

人工智能（博学实验班）专业 2024 版本本科培养方案

Undergraduate Education Plan for Specialty in

Artificial Intelligence Extensive Experimental Class(2024)

专业名称	人工智能	主干学科	人工智能
Major	Artificial Intelligence	Major Disciplines	Artificial Intelligence
计划学制	四年	授予学位	工学学士
Duration	4years	Degree Granted	Bachelor of Engineering

最低毕业学分规定

Graduation Credit Criteria

课程分类 Course Classification 课程性质 Course Nature	通识教育课程 General Education Courses	学科基础课程 Disciplinary Fundamental Courses	专业课程 Specialty Elective Courses	个性课程 Personalized Course	集中性实践教学环节 Specialized Practice Schedule	课外学分 Extra- Course Credits	总学分 Total Credits
必修课 Required Courses	35	33	\	\	24	\	92
选修课 Elective Courses	\	\	\	\	\		

一、专业简介

1 Professional Introduction

人工智能 (Artificial Intelligence), 是一个以计算机科学为基础, 由计算机、心理学、哲学等多学科交叉融合的交叉、新兴学科, 研究、开发用于模拟、延伸和扩展人的智能的理论、方法、技术及应用系统的一门新的技术科学, 企图了解智能的实质, 并生产出一种新的能以人类智能相似的方式做出反应的智能机器。本专业 2021 年开始按照计算机类大类招生, 2019 年“人工智能”获批湖北省十四五优势特色学科群。本专业立足武汉理工大学计算机学科、一级学科国家重点学科、数字出版智能服务技术教育部工程研究中心、交通物联网技术湖北省重点实验室办学, 拥有一支以湖北省百人、教育部新世纪人才计划获得者、首席教授为引领, 特色专业责任教授、青年教学名师等优秀中青年教师为骨干的高水平教师队伍, 形成了“智能方法与智能系统”、“数据技术及其应用”、“云计算理论及技术”、“可信安全物联网技术”等稳定而有特色的学科研究方向。承担省部级科研项目共 10 余项, 教育改革项目 5 项以上, 在国际顶刊会议上收录论文 100 余篇。

Artificial Intelligence (AI) is an interdisciplinary and emerging field based on computer science, integrating computer technology, psychology, philosophy, and other disciplines. It aims to study and develop theories, methods, technologies, and application systems for simulating, extending, and expanding human intelligence. AI attempts to understand the essence of intelligence and produce intelligent machines

that can react in a way similar to human intelligence. The major of AI started enrolling students under the computer science category in 2021. In 2019, "Artificial Intelligence" was approved as a key characteristic discipline group in Hubei Province's 14th Five-Year Plan. This major is based at Wuhan University of

Technology, focusing on computer science, a national key discipline, the Ministry of Education's Engineering Research Center for Digital Publishing Intelligent Services, and the Hubei Province Key Laboratory of Traffic Internet of Things Technology. It has a high-level faculty team consisting of backbone professors, young and excellent teachers, including recipients of the Hundred Talent Program in Hubei Province, the Ministry of Education's New Century Talents Program, and chief professors, forming stable and distinctive research directions such as "Intelligent Methods and Intelligent Systems," "Data Technology and Its Applications," "Cloud Computing Theory and Technology," and "Trusted Security Internet of Things Technology." The major undertakes more than 10 provincial and ministerial-level research projects, as well as more than 5 education reform projects, and has published over 100 papers in top international journals and conferences.

二、培养目标与毕业要求

2 Educational Objectives & Requirements

(一) 培养目标

本专业面向国家经济社会发展和信息技术行业需求，培养具备扎实的数学、自然、计算机科学知识基础，掌握人工智能科学、技术相关的基本理论、基本知识、基本技能和基本方法，具有较强专业能力的人工智能科学研究、系统开发与应用的创新创业人才。学生能够在交通、材料、生命科学等交叉领域从事与人工智能专业相关业务的开发和应用的拔尖人才。学生毕业后可在人工智能学科领域继续深造，为人工智能科学家做准备，或在相关行业和领域从事人工智能的研制、设计、开发、维护、管理等工作。

本专业期待毕业生经过五年左右的工作实践，具有的职业能力和取得的职业成就如下：

1. 具备扎实的数学、自然科学、人工智能、与工作岗位相关的法律和工程管理等方面的知识、良好的科学素养以及较强的工程实践能力。
2. 能够理解和分析与工作岗位相关的复杂工程问题，并能在人工智能的复杂工程设计、技术开发、科学研究、项目组织和管理等方面熟练应用与本专业相关的科学、技术及工程基础知识，经过五年的工作实践或继续深造成为企事业单位核心骨干；
3. 具备在职业工作和社会环境中自主学习能力和终身学习意识，紧跟人工智能的发展趋势，勇于创新，能够利用最新的技术手段和工具解决复杂工程问题中所遇到的技术难题，保持职业竞争力；
4. 践行社会主义核心价值观，具有良好的个人修养、社会公德和职业道德，具有较强的人文关怀精神与社会服务意识，能够在工作和社会上发挥积极的作用；
5. 具有国际视野，能在多学科多文化合作团队里工作，并能有效交流，具有良好的组织能力、决策能力与沟通协调能力。（英文翻译）

本专业期待毕业生经过五年左右的工作实践，具有的职业能力和取得的职业成就如下：

- 1.1. 工程知识:能够将数学、自然科学、计算、工程基础和专业知用于解决人工智能领域复杂工程问题。
2. 问题分析:能够应用数学、自然科学和工程科学的第一性原理，识别、表达并通过文献研究分析人工智能领域复杂工程问题，综合考虑可持续发展的要求，以获得有效结论。
3. 设计/开发解决方案:能够针对人工智能领域复杂工程问题开发和设计解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，体现创新性，并从健康与安全、全生命周期成本与净零碳要求、法律与伦理、社会与文化等角度考虑可行性。

2.1 Education Objectives

The major of Artificial Intelligence is oriented to the national economic and social development and the needs of the industry. It cultivates compound excellent talents with "strong adaptability, strong working

spirit and strong sense of innovation" who have comprehensive development of morality, intelligence and physical education, adapt to the needs of socialist modernization, systematically master the basic theoretical knowledge and skills of computer software and hardware, and have the ability of computer system research, design and development. After graduation, students can pursue further studies in related disciplines, or engage in research, management, design, development and testing of computer systems in Artificial Intelligence industry, scientific research departments, universities, and related fields. This major expects graduates to have the following professional abilities and achievements after about five years of work practice:

1. Have solid knowledge of mathematics, natural science, Artificial Intelligence technology, law and engineering management related to work position, good scientific literacy and strong engineering practice ability
2. Be able to understand and analyse the complex engineering problems related to the work position, and skillfully apply the basic knowledge of science, technology and engineering related to the major in the field of Artificial Intelligence technology, such as complex engineering design, technology development, scientific research, project organization and management. After five years of work practice or further study, become the core backbone of enterprises and institutions;
3. Have the self-learning ability and lifelong learning consciousness in the professional work and social environment, keep up with the development trend of Artificial Intelligence technology, have the courage to innovate, be able to use the latest technical means and tools to solve the technical problems encountered in complex engineering problems, and maintain the professional competitiveness;
4. Practice the socialism core values, have good personal cultivation, social morality and professional ethics, have strong humanistic care spirit and social service consciousness, can play a positive role in work and society;
5. With international vision, can work in multi-disciplinary and multi-cultural cooperation team, and can communicate effectively, with good organizational ability, decision-making ability and communication and coordination ability.

This major expects graduates to have the following professional abilities and achievements after about five years of work practice:

- 1.1. Able to apply mathematics, natural sciences, computation, engineering fundamentals, and specialized knowledge to solve complex engineering problems in the field of artificial intelligence.
2. Able to apply first principles from mathematics, natural sciences, and engineering sciences to identify, express, and analyze complex engineering problems in the field of artificial intelligence through literature research, considering sustainable development requirements to obtain effective conclusions.
3. Able to develop and design solutions for complex engineering problems in the field of artificial intelligence, designing systems, units (components), or processes that meet specific requirements, embodying innovation, and considering feasibility from perspectives such as health and safety, life cycle costs and net zero carbon requirements, legal and ethical considerations, social and cultural aspects.

(二) 毕业要求

本专业学生毕业时应当达到中国工程教育专业认证协会工程教育认证标准规定的的能力，即：

1. 工程知识： 1
2. 问题分析： 2
3. 解决方案： 3
4. 研究： 4
5. 工具使用： 5
6. 工程与社会：6
7. 环境和可持续发展：7
8. 职业规范：8
9. 个人和团队：9
10. 沟通：10

11. 项目管理:11

12. 终身学习:12

2.2 Graduation Requirements

Upon graduation, students in this major should meet the abilities required by the Engineering Education Certification Standards of the China Engineering Education Professional Certification Association, namely:

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附：培养目标实现矩阵

毕业要求	培养目标 1	培养目标 2	培养目标 3
毕业要求 1	√	√	
毕业要求 2	√	√	
毕业要求 3		√	√
毕业要求 4		√	√
毕业要求 5	√	√	√
毕业要求 6	√		√
毕业要求 7	√		√
毕业要求 8		√	
毕业要求 9		√	
毕业要求 10	√	√	
毕业要求 11		√	
毕业要求 12		√	

毕业要求的达成需以课程（教学环节）的教学活动为支撑。本专业为合理设置课程体系、落实对毕业要求的支撑课程，对各项毕业要求进行了解。每项毕业要求（一级指标）被分解为若干层层递进的指标点（二级指标），前一指标点的达成是下一指标点达成的基础，而下一指标点的达成是前一指标点的升华，所有指标点一起，支撑了该毕业要求的达成。根据上述分解方法，本专业各项毕业要求的指标点分解如下表所示。

表：毕业要求指标点的分解

毕业要求	指标点
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附：毕业要求实现矩阵

课程名称		人工智能专业毕业要求											
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
高级语言程序设计 A(10121117132)		H		H		M			M		M		
计算机科学导论(10121117133)			H			M	M	M			H	H	
专业教育与创新创业(10127317173)				H					H	H			
高等数学 A 上(10153121061)			H							M		H	
大学英语 1(10201121074)			M						M	M		H	
思想道德与法治(10211124001)									H	H	L	H	
中国近现代史纲要(10211124005)									H	H	L	H	
形势与政策(10218116001)									H	H	L	H	
体育 1(10271117046)									H	H		H	
军事技能训练(10381321003)									M			M	
通识教育选修课	“四史”类								H	H	L	H	
	人文社科类							M	H	H		H	
	科技创新类	M	H	H	M	M			H	H		H	
	经济管理类							M	H	H	M		
	创新创业类			M	M			H	H	H			
	艺术审美类								M	M			
	体育健康类								M			H	
备注：表中用“H”、“M”、“L” 分别表示该课程对指标点的支撑强度为“高”、“中”、“低”。													

三、专业核心课程

3 Core Courses

4 Course Schedule

4 Course Schedule

开课单位 Course College	课程编号 Course Number	课程名称 Course Title	学分 Crs	学时分配 Including						建议修读学期 Suggested Term	先修课程 Prerequisite Course
				总学时 Tot hrs.	理论 Theory	实验 Exp.	上机 Ope-ratio.	实践 Prac-tice.	课外 Extra-cur.		
（一）通识教育必修课程 1 General Education Compulsory Courses											
外国语学院	10201121074	大学英语 1 College English I	2	32	32	0	0	0	0	1	
马克思主义学院	10211124001	思想道德与法治 Morality and the rule of law	3	48	42	0	0	6	0	2	
马克思主义学院	10211124005	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	3	48	42	0	0	6	0	1	
马克思主义学院	10218116001	形势与政策 Situation & Policy	0.25	8	8	0	0	0	0	1	
体育学院	10271117046	体育 1 Physical Education I	1	32	32	0	0	0	0	1	
学生工作部（处）、武装部	10381321003	军事技能训练 Military Skills Training	2	136	0	0	0	136	0	1	
小 计 Subtotal			11.25	304	156	0	0	148	0		
修读说明： NOTE:											
（二）通识教育选修课程 2 General Education Elective Courses											
“四史”类 Education of "Four Histories"	1. 通识课程应修满至少 9 学分； 2. 至少修读“四史”课程以及创新创业类课程各 1 门； 3. 非艺术类专业学生还应在艺术审美类课程中至少选修 2 学分； 4. 学校引进开设的通识教育网络课程采用“学分认定”方式计入通识选修课，最高计入 4 学分。 5. 必须选修人文社科类中《国家安全教育》课程。 1. Elective courses ≥9 credits. 2. At least one course in Education of "Four Histories" and one course in innovation and entrepreneurship; 3. Non art major students should also take at least 2 elective credits in art aesthetics courses; 4. The general education online courses introduced by the school are included in the general education elective courses through credit recognition, with a maximum of 4 credits. 5. National Security Education of the Humanities and Social Sciences Courses is the specialized elective course										
人文社科类 Humanities and Social Sciences											
科技创新类 Technology innovation											
经济管理类 Economic Management											
创新创业类 Innovation and entrepreneurship											
艺术审美类 Art Aesthetics											
体育健康类											

Sports and Health											
小 计 Subtotal		9	144								
(三) 学科基础课程 3 Disciplinary Fundamental Courses											
计算机与人工智能学院	10121117132	高级语言程序设计 A High Level Language Programming A	3.5	56	44	12	0	0	0	1	
计算机与人工智能学院	10121117133	计算机科学导论 Introduction to Computer Science	2	32	24	8	0	0	0	1	
数学与统计学院	10153121061	高等数学 A 上 Advanced Mathematics A I	4.5	72	72	0	0	0	0	1	
小 计 Subtotal		10	160	140	20	0	0	0			
修读说明：											
NOTE：											
(四) 专业必修课程 4 Specialized Required Courses											
(五) 专业选修课程 5 Specialized Elective Courses											
(六) 个性课程 6 Personalized Elective Courses											
(七) 集中性实践教学环节 7 Specialized Practice Schedule											
(1) 集中性实践教学环节											
计算机与人工智能学院	10127317173	专业教育与创新创业 Introduction of Major and Innovation and Entrepreneurship	1	16	0	0	0	16	0	1	
小 计 Subtotal		1	16	0	0	0	16	0			
修读说明：											
NOTE：											

五、 修读指导

5 Recommendations on Course Studies

1. 课外培养方案详见《武汉理工大学第二课堂课外学分实施办法》。
2. 汉语授课本科层次国际学生汉语类课程修读要求详见《武汉理工大学本科层次国际学生公共汉语课程设置与修读要求》，其它课程修读与中国学生培养方案保持一致。
3. 各专业应不断强化劳动教育，将劳动要素融入专业教育，充分依托实习实训、社会调查等实践教学环节，设置劳动教育模块，标注含不少于 32 学时（2 学分）的劳动教育，明确劳动教育的目标、内容、形式和考核要求。

1.Please refer to the cultivation plan of the second class-Implementation Measures for Extracurricular Credits of the Second Class of Wuhan University of Technology.

2.Chinese courses for International students accepting Chinese teaching at undergraduate level can be found in detail the Public Chinese Curriculum and Study Requirements for International Students at undergraduate level of Wuhan University of Technology, and the study of other courses should be consistent with the undergraduate training program for Chinese students.

3.All majors should continue to strengthen labor education, integrate labor elements into specialty education, fully rely on practical teaching links such as practical training and social investigation, set up labor education modules, label labor education with no less than 32 class hours (2 credits), and clarify the goal, content, form and assessment requirements of labor education.

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附件：课程教学进程图

Annex: Teaching Process Map

