能制造工程领域，面向国家实现高水平科技自立自强和制造业转型升级战略需求，培养德智体美劳全面发展，系统掌握扎实的数理化信基础、

智能制造工程专业及多学科交叉领域知识，具备工程实践与创新能力、解决智能制造工程领域复杂工程问题能力、思辨能力与创造性思维等关键能力，拥有家国情怀、国际视野、良好职业道德、社会责任感、领导力和追求卓越精神的创新型高素质专门人才。毕业生能够在机械、汽车、电子等制造业相关领域，从事高水平智能制造工程创新、技术研发等核心工作，预期毕业 5 年左右成长为能够解决智能制造工程领域基础理论和关键技术问题、引领智能制造工程发展的技术中坚和创新先锋等高层次人才。具体目标包括：

This program is designed to serve the field of Intelligent Manufacturing and support the national strategic goals of achieving high-level technological self-reliance and advancing the transformation and upgrading of the manufacturing industry. It aims to cultivate innovative, high-caliber professionals with well-rounded development in moral, intellectual, physical, aesthetic, and hands-on competence; a solid foundation in mathematics, physics, chemistry, and information science; disciplinary and interdisciplinary knowledge in Intelligent Manufacturing Engineering; and key capabilities in engineering practice, innovation, solving complex engineering problems in the field of Intelligent Manufacturing Engineering, critical thinking, and creative problem-solving. These graduates will demonstrate a strong sense of national commitment and global vision, professional ethics, social responsibility, leadership, and a commitment to the pursuit of excellence. They shall be well prepared to engage in high-level innovation, technological R&D, and the solution of complex engineering problems in Intelligent Manufacturing Engineering, the AI transformation of high-end manufacturing industries such as machinery, automotive, energy, and semiconductors, as well as research institutions. Graduates are expected to grow, within approximately five years after graduation, into high-level application-oriented professionals who serve as technical backbones or innovation pioneers capable of addressing fundamental theoretical and key technological challenges and driving future developments in Intelligent Manufacturing. Graduates are expected to achieve the following attributes:

1.具备家国情怀、国际视野；拥有良好的职业道德、社会责任感、领导力等人文素养；坚持追求卓越；

Demonstrate a strong sense of national commitment and global vision, with sound professional ethics, social responsibility, and leadership, as well as well-rounded character. Remain committed to the pursuit of excellence.

2.掌握扎实的数理化信基础、智能制造工程专业及多学科交叉领域知识，具有从事高水平智能制造工程创新工作的专业能力，以及解决智能制造工程领域复杂工程问题的能力；

Have a solid foundation in mathematics, physics, chemistry, and information science, along with disciplinary and interdisciplinary knowledge in the field of Intelligent Manufacturing. Demonstrate professional competence to engage in high-level innovative activities and the ability to solve complex engineering problems in the field.

3.具有思辨能力、创造性思维和工程理念，具有良好的表达与沟通能力，具

备团队合作和终身学习能力。

Exhibit critical thinking, creative problem-solving, and engineering awareness, together with strong communication skills, teamwork capabilities, and a lifelong learning mindset and aptitude.

三、培养要求 Graduate Outcomes

1.工程知识：熟练掌握数学、物理、化学和计算机等自然科学和工程科学基础知识，熟练掌握智能制造工程技术知识和实践技能，具备解决智能制造工程领域复杂工程和科学问题的能力。

Science and Engineering Knowledge: Master fundamental knowledge in mathematics, physics, chemistry, and computer science, as well as foundational engineering science. Possess solid engineering knowledge and practical skills related to Intelligent Manufacturing, and demonstrate the ability to identify, analyze, and solve complex scientific and engineering problems in this field.

2.问题分析：能够运用科学原理、工程知识与技能、数学和计算工具、文献调研等途径分析复杂的智能制造工程问题，综合考虑可持续发展的要求，识别关键环节。

Problem Analysis: Apply scientific principles, engineering knowledge and skills, mathematical and computational tools, and literature research to analyze complex engineering problems related to Intelligent Manufacturing, with a comprehensive understanding of sustainability requirements to identify key factors.

3.设计/开发解决方案：能够运用专业知识，综合考虑健康、安全与环境、全生命周期成本与净零碳要求、法律与伦理、社会与文化等因素，设计和开发智能制造工程解决方案来满足特定的系统与流程要求，并体现创新性。

Design/Development of Solutions: Utilize professional knowledge to design and develop solutions for systems and processes related to Intelligent Manufacturing. These solutions should account for health, safety, and environmental considerations, life-cycle cost and net-zero carbon requirements, legal and ethical constraints, and social and cultural factors, while reflecting innovation.

4.研究：能够运用科学原理和科学方法，探索和研究智能制造工程领域中的科学和复杂工程问题，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。

Research: Apply scientific principles and methodologies to investigate complex problems in the field of Intelligent Manufacturing. This includes designing experiments, analyzing and interpreting data, and drawing valid and effective conclusions through the synthesis of information.

5.使用现代工具：能够正确选择现代工程和信息工具来测试、分析、模拟智能制造工程相关的工程系统，研究、解决相关工程和科学问题，了解所选工具的特性和局限性。

Modern Tool Usage: Select and utilize appropriate modern engineering and IT tools to test, analyze, and simulate systems in Intelligent Manufacturing. Understand the features and limitations of the chosen tools while applying them to address relevant engineering and scientific challenges.

6.工程与可持续发展: 在解决智能制造工程领域内的复杂工程问题时,能够运用相关技术和知识分析和评价智能制造工程实践和相关科研对健康、安全、环境、法律以及经济和社会可持续发展的影响,并理解应承担的责任。

Engineering and Sustainable Development: When addressing complex engineering problems in the field of Intelligent Manufacturing, assess and evaluate the impact of engineering practices and research on health, safety, environment, law, and the sustainable development of the economy and society. Understand and undertake the corresponding responsibilities.

7.工程伦理和职业规范: 自觉践行社会主义核心价值观,树立正确世界观和人生观,有工程报国、为民造福的意识,具有人文社会科学素养和社会责任感。了解智能制造工程相关的政策、法律法规和行业标准,能够理解工程伦理知识、具备工程伦理意识,并践行工程伦理,在工程实践中理解并遵循职业道德、伦理规范和相关法律,恪尽职守。

Engineering Ethics and Professional Norms: Consciously uphold the core socialist values and cultivate a correct worldview and outlook on life. Possess a sense of national service and public welfare, along with a solid foundation in humanities and social sciences and a strong sense of social responsibility. Understand relevant policies, laws, regulations, and industry standards in Engineering demonstrate awareness and understanding of engineering ethics, and apply ethical principles and professional codes in practice.

8.个人和团队: 理解团队合作对于解决复杂工程问题的意义,能够在多样化、多学科背景下的团队中扮演不同角色,协作完成任务,并展现领导力,创建协作包容的工作环境,共同设立目标、制定计划并实现目标。

Individual and Teamwork: Recognize the importance of teamwork in solving complex engineering problems. Be capable of assuming various roles in diverse, interdisciplinary teams, collaborate effectively, demonstrate leadership, and foster an inclusive working environment. Set shared goals, plan strategically, and work towards achieving collective objectives.

9.沟通: 具备国际视野,能够在跨文化背景下就智能制造工程相关学术问题及复杂工程问题与同行及公众进行有效的沟通 and 交流,包括撰写报告、设计文稿、陈述发言等,理解、尊重语言和文化差异。

Communication: Possess a global perspective and communicate effectively with peers and the public on academic and complex engineering issues related to Electronic Science and Technology in cross-cultural contexts. This includes writing reports, designing presentations, delivering oral communications, and appreciating linguistic and cultural diversity.

10.项目管理: 理解并掌握工程项目相关的管理和经济决策的原理和方法,能够对智能制造工程项目进行分析、评估和管理。

Project Management: Understand and apply the principles and methodologies of project management and economic decision-making in engineering projects. Be able to analyze, evaluate, and manage projects related to Intelligent Manufacturing.

11.终身学习: 具有自主学习、终身学习的意识和能力,持续关注并跟进智能制造工程领域的最新发展和前沿动态,汲取新知识,培养新能力,持续提高专业素养,理解技术变革对工程和社会的影响,适应新技术变革。

Lifelong Learning: Demonstrate self-directed and lifelong learning capabilities. Stay informed of the latest advancements and frontiers in Intelligent Manufacturing, continuously acquire new knowledge and skills, enhance professional competence, understand the impact of technological changes on engineering and society, and adapt to new technological developments.

四、培养特色 Program Highlights

人工智能(AI)时代背景下,本专业结合实践教学与AI辅助教学,培养学生的自主学习、知识融通与实践创新能力;顺应机械工程行业的发展趋势,突出数智化专业特色,培养具有思辨能力及国际化视野的拔尖创新人才。具体培养特色包括:

In the era of artificial intelligence (AI), this program integrates hands-on practice with AI-assisted teaching to foster students' abilities in self-directed learning, knowledge integration, and innovative problem-solving. In alignment with the evolving trends in mechanical engineering, the program emphasizes digital intelligence and aims to cultivate top-tier, innovative professionals with critical thinking skills and a global perspective. Key features of the program include:

1.强化通识教育: 全校课程设置采用“1+3”模式,第一学年不分专业,在强化数理化基础和计算能力的同时,强化科技教育与人文教育协同,提高学生创新意识,提升写作与沟通能力;学生在第二学期末开始选择专业,之后进入为期两年的专业培养;第四学年在专业选修课的同时,进行创新实践与毕业设计。

Emphasis on General Education: The university adopts a “1+3” curriculum structure: during the first academic year, students are not assigned to a specific major, enabling them to build a strong foundation in mathematics, physics, chemistry, and computational thinking ability. The program emphasizes a coordinated development of science, technology, and humanities to enhance creativity, writing, and communication skills. Students will select their majors at the end of the second Term and, thereafter, enter two years of specialized study. In the fourth year, students will work on their graduation project while taking major electives.

2.书院制培养: 实行书院制和生活导师制,开展全员、全过程、全方位育人,致力于培养学生的表达与沟通能力、团队协作能力、领导力等综合素质。

Residential College Model: A residential college and mentorship system is in place to support holistic education through all stages of student development. This model aims to cultivate students' communication, teamwork, and leadership abilities,

as well as their overall personal growth.

3.本研贯通：实行学术导师制，强化科研与创新能力培养；鼓励学生及早参与科研创新活动，融合为期一年的本科“创新实践与毕业设计”与科研课题，为学生进入国内外大学攻读硕、博研究生学位提前做好准备，加速急需拔尖人才培养。

Integrated Undergraduate–Graduate Pathways: An academic advisory system is implemented to strengthen research and innovation training. Students are encouraged to participate in research projects early on, with the year-long “Innovation Practice and Graduation Project” closely integrated with faculty-led research. This approach prepares students for advanced study at top universities in China and abroad, and accelerates the development of top-tier innovative professionals in high demand.

4.加强科教实践：促进产教融合，设置夏季学期实践必修课程，鼓励参与夏季学期科研，系统化支持学生进入科研机构、企事业单位等，参与以实践项目为驱动的全过程人才培养。

Enhanced Scientific and Industrial Practice: To promote university-industry collaboration, compulsory summer practice modules are offered. Students are encouraged to participate in research activities during the summer term and are systematically supported in engaging with research institutes, enterprises, and organizations through project-based learning experiences.

5.国际化培养：发挥国际化师资优势，专业课实行双语教学，支持学生赴世界一流大学与机构参与国际交流、项目合作，拓宽视野，提升国际竞争力。

Global Competence Development: Leveraging a globally oriented faculty team, the program incorporates bilingual instruction in core courses and supports student participation in international exchanges and collaborative projects at top world institutions, broadening their horizons and enhancing global competitiveness.

6.智能化教育：探索 AI 时代的教学变革，利用智能工具提高知识传授与学习效率；开设人工智能通识课，培养学生利用数字资源和智能工具的自主学习能力。

AI for Education: Explore teaching transformation in the AI era, and enhance teaching and learning efficiency by making use of AI tools; Offer Introduction to AI course, enabling students to develop self-education abilities with digital resources and AI tools.

五、学制和授予学位 Program Duration and Degree Awarded

专业学制：基本学制4年，采用学分制管理，实行弹性学习年限，最多不超过6年。

授予学位：对完成并符合培养方案学位要求的学生，授予工学学士学位。

Program Duration: The standard duration of the program is four years. A credit-based management system is adopted, with maximum 6 years of study.

Degree Awarded: Students who have completed the program and met the degree requirements stipulated in this Program Curriculum will be awarded the Bachelor of Engineering degree.

六、毕业学分要求 Credit Requirements for Graduation

毕业最低学分要求为 154 学分。课程结构要求如下：

A minimum of 154 credits is required for graduation. The curriculum structure is as follows:

课程模块 Module	课程要求 Requirement	课程类别 Category	学分 Credits
通识与基础课程 General Education and Foundational Module (81学分/Credits)	必修 Required	公共通识必修课 General Education Required Courses	41
		理工基础课 Fundamental Science and Engineering Courses	32
	选修 Elective	通识选修课 General Education Elective Courses	8
专业课程 Major-specific Module (53学分/Credits)	必修 Required	学科基础课程 Discipline-Specific Foundational Module	25
	必修 Required	专业核心课 Major Core Courses	18
	选修 Elective	专业选修课 Major Elective Courses	10
集中实践环节 Intensive Practical Training Module (20学分/Credits)	必修 Required	夏季学期实践 Internship	12 (24周/Weeks)
		创新实践与毕业设计 Capstone Design Project	8 (32周/Weeks)
毕业学分要求 Graduation Credits Requirement			154

基于国标要求的各指标如下：Credit Distribution according to the National Standard

课程类别 Category	学分 Credits	所占比 Percentage (%)	国标要求 National Standard (%)
人文社会科学类课程 Humanities and Social Sciences Module	41	26.6%	15%
数学和自然科学类课程 Mathematics and Natural Sciences Module	32	20.8%	15%
实践性环节 Practical Training Module	49.5	32.1%	20%
学科基础知识和专业知识课程 Discipline-specific Foundational Module and Major Specialization Module	53	34.4%	30%

注：上表中，实践性环节学分未包含专业选修课实践学分。

The credit for the practical training module excludes practical credits from major elective courses.

七、主要课程设置 Core Courses

先进制造基础、测量感知与数据处理、工业人工智能、智能制造工业装备系统、智能制造工业信息系统、工业机器人。

Fundamentals of Advanced Manufacturing, Measuring Sensing and Data Processing, Industrial Artificial Intelligence, Intelligent Manufacturing Equipment Systems, Intelligent Manufacturing Information Systems, and Industrial Robots.

八、主要实践性教学环节和主要专业实验

Practical Training Activities and Major Experiments

主要实践性教学环节包括：夏季学期认知实践、专业实践和创新实践，第四学年全年创新实践与毕业设计，以及各类国内外本科生学术竞赛、创新大赛等。另外，本科生入学即选择学术导师团队，及早参与科研，期间可以选择与夏季学期实践、第四学年创新项目相融合。

Practical Training Activities: Summer Internship I, Summer Internship II, Summer Internship III, Capstone Project, and Undergraduate Academic Competitions. Undergraduates join faculty mentors upon enrollment for early research exposure, which can be integrated with summer Internship and Capstone Project.

主要专业实验包括在以下的课程中：工程材料、工程图学与计算机制图、电工电子技术、热力学与传热学基础、机械原理与机械设计、自动控制原理、先进制造基础、测量感知与数据处理、工业机器人。

Courses that contain experiments: Engineering Materials, Engineering Drawing and Computer-aided Designs, Electrical and Electronic Engineering, Fundamentals of Thermodynamics and Heat Transfer, Principles and Designs of Machinery, Control Theory, Fundamentals of Advanced Manufacturing, Measuring Sensing and Data Processing, and Industrial Robots.

详细内容请参见附表一。

For details, please refer to Appendix Table 1.

九、课程设置与要求 Course Structure and Requirements

（一）通识与基础课程 General Education and Foundational Module

1. 公共通识必修课程 General Education Required Courses

（1）思想政治理论课 Ideological and Political Theory Courses

课程代码 Course Code	课程名称 Course Name	必修选修 Required/ Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
GENE1101	思想道德与法治 Ethics and Rule of Law	必 Required	3	1	3	无 None	1/秋 Y1/Fall
GENE1102	马克思主义基本原理 Basic Principles of Marxism	必 Required	3	1	3	无 None	1/春 Y1/Spring

GENE2101	中国近现代史纲要 Modern Chinese History: A Survey	必 Required	3	1	3	无 None	2/秋 Y2/Fall
GENE2102	毛泽东思想和中国特色社会 主义理论体系概论 Introduction to Maoism and Chinese Socialism	必 Required	2		2	无 None	2/春 Y2/Spring
GENE3101	习近平新时代中国特色社会主义思想概论 Introduction to Xi Thought on Chinese Socialism	必 Required	3	1	3	无 None	3/秋 Y3/Fall
GENE1103	形势与政策I Society and Public Policy in Contemporary China I	必 Required	0.5		0.5	无 None	1/秋 Y1/Fall
GENE1104	形势与政策II Society and Public Policy in Contemporary China II	必 Required	0.5		0.5	无 None	1/春 Y1/Spring
GENE2103	形势与政策III Society and Public Policy in Contemporary China III	必 Required	0.5		0.5	无 None	2/秋 Y2/Fall
GENE2104	形势与政策IV Society and Public Policy in Contemporary China IV	必 Required	0.5		0.5	无 None	2/春 Y2/Spring
GENE3301	思想政治理论课实践 Political Theory and Ideology: Experiential Learning	必 Required	2	2	2	无 None	3/秋 Y3/Fall
GENE3302	劳动教育实践 Practical Labor Education	必 Required	1	1	2	无 None	*
小计/Subtotal			19	7	20		
*具体见通识培养方案 For details, please refer to the Curriculum for General Education.							

(2) 军事体育健康课 Military, Physical Education and Health Courses

课程代码 Course Code	课程名称 Course Name	必修选修 Required/ Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
GENE1001	军事技能训练 Military Skills Training	必 Required	2	2		无 None	夏 Summer
GENE1002	军事理论与国家安全教育 Military Theory	必 Required	3			无 None	夏 Summer
GENE1401	体育与健康I Physical Education I	必 Required	0.5	0.5	2	无 None	1/秋 Y1/Fall
GENE1402	体育与健康II Physical Education II	必 Required	0.5	0.5	2	无 None	1/春 Y1/Spring
GENE2401	体育与健康III Physical Education III	必 Required	0.5	0.5	2	无 None	2/秋 Y2/Fall
GENE2402	体育与健康IV Physical Education IV	必 Required	0.5	0.5	2	无 None	2/春 Y2/Spring
GENE3401	体育与健康V Physical Education V	必 Required	0.5	0.5	2	无 None	3/秋 Y3/Fall
GENE3402	体育与健康VI Physical Education VI	必 Required	0.5	0.5	2	无 None	3/春 Y3/Spring
小计/Subtotal			8	5	12		

(3) 语言和沟通技能提升课 Language and Communication Skills Courses

英语实行 ABC 三级分级教学，根据不同等级要求，总计修满 12 学分。

The English curriculum follows a three-tier A, B, and C level system. Students are required to complete a total of 12 credits according to their assigned level.

课程代码 Course Code	课程名称 Course Name	必修选修 Required / Elective	要求 Requirements	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
LC1501	大学英语I-A General Academic English I-A	必 Required	A级修读 Required for Level A	3		4	无 None	1/秋 Y1/Fall
LC1502	大学英语II-A General Academic English II-A	必 Required		3		4	LC1501	1/春 Y1/Spring

LC2501	大学英语III-A General Academic English III-A	必 Required		3		4	LC1502	2/秋 Y2/Fall
LC1503	大学英语I-B General Academic English I-B	必 Required	B级修读 Required for Level B	3		4	无 None	1/秋 Y1/Fall
LC1504	大学英语II-B General Academic English II-B	必 Required		3		4	LC1503	1/春 Y1/Spring
LC2502	大学英语III-B General Academic English III-B	必 Required		3		4	LC1504	2/秋 Y2/Fall
LC1505	大学英语I-C General Academic English I-C	必 Required	C级修读 Required for Level C	3		4	无 None	1/秋 Y1/Fall
LC1506	大学英语II-C General Academic English II-C	必 Required		3		4	LC1505	1/春 Y1/Spring
LC2503	大学英语III-C General Academic English III-C	必 Required		3		4	LC1506	2/秋 Y2/Fall
LC2504	学术英语写作 与交流 Academic Writing and Presentation	必 Required	所有学生修读 Required for All Levels (A, B, C)	3		4	LC2501/ LC2502/ LC2503	2/春 Y2/Spring
小计/Subtotal				30		40		

其他沟通技能提升课程要求如下： Other requirements:

课程代码 Course Code	课程名称 Course Name	必修选修 Required/ Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
GENE2301	沟通与协作 Communication and Collaboration	必 Required	2		2	无 None	2/秋 Y2/Fall
小计/Subtotal			2		2		

2.理工基础课 Fundamental Science and Engineering Courses

课程代码 Course Code	课程名称 Course Name	必修选修 Required/ Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
MATH1101	高等数学I Calculus I	必 Required	4		5	无 None	1/秋 Y1/Fall
MATH1102	高等数学II Calculus II	必 Required	4		5	MATH1101	1/春 Y1/Spring
MATH1103	线性代数 Linear Algebra	必 Required	3		4	无 None	1/秋 Y1/Fall
MATH2101	概率论与数理统计 Probability Theory and Mathematical Statistics	必 Required	3		3	MATH1102	2/秋 Y2/Fall
PHYS1101	大学物理I General Physics I	必 Required	4		4	无 None	1/秋 Y1/Fall
PHYS1102	大学物理II General Physics II	必 Required	4		4	PHYS1101	1/春 Y1/Spring
PHYS1301	大学物理实验I General Physics Experiments I	必 Required	1	1	1	无 None	1/秋 Y1/Fall
PHYS1302	大学物理实验II General Physics Experiments II	必 Required	1	1	1	PHYS1301	1/春 Y1/Spring
CHEM1101	大学化学 General Chemistry	必 Required	3	1	3	无 None	1/春 Y1/Spring
CS1001	人工智能通识 Introduction to AI	必 Required	2	1	2	无 None	1/秋 Y1/Fall
CS1101	Python程序设计基础 Fundamentals of Python Programming	必 Required	3	1	3	无 None	1/春 Y1/Spring
小计/Subtotal			32	5	35		

3. 通识选修课程修读要求 Requirements for General Education Elective Courses

下列类型课程有最低学分修读要求

The following types of courses have a minimum credit requirement.

课程类型 Course Type	必修选修 Required/ Elective	最低学分 要求 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	推荐修读学期 Recommended Term
人文社科类通识课 Humanity and Social Science	选 Elective	2		2		2/秋 Y2/Fall
艺术类通识课 Arts	选 Elective	2		2		2/春 Y2/Spring
创新创业类通识课 Entrepreneurship	选 Elective	2	0.5	2		3/秋 Y3/Fall
其他通识课 Others	选 Elective	2		2		3/春 Y3/Spring
小计/Subtotal		8	0.5	8		

(二) 专业课程 Major-specific Module

1. 学科基础课程 Discipline-specific Foundational Module

课程代码 Course Code	课程名称 Course Name	必修选修 Required/ Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
ME2202	工程材料 Engineering Materials	必 Required	2	0.5	2	PHYS1101 CHEM1101	2/秋 Y2/Fall
ME2207*	工程力学I Engineering Mechanics I	必 Required	2		2	PHYS1101 MATH1102	2/秋 Y2/Fall
ME2301	工程图学与计算机制图 Engineering Drawing and Computer-aided Designs	必 Required	2	1	2	无 None	2/秋 Y2/Fall
ME2302	电工电子技术 Electrical and Electronic Engineering	必 Required	4	2	4	PHYS1102 MATH1102	2/秋 Y2/Fall
ME2204	工程科学计算方法 Numerical Methods for Engineering Science	必 Required	2		2	CS1101 MATH1102 MATH1103	2/春 Y2/Spring
ME2206	热力学与传热学基础 Fundamentals of Thermodynamics and Heat Transfer	必 Required	2	0.5	2	PHYS1101	2/春 Y2/Spring
ME2208*	工程力学II Engineering Mechanics II	必 Required	2	0.5	2	ME2207*	2/春 Y2/Spring
ME2209*	工程流体力学 Engineering Fluid Mechanics	必 Required	2		2	ME2207*	2/春 Y2/Spring
ME2303	机械原理与机械设计 Principles and Design of Machinery	必 Required	4	1	4	ME2207* ME2202 ME2301	2/春 Y2/Spring
EE3602	自动控制原理 Principles of Automatic Control	必 Required	3	1	3	MATH1102	3/秋 Y3/Fall
小计/Subtotal			25	6.5	25		

*注: ME2207 可用 ME2201 理论力学替代, ME2208 可用 ME2203 材料与结构力学替代, ME2209 可用 ME2205 流体力学替代。

Note: ME2207 may be substituted with ME2201 Theoretical Mechanics; ME2208 may be substituted with ME2203 Mechanics of Materials and Structures; ME2209 may be substituted with ME2205 Fluid Mechanics.

2. 专业核心课 Major Core Courses

课程代码 Course Code	课程名称 Course Name	必修选修 Required/ Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
ME3301	测量感知与数据处理 Measuring Sensing and Data Processing	必 Required	3	1	3	ME2302	3/秋 Y3/Fall

ME3309*	先进制造基础 Fundamentals of Advanced Manufacturing	必 Required	4	1	4	ME2303	3/秋 Y3/Fall
ME3310*	工业人工智能 Industrial Artificial Intelligence	必 Required	2		2	CS1101	3/秋 Y3/Fall
ME3311*	智能制造工业装备系统 Intelligent Manufacturing Equipment Systems	必 Required	3	1.5	3	ME3309*	3/春 Y3/Spring
ME3305	智能制造工业信息系统 Intelligent Manufacturing Information Systems	必 Required	3		3	EE3602	3/春 Y3/Spring
ME3306	工业机器人 Industrial Robots	必 Required	3	2	3	PHYS1101 EE3602	3/春 Y3/Spring
小计/Subtotal			18	5.5	18		

*注：ME3309 可用 ME3302 机械制造和计算机辅助制造替代，ME3310 可用 ME3303 机器学习与应用替代，ME3311 可用 ME3304 智能制造工业装备系统替代。

Note: ME3309 may be substituted with ME3302 Manufacturing and CAM; ME3310 may be substituted with ME3303 Machine Learning and Applications; ME3311 may be substituted with ME3304 Intelligent Manufacturing and Industrial Systems.

3. 专业选修课（至少修读 10 学分，可自主修读）

Major Elective Courses (A minimum of 10 credits must be completed. Students may choose courses freely.)

课程代码 Course Code	课程名称 Course Name	必修选修 Required / Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
ME1001	智能制造工程与数字化导论 Digitalization and Intelligent Manufacturing-An Overview	选 Elective	1		1	无 None	1/春 Y1/Spring
CS2201	数据结构与算法 Data Structures and Algorithms	选 Elective	4	2	4	CS1101	2/秋 Y2/Fall
CS2001	人工智能导论 Artificial Intelligence-An Overview	选 Elective	4	2	4	CS2201 MATH1103 MATH2101	2/春 Y2/Spring
CS2204	计算机网络 Computer Networks	选 Elective	3	1	3	CS2201	2/春 Y2/Spring
CS3501	计算机图形学 Computer Graphics	选 Elective	3	1	3	CS2201	3/秋 Y3/Fall
ME3001	工程经济学 Engineering Economics	选 Elective	2		2	无 None	3/秋 Y3/Fall
ME3201	微纳制造 Micro- and Nano-Fabrication	选 Elective	2	1	2	PHYS1102 CHEM1101	3/秋 Y3/Fall
ME3601	增材制造 Additive Manufacturing	选 Elective	2	1	2	ME3309*	3/春 Y3/Spring
ME3602	飞行器制造 Aircraft Manufacturing	选 Elective	3	2	3	EE3602 ME2207*	3/春 Y3/Spring
CS3205	智能机器人 Intelligent Robots	选 Elective	3	1	3	CS2001	3/春 Y3/Spring
CS3505	物联网 Internet of Things (IoT)	选 Elective	3	1	3	CS2204	3/春 Y3/Spring
ME4501	虚拟工程技术 Virtual Engineering Technology	选 Elective	3		3	ME2204	4/秋 Y4/Fall
ME4602	精密测量 Precision Metrology	选 Elective	2	1	2	ME3301	4/秋 Y4/Fall
ME4603*	特种加工 Specialized Machining	选 Elective	2	1	2	ME3309*	4/秋 Y4/Fall
ME4802*	动力学与控制 Dynamics and Control	选 Elective	3	1	3	EE3602	4/秋 Y4/Fall
CS3502	计算机视觉 Computer Vision	选 Elective	3	1	3	CS2201 MATH1103 MATH2101	4/秋 Y4/Fall
CS4502	虚拟现实技术 Virtual Reality	选 Elective	3	1	3	CS3502	4/秋 Y4/Fall

CS3503	数字孪生 Digital Twin	选 Elective	3	1	3	CS3501	4/春 Y4/Spring
小计/Subtotal			49	18	49		

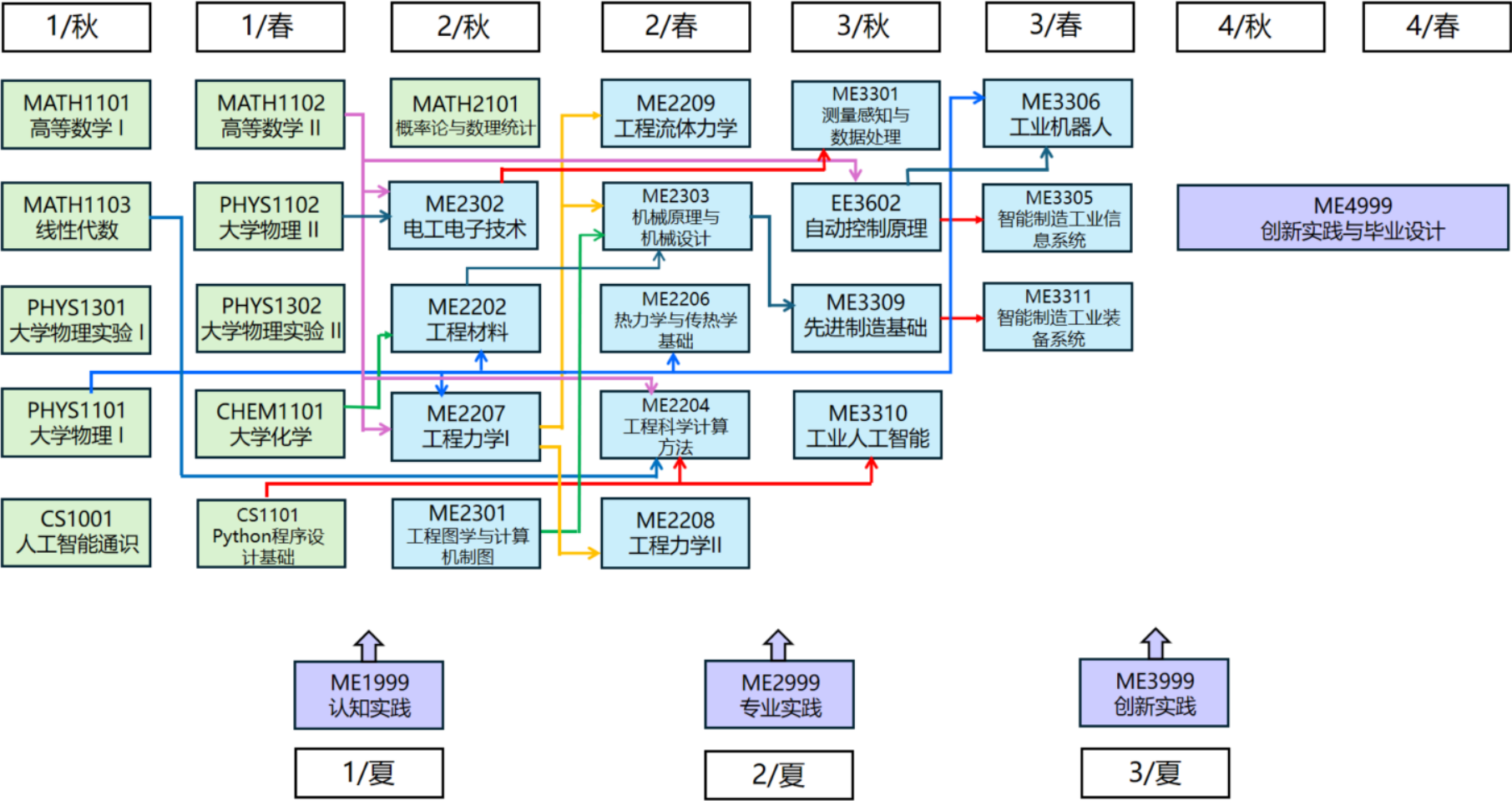
*注：ME4603 可用 ME4601 特种加工替代，ME4802 可用 ME4801 动力学与控制替代。

Note: ME4603 may be substituted with ME4601 Specialized Machining; ME4802 may be substituted with ME4801 Dynamics and Control.

(三) 集中实践环节 Intensive Practical Training Module

课程代码 Course Code	课程名称 Course Name	必修选修 Required / Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
ME1999	认知实践 Summer Internship I	必 Required	4	4	8 周/ Weeks	无 None	1/夏 Y1/Summer
ME2999	专业实践 Summer Internship II	必 Required	4	4	8 周/ Weeks	无 None	2/夏 Y2/Summer
ME3999	创新实践 Summer Internship III	必 Required	4	4	8 周/ Weeks	无 None	3/夏 Y3/Summer
ME4999	创新实践与毕业设计 Capstone Project	必 Required	8	8	32 周/ Weeks	无 None	4/秋-4/春 Y4/Fall-Y4/Spring
小计/Subtotal			20	20	56 周/ Weeks		

十、专业课程关联图（不包括选修课） Roadmap for Major Courses (Electives Unincluded)



附表一：主要专业实验和集中实践性环节

Appendix Table 1: Major Experiments and Intensive Practical Training Activities

课程代码 Course Code	课程名称 Course Name	必修选修 Required/ Elective	总学分 Credits	实践学分 Practical Credits	周学时 Weekly Load	先修课程 Prerequisites	学期 Term
ME2202	工程材料 Engineering Materials	必 Required	2	0.5	2	PHYS1101 CHEM1101	2/秋 Y2/Fall
ME2301	工程图学与计算机 制图 Engineering Drawing and Computer-aided Designs	必 Required	2	1	2	无 None	2/秋 Y2/Fall
ME2302	电工电子技术 Electrical and Electronic Engineering	必 Required	4	2	4	PHYS1102 MATH1102	2/秋 Y2/Fall
CS2201	数据结构与算法 Data Structures and Algorithms	选 Elective	4	2	4	CS1101	2/秋 Y2/Fall
ME2206	热力学与传热学基础 Fundamentals of Thermodynamics and Heat Transfer	必 Required	2	0.5	2	PHYS1101	2/春 Y2/Spring
ME2208	工程力学II Engineering MechanicsII	必 Required	2	0.5	2	ME2207	2/春 Y2/Spring
ME2303	机械原理与机械设计 Principles and Design of Machinery	必 Required	4	1	4	ME2207 ME2202 ME2301	2/春 Y2/Spring
CS2001	人工智能导论 Artificial Intelligence-An Overview	选 Elective	4	2	4	CS2201 MATH1103 MATH2101	2/春 Y2/Spring
CS2204	计算机网络 Computer Networks	选 Elective	3	1	3	CS2201	2/春 Y2/Spring
EE3602	自动控制原理 Principles of Automatic Control	必 Required	3	1	3	MATH1102	3/秋 Y3/Fall
ME3301	测量感知与数据处理 Measuring Sensing and Data Processing	必 Required	3	1	3	ME2302	3/秋 Y3/Fall
ME3309	先进制造基础 Fundamentals of Advanced Manufacturing	必 Required	4	1	4	ME2303	3/秋 Y3/Fall
CS3501	计算机图形学 Computer Graphics	选 Elective	3	1	3	CS2201	3/秋 Y3/Fall
ME3201	微纳制造 Micro- and Nano-Fabrication	选 Elective	2	1	2	PHYS1102 CHEM1101	3/秋 Y3/Fall
ME3311	智能制造工业 装备系统 Intelligent Manufacturing Equipment Systems	必 Required	3	1.5	3	ME3309	3/春 Y3/Spring
ME3306	工业机器人 Industrial Robots	必 Required	3	2	3	PHYS1101 EE3602	3/春 Y3/Spring
ME3601	增材制造 Additive Manufacturing	选 Elective	2	1	2	ME3309	3/春 Y3/Spring
ME3602	飞行器制造 Aircraft Manufacturing	选 Elective	3	2	3	EE3602 ME2207	3/春 Y3/Spring
CS3205	智能机器人 Intelligent Robots	选 Elective	3	1	3	CS2001	3/春 Y3/Spring
CS3505	物联网 Internet of Things (IoT)	选 Elective	3	1	3	CS2204	3/春 Y3/Spring
ME4603	特种加工 Specialized Machining	选 Elective	2	1	2	ME3309	4/秋 Y4/Fall
ME4602	精密测量 Precision Metrology	选 Elective	2	1	2	ME3301	4/秋 Y4/Fall
ME4802	动力学与控制 Dynamics and Control	选 Elective	3	1	3	EE3602	4/秋 Y4/Fall

CS3502	计算机视觉 Computer Vision	选 Elective	3	1	3	CS2201 MATH1103 MATH2101	4/秋 Y4/Fall
CS4502	虚拟现实技术 Virtual Reality	选 Elective	3	1	3	CS3502	4/秋 Y4/Fall
CS3503	数字孪生 Digital Twin	选 Elective	3	1	3	CS3501	4/春 Y4/Spring
ME1999	认知实践 Summer Internship I	必 Required	4	4	8 周/ Weeks	无 None	1/夏 Y1/Summer
ME2999	专业实践 Summer Internship II	必 Required	4	4	8 周/ Weeks	无 None	2/夏 Y2/Summer
ME3999	创新实践 Summer Internship III	必 Required	4	4	8 周/ Weeks	无 None	3/夏 Y3/Summer
ME4999	创新实践与毕业设计 Capstone Project	必 Required	8	8	32 周/ Weeks	无 None	4/秋-4/春 Y4/Fall- Y4/Spring
小计/Subtotal			95	50	75+56周 /Weeks		