

宁波东方理工大学

2026 级生物医学工程本科专业培养方案

Curriculum for the Program of Biomedical Engineering (2026)

Eastern Institute of Technology, Ningbo

一、专业介绍 Introduction to the Program

依托学校生物与医药类学科优势，生物医学工程专业致力于培养具备坚实理论基础、突出实验能力和多学科融合能力的拔尖创新人才。本专业现有包含多名院士和讲席教授在内的一流师资队伍，覆盖生命科学、信息技术与人工智能等前沿领域，具备较强的教学与科研实力。核心课程涵盖生物医学传感检测与仪器、生物信息学、机器学习与医学工程，强化基础知识与创新实践能力。本专业授予工学学士学位，修业年限 4 年，培养特色包括“1+3”通专融合、科研训练及带学分夏季学期实践强化创新能力等。学校配备完整的教学科研软件与现代化的硬件设备，与多家龙头制造企业建立就业合作，毕业生可投身新材料、医药、医院等行业从事研发、检测及管理工作，或赴国内外高校和科研机构继续深造。

Leveraging the strengths of the university in biological and pharmaceutical sciences, the Biomedical Engineering program is dedicated to cultivating top innovative talents with solid theoretical foundations, outstanding experimental capabilities, and interdisciplinary integration competence. The program boasts a world-class faculty including multiple academicians and chair professors, covering frontier areas such as life sciences, information technology, and artificial intelligence, with strong capabilities in both teaching and research. Core courses encompass biomedical sensing, detection and instrumentation, bioinformatics, and machine learning for medical engineering, reinforcing fundamental knowledge and innovative practice skills. The program awards the Bachelor of Engineering (B.Eng.) degree with a duration of four years. Distinctive features include the "1+3" general-specialized integration model, research training, and credit-bearing summer practice programs to enhance innovation capabilities. The university is equipped with comprehensive teaching and research software and modern hardware facilities, and has established employment partnerships with leading manufacturing enterprises. Graduates may pursue careers in R&D, testing, and management in industries such as new materials, pharmaceuticals, and healthcare, or continue their studies at domestic and international universities and research institutions.

二、培养目标 Program Objective

本专业立足长三角生物医药与健康产业，面向国家高水平科技自立自强和人民生命健康战略需求，培养德智体美劳全面发展，系统掌握数理化信基础与生物医学工程核心理论，具备工程实践与创新、多学科交叉融合、AI 技术应用等关键能力，拥有家国情怀与全球视野、良好职业道德与社会责任感、卓越领导力与团队协作精神的拔尖创新型高素质专门人才。毕业生能够在高端医疗器械、生物医药研发、智慧医疗科技等领域从事智能诊疗设备研发、生物材料创新、医疗数据分析等核心业务，预期毕业 5 年左右成长为行业技术中坚、项目负责人或青年研究员等高层次创新型人才。学生毕业五年后的预期目标包括：

This program is grounded in the biomedical and health industry of the Yangtze River Delta region, addressing the national strategic need for high-level scientific and

technological self-reliance and safeguarding people's life and health. The program cultivates top-tier innovative talents with all-round development in moral, intellectual, physical, aesthetic, and labor education, who have systematically mastered core foundations in mathematics, physics, chemistry, information science, and biomedical engineering, and possess key competencies in engineering practice and innovation, interdisciplinary integration, and AI technology application. Graduates demonstrate patriotism and a global perspective, sound professional ethics, outstanding leadership, and teamwork spirit. They will engage in intelligent diagnostic device R&D, biomaterial innovation, and medical data analysis in high-end medical devices, biomedical R&D, and smart healthcare, expected to grow into industry technical backbones, project leaders, or young researchers within five years. The expected outcomes for graduates five years after graduation include:

1.具备家国情怀、全球视野；拥有良好的职业道德、社会责任感、领导力等人文素养；面对挫折保持韧性，坚持追求卓越；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。

Possess patriotism and a global perspective; demonstrate professional ethics, social responsibility, leadership, and other humanistic qualities; maintain resilience in the face of setbacks and persist in the pursuit of excellence; possess effective communication and expression skills, teamwork capabilities, and lifelong learning commitment.

2.掌握扎实的数理化信基础、生物医学工程专业及多学科交叉领域知识，具有从事高水平生物医学工程创新工作的专业能力，依托 AI 交叉培养优势，成为智慧医疗、精准诊断领域的项目负责人，主导开发医疗数据分析模型或远程监测系统，促进多学科技术产业落地。

Master solid foundations in mathematics, physics, chemistry, and information science, as well as professional knowledge in biomedical engineering and interdisciplinary fields; possess professional competence to engage in high-level innovative work in biomedical engineering. Leveraging the cross-disciplinary training advantages in AI, become a project leader in smart healthcare and precision diagnosis, leading the development of medical data analysis models or remote monitoring systems, and facilitating the industrial application of multidisciplinary technologies.

3.具有思辨能力、创造性思维和工程理念，在高端医疗器械企业、生物医药研发平台、智慧医疗科技公司担任研发和管理骨干，运用生物医学传感、机器学习等技能，主导智能诊疗设备或生物材料研发，推动行业关键技术突破。

Possess critical thinking, creative thinking, and engineering philosophy; serve as R&D and management backbone in high-end medical device enterprises, biomedical R&D platforms, and smart healthcare technology companies; apply skills in biomedical sensing, machine learning, and related areas to lead the development of intelligent diagnostic and therapeutic devices or biomaterials, driving breakthroughs in key industry technologies.

4.通过训练积累的科研创新能力，在国内外顶尖院校取得研究生学位，或进

入高校院所、科研机构、三甲医院等担任青年研究员，承担省部级产学研医相关的基础和应用转化项目。

Through accumulated research and innovation capabilities developed during training, obtain graduate degrees at top domestic and international institutions, or serve as young researchers at universities and research institutes, and top-tier hospitals (Grade A, Class 3), undertaking provincial or ministerial-level basic and applied translational projects integrating industry, academia, research, and medicine.

三、培养要求 Graduate Outcomes

1. 工程知识：掌握数学、物理、信息技术等自然科学基础知识，为生物医学工程问题的建模分析和技术应用提供支撑；系统掌握生命科学、电子技术、信息技术、仪器自动化等学科核心内容及实验基础；了解生物医学工程与材料科学、生命科学、化学等相关交叉领域的基本知识和发展趋势；具备获取、整合、评估生物医学工程文献和学术信息的能力，了解生物医学工程发展历史、学科前沿和发展趋势。

Engineering Knowledge: Master foundational knowledge in mathematics, physics, and information science to support modeling, analysis, and technological application of biomedical engineering problems; systematically master the core content and experimental foundations of life sciences, electronic technology, information technology, and instrumentation automation; understand basic knowledge and development trends in interdisciplinary fields related to biomedical engineering such as materials science, life sciences, and chemistry; possess the ability to acquire, integrate, and evaluate biomedical engineering literature and academic information, and understand the history, frontiers, and development trends of biomedical engineering.

2. 问题分析：能独立分析和解决复杂生物医学工程问题，具备严密的逻辑推理能力和科学判断力；能将理论知识运用于问题建模、实验设计与结果解释中，提出合理解决策略。

Problem Analysis: Be able to independently analyze and solve complex biomedical engineering problems, with rigorous logical reasoning and scientific judgment capabilities; be able to apply theoretical knowledge to problem modeling, experimental design, and result interpretation, and propose reasonable solution strategies.

3. 设计/开发解决方案：敢于质疑，具有逻辑思维、创新精神和创业意识，掌握基本创新方法，了解创业基本途径，具有综合运用理论和技术手段开展创新创业活动的的能力；能够针对复杂生物医学工程问题设计和开发解决方案，设计满足特定需求的系统、单元或工艺流程，体现创新性，并从健康、安全、环境、法律与伦理、社会与文化等角度考虑可行性。

Design/Development of Solutions: Dare to question; possess logical thinking, innovative spirit, and entrepreneurial awareness; master basic innovation methods, understand fundamental entrepreneurial approaches, and have the capability to comprehensively apply theoretical and technical means to engage in innovation and entrepreneurship activities; be able to design and develop solutions for complex biomedical engineering problems, designing systems, components, or processes that

meet specific requirements, demonstrating innovation, and considering feasibility from perspectives of health, safety, environment, legal and ethical considerations, and social and cultural factors.

4.研究：能够基于科学原理并采用科学方法对复杂生物医学工程问题进行研究，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: Be able to conduct research on complex biomedical engineering problems based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and synthesizing information to obtain reasonable and valid conclusions.

5.使用现代工具：能够针对复杂工程问题，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 of Modern Tools: Be able to develop, select, and use appropriate technologies, resources, modern engineering tools, and information technology tools for complex engineering problems, including prediction and simulation of complex engineering problems, and understand their limitations.

6.工程与可持续发展：在解决复杂工程问题时，能够基于工程相关背景知识，分析和评价工程实践对健康、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 Sustainability: In solving complex engineering problems, be able to analyze and evaluate the impacts of engineering practice on health, safety, environment, law, and economic and social sustainable development based on relevant engineering background knowledge, and understand the responsibilities to be assumed.

7.工程伦理和职业规范：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，能够理解和践行工程伦理，在工程实践中遵守工程职业道德、规范和相关法律，履行责任。

Engineering Ethics and Professionalism: Possess awareness of serving the country through engineering and benefiting the people; demonstrate humanistic and social science literacy and social responsibility; be able to understand and practice engineering ethics; abide by engineering professional ethics, norms, and relevant laws in engineering practice; and fulfill responsibilities.

8.个人和团队：能够在多样化、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。

Individual and Teamwork: Be able to assume roles as individuals, team members, and leaders in diverse, multidisciplinary teams.

9.沟通：能够就复杂生物医学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；能够在跨文化背景下进行沟通和交流，理解、尊重语言和文化差异。

Communication: Be able to effectively communicate and exchange ideas on complex biomedical engineering problems with industry peers and the public, including

writing reports and design documents, making presentations, clearly expressing or responding to instructions; and be able to communicate and exchange in cross-cultural contexts, understanding and respecting linguistic and cultural differences.

10.项目管理: 理解并掌握与工程项目相关的管理原理与经济决策方法,并能够在多学科环境中应用。

Project Management: Understand and master management principles and economic decision-making methods related to engineering projects, and be able to apply them in multidisciplinary environments.

11.终身学习: 具有自主学习、终身学习和批判性思维的意识 and 能力,能够理解广泛的技术变革对工程和社会的影响,适应新技术变革。

Lifelong Learning: Possess awareness and capabilities for self-directed learning, lifelong learning, and critical thinking; be able to understand the impacts of broad technological changes on engineering and society; and adapt to new technological transformations.

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;顺应生物医学工程行业的发展趋势,突出人工智能医学信息化特色,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 the biomedical engineering industry, the program emphasizes AI-enabled medical informatics 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 Educational Program 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 152 学分。课程结构要求如下：

A minimum of 152 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 (51学分/Credits)	必修 Required	学科基础课程 Discipline-specific Foundational Module	21
	必修 Required	专业核心课 Major Core Courses	18
	选修 Elective	专业选修课 Major Elective Courses	12
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 Project	8 (32周/Weeks)
毕业学分要求 Graduation Credits Requirement			152

基于国标要求的各指标如下：Credit Distribution Against National Standard Requirements

课程类别 Category	学分 Credit	所占比例 Percentage (%)	国标要求 National Standard
专业课程 (Major-specific Module)	51	33.6%	42-57学分/credits
实践教学环节 (Practical Teaching Module)	49.5	32.6%	≥25%
实验教学 (Laboratory Teaching)	27.5	18.1%	> 27学分/credits
注：上表中，实践教学环节未包含专业选修课实践学分。 The credits for the practical teaching module exclude practical credits from major elective courses.			

七、主要课程设置 Core Courses

生物医学工程基础、生物医学传感检测与仪器、生物信息学、生物医学材料、生物医学光子学、生物与医药基础。

Fundamentals of Biomedical Engineering, Biomedical Sensors and

Instrumentation, Bioinformatics, Biomedical Materials, Biomedical Photonics, Biology and Pharmaceutical Basics.

八、主要实践性教学环节和主要专业实验

Major Practical Training and Core Laboratory Courses

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，及早参与科研创新项目，期间可以选择与暑假实践、第四学年创新项目相融合。

The major practical training components include: summer-term cognitive practice, professional practice, innovation practice and undergraduate thesis/design, as well as various domestic and international undergraduate academic competitions and innovation contests. In addition, students select an academic mentor team upon enrollment to participate in research and innovation projects at an early stage, with the option to integrate these projects with summer practice or the fourth-year innovation program.

主要专业实验包括：电子电工技术实验、分子细胞生物学实验、解剖与生理学实验、工程图学与计算机制图实验、生物医学工程基础实验、生物医学传感检测与仪器实验、生物医学材料实验、生物医学光子学实验、生物与医药基础实验。

Core laboratory courses include: Electrical and Electronic Engineering, Molecular Cell Biology Laboratory, Anatomy and Physiology Laboratory, Engineering Drawing and Computer-aided Designs, Foundation of Biomedical Engineering Laboratory, Biomedical Sensors and Instrumentation Laboratory, Biomedical Materials Laboratory, Biomedical Photonics Laboratory and Biology and Pharmaceutical Basics Laboratory.

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	无 None	2/秋 Y2/Fall
艺术类通识课 Arts	选 Elective	2		2	无 None	2/春 Y2/Spring
创新创业类通识课 Entrepreneurship	选 Elective	2	0.5	2	无 None	3/秋 Y3/Fall
其他通识课 Others	选 Elective	2		2	无 None	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
ME2302	电工电子技术 Electrical and Electronic Engineering	必 Required	4	2	4	PHYS1102 MATH1102	2/秋 Y2/Fall
BME2201	分子细胞生物学 Molecular Cell Biology	必 Required	3	2	4	无 None	2/秋 Y2/Fall
EE2302	信号与系统 Signals and Systems	必 Required	4	1	4	MATH1102	2/秋 Y2/Fall
BME2202	解剖与生理学 Anatomy and Physiology	必 Required	3	1	3	BME2201	2/春 Y2/Spring
BME2203	生物医学统计基础 Fundamentals of Biostatistics	必 Required	3		3	MATH1103 MATH2101	2/春 Y2/Spring
BME2301	生物医学工程伦理 Ethics in Biomedical Engineering	必 Required	1		1	无 None	2/春 Y2/Spring
ME2301	工程图学与计算机制图 Engineering Drawing and Computer-aided Designs	必 Required	2	1	2	无 None	3/秋 Y3/Fall
BME3301	医疗仪器法律法规 Medical Device Laws and Regulations	必 Required	1		1	BME2301	3/春 Y3/Spring
小计/Subtotal			21	7	22		

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
BME2101	生物医学工程基础 Fundamentals of Biomedical Engineering	必 Required	3	1	3	无 None	2/秋 Y2/Fall
BME2302	生物医学传感检测与仪器 Biomedical Sensors and Instrumentation	必 Required	3	1	3	BME2101	2/春 Y2/Spring
BME3201	生物信息学 Bioinformatics	必 Required	3		3	BME2203	3/秋 Y3/Fall
BME3302	生物医学材料 Biomedical Materials	必 Required	3	1	3	BME2101	3/秋 Y3/Fall
BME3202	生物医学光子学 Biomedical Photonics	必 Required	3	1	3	BME2101	3/秋 Y3/Fall
BME3501	生物与医药基础 Biology and Pharmaceutical Basics	必 Required	3	1	3	BME3302	3/春 Y3/Spring
小计/Subtotal			18	5	18		

3.专业选修课（至少修读 12 学分，可自主修读，也可参考附表二的推荐修读‘套餐’）

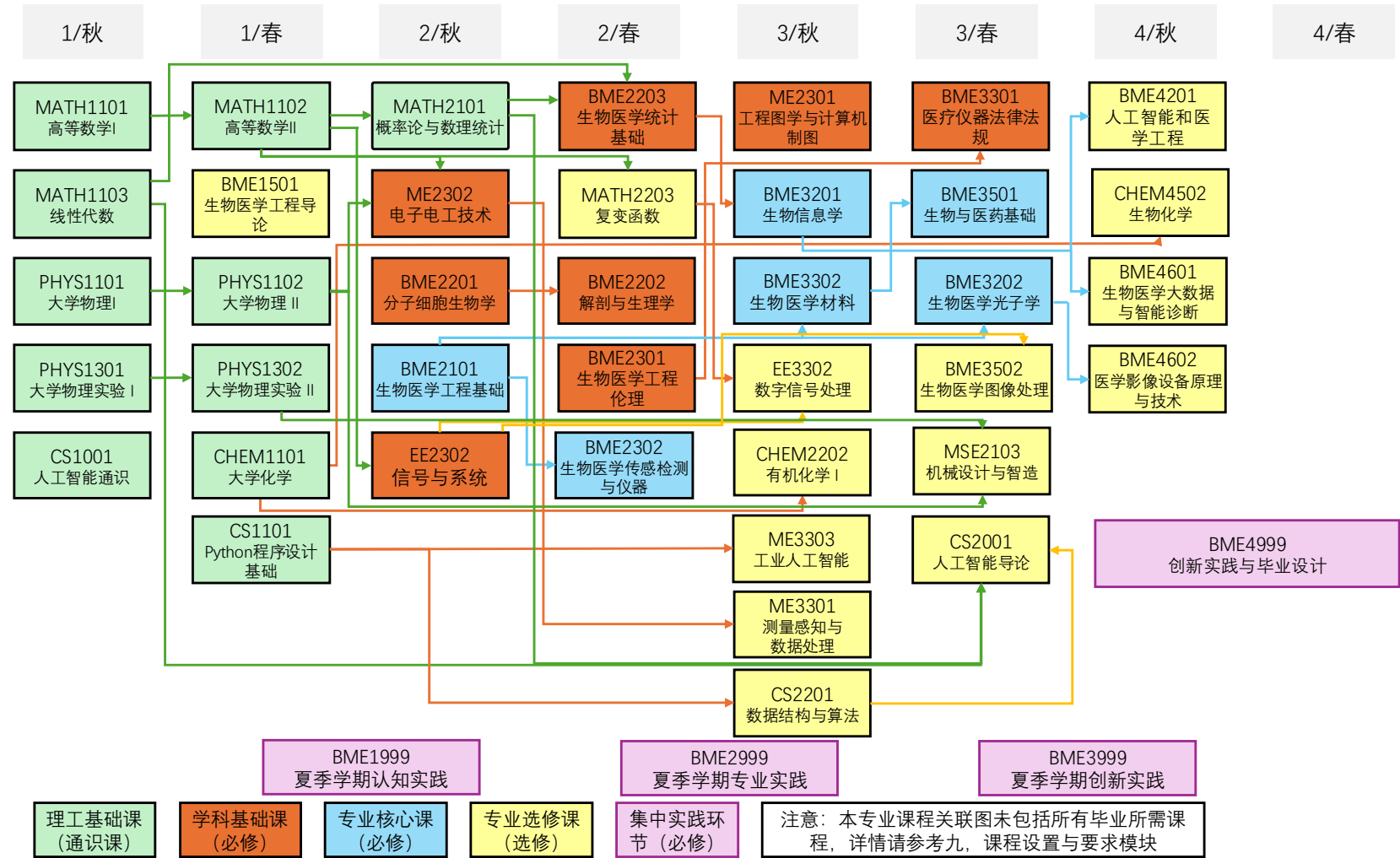
Major Elective Courses (A minimum of 12 credits must be completed. Students may choose courses freely or follow the recommended 'bundles' outlined in Appendix Table 2.)

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
BME1001	生物医学工程导论 Introduction to Biomedical Engineering	选 Elective	1	0.5	1	无 None	1/春 Y1/Spring
MATH2203	复变函数 Complex Analysis	选 Elective	3		3	MATH1102	2/春 Y2/Fall
EE3302	数字信号处理 Digital Signal Processing	选 Elective	3	1	3	EE2302	3/秋 Y3/Fall
CHEM2202	有机化学I Organic Chemistry I	选 Elective	4		4	CHEM1101	3/秋 Y3/Fall
ME3301	测量感知与数据处理 Measuring Sensing and Data Processing	选 Elective	3	1	3	ME2302	3/秋 Y3/Fall
ME3310	工业人工智能 Industrial Artificial Intelligence	选 Elective	2		2	CS1101	3/秋 Y3/Fall
CS2201	数据结构与算法 Data Structures and Algorithms	选 Elective	4	2	4	CS1101	3/秋 Y3/Fall
CS2001	人工智能导论 Artificial Intelligence-An Overview	选 Elective	4	2	4	CS2201 MATH1103 MATH2101	3/春 Y2/Spring
MSE2103	机械设计与制造 Mechanical Design and Manufacture	选 Elective	2		2	PHYS1102 PHYS1302	3/春 Y3/Spring
BME3502	生物医学图像处理 Biomedical Image Processing	选 Elective	3	2	3	EE2302	3/春 Y3/Spring
BME4201	人工智能和医学工程 Artificial Intelligence for Biomedical Engineering	选 Elective	3		3	BME3201	4/秋 Y4/Fall
CHEM4502	生物化学 Biochemistry	选 Elective	3		3	CHEM1101	4/秋 Y4/Fall
BME4601	生物医学大数据 与智能诊断 Biomedical Big Data and Intelligent Diagnosis	选 Elective	3	1	3	BME3201	4/秋 Y4/Fall
BME4602	医学影像设备原理与技术 Principles and Technology of Medical Imaging Equipment	选 Elective	3	1	3	BME3202	4/秋 Y4/Fall
小计/Subtotal			41	10.5	41		

（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
BME1999	认知实践 Summer Internship I	必 Required	4	4	8 周/ Weeks	无 None	1/夏 Y1/Summer
BME2999	专业实践 Summer Internship II	必 Required	4	4	8 周/ Weeks	无 None	2/夏 Y2/Summer
BME3999	创新实践 Summer Internship III	必 Required	4	4	8 周/ Weeks	无 None	3/夏 Y3/Summer
BME4999	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 Roadmap for Major Courses



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
ME2302	电工电子技术 Electrical and Electronic Engineering	必 Required	4	2	4	PHYS1102 MATH1102	2/秋 Y2/Fall
BME2201	分子细胞生物学 Molecular Cell Biology	必 Required	3	2	4	无 None	2/秋 Y2/Fall
EE2302	信号与系统 Signals and Systems	必 Required	4	1	4	MATH1102	2/春 Y2/Spring
BME2202	解剖与生理学 Anatomy and Physiology	必 Required	3	1	3	BME2201	2/春 Y2/Spring
ME2301	工程图学与计算机制图 Engineering Drawing and Computer-aided Designs	必 Required	2	1	2	无 None	3/秋 Y3/Fall
BME2101	生物医学工程基础 Biomedical Engineering Design	必 Required	3	1	3	无 None	2/秋 Y2/Fall
BME2302	生物医学传感检测 与仪器 Biomedical Sensors and Instrumentation	必 Required	3	1	3	BME2101	2/春 Y2/Spring
BME3302	生物医学材料 Biomedical Materials	必 Required	3	1	3	BME2101	3/秋 Y3/Fall
BME3202	生物医学光子学 Biomedical Photonics	必 Required	3	1	3	BME2101	3/秋 Y3/Fall
BME3501	生物与医药基础 Biology and Pharmaceutical Basics	必 Required	3	1	3	BME3302	3/春 Y3/Spring
BME1001	生物医学工程导论 Introduction to Biomedical Engineering	选 Elective	1	0.5	1	无 None	1/春 Y1/Spring
EE3302	数字信号处理 Digital Signal Processing	选 Elective	3	1	3	EE2302	3/秋 Y3/Fall
ME3301	测量感知与数据处理 Measuring Sensing and Data Processing	选 Elective	3	1	3	ME2302	3/秋 Y3/Fall
CS2201	数据结构与算法 Data Structures and Algorithms	选 Elective	4	2	4	CS1101	3/秋 Y3/Fall
CS2001	人工智能导论 Artificial Intelligence-An Overview	选 Elective	4	2	4	CS2201 MATH1103 MATH2101	3/春 Y2/Spring
BME3502	生物医学图像处理 Biomedical Image Processing	选 Elective	3	2	3	EE3302	3/春 Y3/Spring
BME4601	生物医学大数据 与智能诊断 Biomedical Big Data and Intelligent Diagnosis	选 Elective	3	1	3	BME3202	4/秋 Y4/Fall
BME4602	医学影像设备原理 与技术 Principles and Technology of Medical Imaging Equipment	选 Elective	3	1	3	BME3201	4/秋 Y4/Fall
BME1999	认知实践 Summer Internship I	必 Required	4	4	8周/ Weeks	无 None	1/夏 Y1/Summer
BME2999	专业实践 Summer Internship II	必 Required	4	4	8周/ Weeks	无 None	2/夏 Y2/Summer
BME3999	创新实践 Summer Internship III	必 Required	4	4	8周/ Weeks	无 None	3/夏 Y3/Summer
BME4999	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- Y3/Spring
小计/Subtotal			75	42.5	56+32周/		

			Weeks		
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附表二：专业选修课修读方向推荐

可侧重修读下列 2 个方向之一的课程，为未来进入该领域的研究打下基础。

Appendix Table 2: Recommended Directions for Elective Courses in the Major.

Students may choose to focus on one of the following 2 directions, laying a foundation for future research in the field.

方向一：生物医学工程仪器方向 Direction 1: Biomedical Engineering Instrumentation		方向二：生物医学信息工程方向 Direction 2: Biomedical Informatics and Engineering	
课程代码 Course Code	课程名称 Course Name	课程代码 Course Code	课程名称 Course Name
ME3301	测量感知与数据处理 Measurement Sensing and Data Processing	MATH2203	复变函数 Complex Analysis
EE3302	数字信号处理 Digital Signal Processing	CS2201	数据结构与算法 Data Structures and Algorithms
BME3502	生物医学图像处理 Biomedical Image Processing	CS2001	人工智能导论 Artificial Intelligence-An Overview
ME3303	工业人工智能 Industrial Artificial Intelligence	ME3303	工业人工智能 Industrial Artificial Intelligence
MSE2103	机械设计与制造 Mechanical Design and Manufacture	BME4201	人工智能和医学工程 Artificial Intelligence for Biomedical Engineering
BME4602	医学影像设备原理与技术 Principles and Technology of Medical Imaging Equipment	BME4601	生物医学大数据 与智能诊断 Biomedical Big Data and Intelligent Diagnosis