武器系统与工程

Weapon System and Engineering

一、专业基本信息

I. Basic information

类型（Type）：完全学分制

院系（Department）：兵器科学与技术学院Armament Science and Technology

专业（Major）：武器系统与工程Weapon System and Engineering

总学分（Total Credits）：162

学科门类（Field of Study）：工学Technology

专业类（Specialized Classification）：兵器类Weapon

专业代码（Major Code）：082101

授予学位（Degree）：工学学士Bachelor of Engineering

学制（Years of Study）：四年 Four years

主干学科（Primary Discipline）：兵器科学与技术Armament Science and Technology

相关学科（Related Discipline）：力学Dynamics, 机械工程Mechanical Engineering, 控制科学与工程Control Science and Engineering

大类名称（Specialty）：智能制造类

专业概况（Introduction of Major）：

武器系统与工程为西安工业大学五个国家级国防特色专业之一，于2018年正式招生。根据西安工业大学的学科优势和基础，本专业将智能武器系统作为主要培养方向。该专业方向与兵器科学与技术学科和人工智能的核心知识紧密关联，并涉及力学、机械、控制、电子等学科基础知识，专业知识覆盖智能武器系统组成与作用原理、智能武器设计、兵器制造、兵器测试技术等知识领域的核心内容。通过系统的培养，使学生具有智能武器工程设计、制造、试验测试等方面的基本能力，同时，具备机电工程领域的主要专业知识与工程实践能力，毕业生主要在国防工业部门从事智能武器研制、产品制造、性能测试、生产管理及部队相关智能武器装备技术保障等工作，也能够在地方智能制造部门从事智能机电产品设计、制造、质量检测、生产管理等方面的工作。

Weapon System and Engineering is one of the five national defense characteristic majors of Xi'an Technological University (XATU), which was officially enrolled in 2018. According to the disciplinary advantages and foundation of Xi'an University of Technology, this specialty takes intelligent weapon system as the main cultivation direction. This professional direction is closely related to the core

knowledge of the discipline of weapon science and technology and artificial intelligence, and involves the basic knowledge of mechanics, machinery, control, electronics and other disciplines, and the professional knowledge covers the core content of the knowledge areas of intelligent weapon system composition and functioning principle, intelligent weapon design, weapon manufacturing, weapon testing technology and other knowledge areas. Through systematic training, students have the basic ability of intelligent weapon engineering design, manufacturing, testing and testing, etc. Meanwhile, they have the main professional knowledge in the field of electromechanical engineering and engineering practice ability, and the graduates are mainly engaged in the development of intelligent weapons in the national defense industry sector, product manufacturing, performance testing, production management and related intelligent weapons and equipment technology to protect the troops, and are also able to engage in the local intelligent manufacturing sector. Graduates can also work in local intelligent manufacturing departments in intelligent electromechanical product design, manufacturing, quality testing, production management and other aspects of work.

二、培养目标

II.Educational Objectives

本专业面向国防工业和区域社会经济发展需求，培养德智体美劳全面发展，掌握扎实的数理基础知识与专业技能，能够在国防工业和智能制造业等相关领域从事智能武器装备和机电系统产品的设计研发、工艺技术、产品制造、质量保障、检验测试、运行管理等工作，具有终身学习能力、创新创业精神、国际视野、团队协作等的高素质人才。

学生毕业5年左右能够达到：

（1）能够综合运用数学与自然科学知识、武器装备工程、机电工程知识及现代科学工具系统性解决智能武器和机电工程问题，并能充分考虑环境、可持续性发展因素和社会综合影响；

（2）具有创新意识，能够适应国防工业及机电系统数字化、智能化发展趋势，承担智能武器和机电装备的研制、产品制造、性能测试、生产管理等工作；

（3）践行社会主义核心价值观，具有良好职业道德和保密意识，继承发扬兵工精神，能够将实现个人价值与推动国家武器装备和地方经济发展紧密结合，积极服务国家国防工业和地方经济；

（4）具有终身学习能力、国际视野，能够进行有效的技术交流、沟通与团队协作。

This major is oriented to the needs of regional economy, national defense industry and national artificial intelligence strategy, which can cultivates the student as senior specialists with a solid basic knowledge of mathematics and science, strong professional practical ability and excellent comprehensive qualities. The graduate can engage in the design and application of software and hardware related to artificial intelligence in the fields of national defense, public security, and information communication.Graduates can engage in the design and development, process technology, product manufacturing, quality assurance, inspection and testing, and operation management of intelligent weapon

equipment and electromechanical system products in related fields such as national defense industry and intelligent manufacturing industry. They are high-quality talents with lifelong learning ability, innovation and entrepreneurship spirit, international vision, teamwork, etc.

（1）To be able to use mathematics and natural science knowledge, weapons engineering knowledge and modern scientific tools to solve intelligent weapon engineering problems systematically.

（2）To be able to undertake the work of intelligent weapon research and development, product manufacturing, performance testing, production management and so on, and can fully consider the environment, sustainable development factors and social comprehensive influence.

（3）To have good professional ethics, have the military spirit, can realize personal value and promote the development of national weapons and equipment closely combined, willing to serve the national defense industry.

（4）To have a sense of innovation, lifelong learning ability and international perspective, be able to adapt to the digital and intelligent development trend of new weapons and equipment and its manufacturing process, and carry out effective technical exchanges under the cross-cultural background and team cooperation.

本专业面向国防工业和区域社会经济发展需求，培养德智体美劳全面发展，掌握 数学、物理、力学、电工电子技术、机械原理、信号与系统、数字信号处理、控制工程基础、机器学习、深度学习、传感器与检测技术、兵器测试技术、微机原理与接口技术、自主智能系统环境感知技术、智能化无人作战系统等知识，能够在国防工业和智能制造业 等相关领域从事智能武器装备和机电系统产品的设计研发、工艺技术、产品制造、质量保障、检验测试、运行管理等工作，具有终身学习能力、创新创业精神、国际视野、团队协作等的高素质人才

学生毕业5年左右能够达到：

（1）能够综合运用数学与自然科学知识、武器装备工程、机电工程知识及现代科学工具系统性解决智能武器和机电工程问题，并能充分考虑环境、可持续性发展因素和社会综合影响；

（2）具有创新意识，能够适应国防工业及机电系统数字化、智能化发展趋势，承担智能武器和机电装备的研制、产品制造、性能测试、生产管理等工作；

（3）践行社会主义核心价值观，具有良好职业道德和保密意识，继承发扬兵工精神，能够将实现个人价值与推动国家武器装备和地方经济发展紧密结合，积极服务国家国防工业和地方经济；

（4）具有终身学习能力、国际视野，能够进行有效的技术交流、沟通与团队协作。

（1）To be able to use mathematics and natural science knowledge, weapons engineering knowledge and modern scientific tools to solve intelligent weapon engineering problems systematically.

（2）Tobe able to undertake the work of intelligent weapon research and development, product manufacturing, performance testing, production management and so on, and can fully consider the environment, sustainable development factors and social comprehensive influence.

（3）To have good professional ethics, have the military spirit, can realize personal value and promote the development of national weapons and equipment closely combined, willing to serve the national defense industry.

（4）To have a sense of innovation, lifelong learning ability and international perspective, be able to adapt to the digital and intelligent development trend of new weapons and equipment and its manufacturing process, and carry out effective technical exchanges under the cross-cultural background and team cooperation.

三、毕业要求

III.Program Outcomes

0.思想品德：具有坚定正确的政治方向，热爱祖国，热爱人民，拥护中国共产党的领导；具有正确的世界观、人生观、价值观，具有良好的思想品德、健全的人格、健康的体魄，践行社会主义核心价值观。

0.1具有坚定的社会主义政治方向，拥护中国特色社会主义，拥护中国共产党的领导，热爱祖国、热爱人民；

0.2具有正确的世界观、人生观、价值观，具有为社会主义现代化建设服务的责任感和使命感，具有良好的思想品德和职业道德，具有健全的人格、健康的体魄，践行社会主义核心价值观。

1.工程知识：具备解决智能武器装备和机电工程复杂问题的数学、自然科学、工程基础和专业知识，并将其用于智能武器装备和机电的设计、制造、测试等工作中。

1.1能将数学、自然科学、工程科学的语言工具用于智能武器装备和机电工程问题的表述；

1.2能针对智能武器装备和其他机电控制系统建立数学模型并求解；

1.3能够将相关知识和数学模型方法用于分析智能武器装备和机电工程问题；

1.4能够将相关知识和数学模型方法用于智能武器装备和机电工程问题解决方案的比较与综合。

2.问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析智能武器装备和机电工程复杂问题，以获得有效结论。

2.1能运用相关科学原理，识别和判断智能武器装备和机电工程复杂问题的关键环节；

2.2能基于相关科学原理和数学模型方法正确表达智能武器装备和机电工程问题；

2.3能认识到解决智能武器装备和机电工程问题有多种方案可选择，会通过文献研究寻求可替代的解决方案；

2.4能运用数学、自然科学和工程科学基本原理，借助文献研究，分析过程的影响因素，获得有效结论。

3.设计/开发解决方案：能够设计针对智能武器装备和机电工程复杂问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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。

3.1掌握智能武器装备和机电工程设计和产品开发的基本设计/开发方法和技术，了解影响设计目

标和技术方案的各种因素；

3.2能够针对智能武器装备和机电控制系统的特定需求，完成单元（部件）的设计；

3.3能够进行智能武器装备和机电控制系统或加工工艺流程设计，在设计中体现创新意识；

3.4在智能武器装备和机电控制系统设计中能够考虑安全、健康、法律、文化及环境等制约因素。

4.研究：能够基于科学原理并采用科学方法对智能武器装备和机电工程复杂问题进行研究，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。

4.1能够基于科学原理，通过文献研究或相关方法，调研和分析智能武器装备和机电工程复杂问题的解决方案；

4.2能够根据智能武器装备和机电控制系统的特征，选择研究路线，设计实验方案；

4.3能够根据实验方案构建实验系统，安全地开展实验，正确地采集实验数据；

4.4能对实验结果进行分析和解释，并通过信息综合得到合理有效的结论。

5.使用现代工具：能够针对智能武器装备和机电工程复杂问题，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。

5.1了解智能武器装备和机电工程领域常用的现代仪器、信息技术工具、工程工具和模拟软件的使用原理和方法，并理解其局限性；

5.2能够选择与使用恰当的仪器、信息资源、工程工具和专业模拟软件，对智能武器装备和机电工程复杂问题进行分析、计算与设计；

5.3能够针对具体的对象，开发或选用满足特定需求的现代工具，模拟和预测智能武器装备和机电工程问题，并能够分析其局限性。

6.工程与社会：能够基于智能武器装备和机电工程相关背景知识进行合理分析，评价武器和机电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。

6.1了解智能武器装备和机电工程相关领域的技术标准体系、知识产权、产业政策和法律法规，理解不同社会文化对工程活动的影响；

6.2能分析和评价智能武器装备和机电工程实践对社会、健康、安全、法律、文化的影响，以及这些制约因素对项目实施的影响，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智能武器装备和机电工程复杂问题的工程实践对环境、社会可持续发展的影响。

7.1知晓和理解环境保护和可持续发展的理念和内涵；

7.2能够站在环境保护和可持续发展的角度思考智能武器装备和机电工程实践的可持续性，评价产品周期中可能对人类和环境造成的损害和隐患。

8.职业规范：具有人文社会科学素养、社会责任感，能够在智能武器装备和机电工程实践中理解并遵守工程职业道德和规范，具有保密意识，履行责任。

8.1有正确价值观，理解个人与社会的关系，了解中国国情和军情；

8.2理解诚实公正、诚信守责的工程职业道德规范，理解保密工作的要求，并能在工程实践中自觉遵守；

8.3理解工程师对公众的安全、健康和福祉，以及环境保护的社会责任，能够在智能武器装备和机电工程实践中自觉履行责任。

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。

9.1能与其他学科的成员有效沟通，合作共事；

9.2能够在团队中独立或合作开展工作；

9.3能够组织、协调和指挥团队开展工作。

10.沟通：能够就智能武器装备和机电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，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。

10.1能就智能武器装备和机电工程问题，以口头、文稿、图表等方式，准确表达自己的观点，回应质疑，理解与业界同行和社会公众交流的差异性；

10.2了解智能武器装备和机电工程领域的国际发展趋势、研究热点，理解和尊重世界不同文化的差异性和多样性；

10.3具备跨文化交流的语言和书面表达能力，能就智能武器装备和机电工程问题，在跨文化背景下进行基本沟通和交流。

11.项目管理：理解并掌握工程管理原理与经济决策方法，并能应用于智能武器装备和机电控制系统的设计、制造等实践中。

11.1掌握智能武器装备和机电工程项目中涉及的管理与经济决策方法；

11.2了解智能武器装备和机电工程及产品全周期、全流程的成本构成，理解其中涉及的工程管理与经济决策问题；

11.3能在多学科环境下（包括模拟环境），在设计开发解决方案的过程中，运用工程管理与经济决策方法。

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。

12.1能在社会发展和国防军事发展的大背景下，认识到自主和终身学习的必要性；

12.2具有自主学习的能力，包括对技术问题的理解能力，归纳总结的能力和提出问题的能力等。

0.Ideology and morality: Have a firm and correct political orientation, loving the motherland and the people, and supporting the leadership of the Communist Party of China; Have a correct outlook on the world, life, values, good ideological and moral character, sound personality, healthy body, practice the core socialist values.

0.1To have a firm socialist political orientation, supports socialism with Chinese characteristics and the leadership of the Communist Party of China, and loves the motherland and the people.

0.2To have a correct outlook on the world, life, values, good ideological and moral character, have a

sound personality, healthy body, practice the core socialist values.

1.**Engineering knowledge:**Possess ability of the mathematics, natural science, engineering foundation and professional knowledge required to solve complex intelligent equipment and mechanical engineering problems, and apply it to the design,manufacture and test practice.

1.1Able to use the language tools of mathematics, natural science and engineering science to describe the problems of intelligent , weapons and mechanical engineering.

1.2Able to build and solve mathematical models for intelligent weapons and other mechanical systems.

1.3Able to apply relevant knowledge and mathematical modeling methods to the analysis of intelligent armament and mechanical engineering problems.

1.4 Able to compare and synthesize solutions to intelligent armament and mechanical engineering problems using relevant knowledge and mathematical modeling methods.

2.**Problem analysis:**Graduates should have the abilities to identify, express and investigate complex intelligent engineering and mechanical engineering problems to obtain valid conclusions by employing the fundamental principles of mathematical, natural sciences, engineering science and by using literature.

2.1Able to use scientific principles to identify and judge key aspects of complex problems in intelligent weapons and mechanical engineering.

2.2Able to correctly express intelligent weapons and mechanical engineering problems based on relevant scientific principles and mathematical modeling methods.

2.3Able to recognize that there are multiple options for solving intelligent weapons and mechanical engineering problems, and seek alternative solutions through literature research.

2.4Able to use the basic principles of mathematics, natural science and engineering science, with the help of literature research, analyze the influencing factors of the process, and obtain effective conclusions.

3.**Design/development solutions projects:**Able to design solutions to intelligent engineering and mechanical engineering problems, design systems, units (parts) or processes to meet specific needs, and be innovative in the design process, taking into account social, health, safety, legal, cultural and environmental factors.

3.1Mastering the basic design/development methods and techniques of intelligent weapon equipment and mechanical engineering design and product development, understanding the various factors that affect design objectives and technical solutions.

3.2Able to design units for specific requirements of intelligent weaponry and mechanical systems.

3.3Able to design intelligent weapons and equipment, mechanical system or processing process flow, and embody innovation consciousness in design.

3.4Constraints such as safety, health, law, culture and environment can be considered in the design of

intelligent weapons and mechanical systems.

4.**Research:**Able to conduct research on complex intelligent engineering and mechanical engineering problems based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and drawing reasonable and effective conclusions through information synthesis.

4.1Able to research and analyze solutions to complex problems in intelligent weaponry and mechanical engineering based on scientific principles, through literature research or related methods.

4.2According to the characteristics of intelligent weapon equipment and mechanical system, select the research route and design the experimental scheme.

4.3Able to build the experimental system according to the experimental scheme, carry out the experiment safely and collect the experimental data correctly.

4.4Able to analyze and interpret the experimental results, and get reasonable and effective conclusions through information synthesis.

5.**Use modern tools:**Able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex intelligent engineering and mechanical engineeringproblem, including prediction and simulation of complex engineering problems and understanding their limitations.

5.1Understand the application principles and methods of modern instruments, information technology tools, engineering tools and simulation software commonly used in the field of intelligent weaponry and mechanical engineering, and understand their limitations.

5.2Able to select and use appropriate instruments, information resources, engineering tools and professional simulation software to analyze, calculate and design complex problems in intelligent weapons and mechanical engineering.

5.3Able to develop or select modern tools to meet specific needs for specific objects, to simulate and predict intelligent armament and mechanical engineering problems, and to analyze their limitations.

6.**Engineering and society:**Based on the background knowledge of intelligent engineering and mechanical engineering, analyze and evaluate the impact of professional intelligent and mechanical engineering practices and complex m intelligent and mechanical engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities that should be undertaken.

6.1Understand the technical standard system, intellectual property rights, industrial policies and laws and regulations in the fields related to intelligent , weaponry and mechanical engineering, and understand the influence of different social cultures on engineering activities.

6.2Able to analyze and evaluate the social, health, safety, legal, and cultural impacts of intelligent weaponry and mechanical engineering practices, as well as the impact of these constraints on project

implementation, and understand the responsibilities to be undertaken.

7.**Environment and sustainable development:**Able to understand and evaluate the impact of professional intelligent and mechanical engineering practices on the environmental protection and sustainable development.

7.1Know and understand the concept and connotation of environmental protection and sustainable development.

7.2To be able to think about the sustainability of intelligent equipment and mechanical engineering practice from the perspective of environmental protection and sustainable development, and to evaluate the possible damage and hidden danger to human beings and the environment in the product cycle.

8.**Professional norms:**Have humanistic and social science literacy and social responsibility, able to understand and abide by engineering professional ethics and norms in the practice of intelligent and mechanical engineering and fulfill the responsibilities.

8.1Have correct values, understand the relationship between individuals and society, understand China's national conditions and military conditions.

8.2Understand the engineering professional ethics of honesty, fairness and integrity, understand the requirements of confidentiality work, and can consciously abide by in the engineering practice.

8.3Understand the social responsibility of engineers for the safety, health and well-being of the public, as well as the protection of the environment, and be able to carry out their responsibilities in the practice of intelligent armament and mechanical engineering.

9.**Individuals and teams:**Able to assume the roles of individuals, team members, and leaders in a team with interdisciplinary backgrounds in intelligent , mechanics, control, and computers.

9.1Able to communicate effectively and work collaboratively with members of other disciplines.

9.2Able to work independently or cooperatively in a team.

10.**Communication:**Able to effectively communicate and communicate with industry colleagues and the public on complex intelligent and mechanical engineering issues, including writing reports and design manuscripts, making statements, expressing clearly or responding to instructions. And have a certain international perspective, able to communicate and exchange in a cross-cultural context.

10.1Able to accurately express opinions, respond to questions, and understand differences in communication with industry peers and the general public on intelligent , weaponry and mechanical engineering issues, orally, in writing, in diagrams, etc.

10.2To understand the international development trends and research hot spots in the field of intelligent , weapons and mechanical engineering, and to understand and respect the differences and diversity of different cultures in the world.

10.3Able to communicate in language and writing across cultures, and to communicate in a basic

cross-cultural context on intelligent , weaponry and mechanical engineering issues.

11.**Project management:**Able to understand and master the engineering management principles and economic decision-making methods in the practice of intelligent and mechanical engineering, and apply them to the design, production and improvement of intelligent and mechanical systems.

11.1Master the management and economic decision-making methods involved in intelligent weapon equipment and mechanical engineering projects.

11.2Understand the cost structure of the whole cycle and process of intelligent weapon equipment and mechanical engineering and products, and understand the engineering management and economic decision-making issues involved.

12.**Lifelong learning:**Have the consciousness of independent learning and lifelong learning, and have the ability to continuously learn and adapt to development.

12.1Recognize the need for self-directed and life-long learning in the context of social and military development.

12.2Have the ability of independent learning, including the ability to understand technical problems, the ability to summarize and the ability to put forward questions.

0.思想品德：具有坚定正确的政治方向，热爱祖国，热爱人民，拥护中国共产党的领导；具有正确的世界观、人生观、价值观，具有良好的思想品德、健全的人格、健康的体魄，践行社会主义核心价值观。

0.1具有坚定的社会主义政治方向，拥护中国特色社会主义，拥护中国共产党的领导，热爱祖国、热爱人民；

0.2具有正确的世界观、人生观、价值观，具有为社会主义现代化建设服务的责任感和使命感，具有良好的思想品德和职业道德，具有健全的人格、健康的体魄，践行社会主义核心价值观。

1.工程知识：具备解决智能武器装备和机电工程复杂问题的数学、自然科学、工程基础和专业知识，并将其用于智能武器装备和机电的设计、制造、测试等工作中。

1.1能将数学、自然科学、工程科学的语言工具用于智能武器装备和机电工程问题的表述；

1.2能针对智能武器装备和其他机电控制系统建立数学模型并求解；

1.3能够将相关知识和数学模型方法用于分析智能武器装备和机电工程问题；

1.4能够将相关知识和数学模型方法用于智能武器装备和机电工程问题解决方案的比较与综合。

2.问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析智能武器装备和机电工程复杂问题，以获得有效结论。

2.1能运用相关科学原理，识别和判断智能武器装备和机电工程复杂问题的关键环节；

2.2能基于相关科学原理和数学模型方法正确表达智能武器装备和机电工程问题；

2.3能认识到解决智能武器装备和机电工程问题有多种方案可选择，会通过文献研究寻求可替代的解决方案；

2.4能运用数学、自然科学和工程科学基本原理，借助文献研究，分析过程的影响因素，获得有效结论。

3.设计/开发解决方案：能够设计针对智能武器装备和机电工程复杂问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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。

3.1掌握智能武器装备和机电工程设计和产品开发的基本设计/开发方法和技术，了解影响设计目标和技术方案的各种因素；

3.2能够针对智能武器装备和机电控制系统的特定需求，完成单元（部件）的设计；

3.3能够进行智能武器装备和机电控制系统或加工工艺流程设计，在设计中体现创新意识；

3.4在智能武器装备和机电控制系统设计中能够考虑安全、健康、法律、文化及环境等制约因素。

4.研究：能够基于科学原理并采用科学方法对智能武器装备和机电工程复杂问题进行研究，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。

4.1能够基于科学原理，通过文献研究或相关方法，调研和分析智能武器装备和机电工程复杂问题的解决方案；

4.2能够根据智能武器装备和机电控制系统的特征，选择研究路线，设计实验方案；

4.3能够根据实验方案构建实验系统，安全地开展实验，正确地采集实验数据；

4.4能对实验结果进行分析和解释，并通过信息综合得到合理有效的结论。

5.使用现代工具：能够针对智能武器装备和机电工程复杂问题，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。

5.1了解智能武器装备和机电工程领域常用的现代仪器、信息技术工具、工程工具和模拟软件的使用原理和方法，并理解其局限性；

5.2能够选择与使用恰当的仪器、信息资源、工程工具和专业模拟软件，对智能武器装备和机电工程复杂问题进行分析、计算与设计；

5.3能够针对具体的对象，开发或选用满足特定需求的现代工具，模拟和预测智能武器装备和机电工程问题，并能够分析其局限性。

6.工程与社会：能够基于智能武器装备和机电工程相关背景知识进行合理分析，评价武器和机电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。

6.1了解智能武器装备和机电工程相关领域的技术标准体系、知识产权、产业政策和法律法规，理解不同社会文化对工程活动的影响；

6.2能分析和评价智能武器装备和机电工程实践对社会、健康、安全、法律、文化的影响，以及这些制约因素对项目实施的影响，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智能武器装备和机电工程复杂问题的工程实践对环境、社会可持续发展的影响。

7.1知晓和理解环境保护和可持续发展的理念和内涵；

7.2能够站在环境保护和可持续发展的角度思考智能武器装备和机电工程实践的可持续性，评价产品周期中可能对人类和环境造成的损害和隐患。

8.职业规范：具有人文社会科学素养、社会责任感，能够在智能武器装备和机电工程实践中理解并遵守工程职业道德和规范，具有保密意识，履行责任。

8.1有正确价值观，理解个人与社会的关系，了解中国国情和军情；

8.2理解诚实公正、诚信守责的工程职业道德规范，理解保密工作的要求，并能在工程实践中自觉遵守；

8.3理解工程师对公众的安全、健康和福祉，以及环境保护的社会责任，能够在智能武器装备和机电工程实践中自觉履行责任。

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。

9.1能与其他学科的成员有效沟通，合作共事；

9.2能够在团队中独立或合作开展工作；

9.3能够组织、协调和指挥团队开展工作。

10.沟通：能够就智能武器装备和机电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，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。

10.1能就智能武器装备和机电工程问题，以口头、文稿、图表等方式，准确表达自己的观点，回应质疑，理解与业界同行和社会公众交流的差异性；

10.2了解智能武器装备和机电工程领域的国际发展趋势、研究热点，理解和尊重世界不同文化的差异性和多样性；

10.3具备跨文化交流的语言和书面表达能力，能就智能武器装备和机电工程问题，在跨文化背景下进行基本沟通和交流。

11.项目管理：理解并掌握工程管理原理与经济决策方法，并能应用于智能武器装备和机电控制系统的设计、制造等实践中。

11.1掌握智能武器装备和机电工程项目中涉及的管理与经济决策方法；

11.2了解智能武器装备和机电工程及产品全周期、全流程的成本构成，理解其中涉及的工程管理与经济决策问题；

11.3能在多学科环境下（包括模拟环境），在设计开发解决方案的过程中，运用工程管理与经济决策方法。

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。

12.1能在社会发展和国防军事发展的大背景下，认识到自主和终身学习的必要性；

12.2具有自主学习的能力，包括对技术问题的理解能力，归纳总结的能力和提出问题的能力等。

0.Ideology and morality: Have a firm and correct political orientation, loving the motherland and the

people, and supporting the leadership of the Communist Party of China; Have a correct outlook on the world, life, values, good ideological and moral character, sound personality, healthy body, practice the core socialist values.

0.1To have a firm socialist political orientation, supports socialism with Chinese characteristics and the leadership of the Communist Party of China, and loves the motherland and the people.

0.2To have a correct outlook on the world, life, values, good ideological and moral character, have a sound personality, healthy body, practice the core socialist values.

1.**Engineering knowledge:**Possess ability of the mathematics, natural science, engineering foundation and professional knowledge required to solve complex intelligent equipment and mechanical engineering problems, and apply it to the design,manufacture and test practice.

1.1Able to use the language tools of mathematics, natural science and engineering science to describe the problems of intelligent , weapons and mechanical engineering.

1.2Able to build and solve mathematical models for intelligent weapons and other mechanical systems.

1.3Able to apply relevant knowledge and mathematical modeling methods to the analysis of intelligent armament and mechanical engineering problems.

1.4 Able to compare and synthesize solutions to intelligent armament and mechanical engineering problems using relevant knowledge and mathematical modeling methods.

2.**Problem analysis:**Graduates should have the abilities to identify, express and investigate complex intelligent engineering and mechanical engineering problems to obtain valid conclusions by employing the fundamental principles of mathematical, natural sciences, engineering science and by using literature.

2.1Able to use scientific principles to identify and judge key aspects of complex problems in intelligent weapons and mechanical engineering.

2.2Able to correctly express intelligent weapons and mechanical engineering problems based on relevant scientific principles and mathematical modeling methods.

2.3Able to recognize that there are multiple options for solving intelligent weapons and mechanical engineering problems, and seek alternative solutions through literature research.

2.4Able to use the basic principles of mathematics, natural science and engineering science, with the help of literature research, analyze the influencing factors of the process, and obtain effective conclusions.

3.**Design/development solutions projects:**Able to design solutions to intelligent engineering and mechanical engineering problems, design systems, units (parts) or processes to meet specific needs, and be innovative in the design process, taking into account social, health, safety, legal, cultural and environmental factors.

3.1Mastering the basic design/development methods and techniques of intelligent weapon equipment and mechanical engineering design and product development, understanding the various factors that affect

design objectives and technical solutions.

3.2Able to design units for specific requirements of intelligent weaponry and mechanical systems.

3.3Able to design intelligent weapons and equipment, mechanical system or processing process flow, and embody innovation consciousness in design.

3.4Constraints such as safety, health, law, culture and environment can be considered in the design of intelligent weapons and mechanical systems.

4.**Research:**Able to conduct research on complex intelligent engineering and mechanical engineering problems based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and drawing reasonable and effective conclusions through information synthesis.

4.1Able to research and analyze solutions to complex problems in intelligent weaponry and mechanical engineering based on scientific principles, through literature research or related methods.

4.2According to the characteristics of intelligent weapon equipment and mechanical system, select the research route and design the experimental scheme.

4.3Able to build the experimental system according to the experimental scheme, carry out the experiment safely and collect the experimental data correctly.

4.4Able to analyze and interpret the experimental results, and get reasonable and effective conclusions through information synthesis.

5.**Use modern tools:**Able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex intelligent engineering and mechanical engineering problem, including prediction and simulation of complex engineering problems and understanding their limitations.

5.1Understand the application principles and methods of modern instruments, information technology tools, engineering tools and simulation software commonly used in the field of intelligent weaponry and mechanical engineering, and understand their limitations.

5.2Able to select and use appropriate instruments, information resources, engineering tools and professional simulation software to analyze, calculate and design complex problems in intelligent weapons and mechanical engineering.

5.3Able to develop or select modern tools to meet specific needs for specific objects, to simulate and predict intelligent armament and mechanical engineering problems, and to analyze their limitations.

6.**Engineering and society:**Based on the background knowledge ofintelligent engineering andmechanical engineering, analyze and evaluate the impact of professional intelligent and mechanical engineering practices and complex m intelligent and mechanical engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities that should be undertaken.

6.1Understand the technical standard system, intellectual property rights, industrial policies and laws

and regulations in the fields related to intelligent , weaponry and mechanical engineering, and understand the influence of different social cultures on engineering activities.

6.2Able to analyze and evaluate the social, health, safety, legal, and cultural impacts of intelligent weaponry and mechanical engineering practices, as well as the impact of these constraints on project implementation, and understand the responsibilities to be undertaken.

7.**Environment and sustainable development:**Able to understand and evaluate the impact of professional intelligent and mechanical engineering practices on the environmental protection and sustainable development.

7.1Know and understand the concept and connotation of environmental protection and sustainable development.

7.2To be able to think about the sustainability of intelligent equipment and mechanical engineering practice from the perspective of environmental protection and sustainable development, and to evaluate the possible damage and hidden danger to human beings and the environment in the product cycle.

8.**Professional norms:**Have humanistic and social science literacy and social responsibility, able to understand and abide by engineering professional ethics and norms in the practice of intelligent and mechanical engineering and fulfill the responsibilities.

8.1Have correct values, understand the relationship between individuals and society, understand China's national conditions and military conditions.

8.2Understand the engineering professional ethics of honesty, fairness and integrity, understand the requirements of confidentiality work, and can consciously abide by in the engineering practice.

8.3Understand the social responsibility of engineers for the safety, health and well-being of the public, as well as the protection of the environment, and be able to carry out their responsibilities in the practice of intelligent armament and mechanical engineering.

9.**Individuals and teams:**Able to assume the roles of individuals, team members, and leaders in a team with interdisciplinary backgrounds in intelligent , mechanics, control, and computers.

9.1Able to communicate effectively and work collaboratively with members of other disciplines.

9.2Able to work independently or cooperatively in a team.

10.**Communication:**Able to effectively communicate and communicate with industry colleagues and the public on complex intelligent and mechanical engineering issues, including writing reports and design manuscripts, making statements, expressing clearly or responding to instructions. And have a certain international perspective, able to communicate and exchange in a cross-cultural context.

10.1Able to accurately express opinions, respond to questions, and understand differences in communication with industry peers and the general public on intelligent , weaponry and mechanical engineering issues, orally, in writing, in diagrams, etc.

10.2To understand the international development trends and research hots pots in the field of intelligent , weapons and mechanical engineering, and to understand and respect the differences and

diversity of different cultures in the world.

10.3Able to communicate in language and writing across cultures, and to communicate in a basic cross-cultural context on intelligent , weaponry and mechanical engineering issues.

11.**Project management:**Able to understand and master the engineering management principles and economic decision-making methods in the practice of intelligent and mechanical engineering, and apply them to the design, production and improvement of intelligent and mechanical systems.

11.1Master the management and economic decision-making methods involved in intelligent weapon equipment and mechanical engineering projects.

11.2Understand the cost structure of the whole cycle and process of intelligent weapon equipment and mechanical engineering and products, and understand the engineering management and economic decision-making issues involved.

12.**Lifelong learning:**Have the consciousness of independent learning and lifelong learning, and have the ability to continuously learn and adapt to development.

12.1Recognize the need for self-directed and life-long learning in the context of social and military development.

12.2Have the ability of independent learning, including the ability to understand technical problems, the ability to summarize and the ability to put forward questions.

四、毕业条件及学位授予要求

IV.Graduation Requirements and Degree Awarding Requirements

在修业年限内修完本专业规定课程，获得的总学分不低于 150+X 学分、第二课堂学分不低于7学分（须通过《Python 语言程序设计》课程考核获得 1 学分），且通过《国家学生体质健康标准》合格测试，方可准予毕业。

注：X 学分包含通识选修课程、专业选修课程、自选课程，根据个人职业发展意愿，修读 12-20 学分。其中，通识选修课程应至少修读各模块要求的最低学分（不少于 7 学分）。

达到毕业要求，且符合《西安工业大学学士学位授予工作细则》，授予工学学士学位。

Only after completing the required courses within the length of study, and obtaining the total credits of no less than 150+X and the second classroom credits of no less than 7 (must passing the examination of "Python Language Programming" course and earn 1 credit), passing the qualification test of "National Student Physical Health Standard" can be allowed to graduate.

Note: X credits include general education elective courses, professional elective courses, and self selected courses. According to personal career development wishes, 10-15 credits are taken. Among them, general education elective courses should take at least the minimum credits required for each module (not less than 7 credits).

To meet the graduation requirements, and in line with the "Working Rules for the Bachelor Degree Awarding of Xi'an Technological University", can be awarded a Bachelor of Engineering.

五、课程体系

V.Curriculum System

分类 Course Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
通识教育	通识必修	180001	1思想道德与法治 Morality and the Rule of Law	3	48		40	8			1	是	考查	否	
		180006	2形势与政策-1 Current Affair and PolicyI	0	8		8				1	是			
		230006	3大学生职业生涯规划 Career Planning of College Students	0.5	20		20				1	是	考查	否	
		230018	4计算思维与人工智能基础（工） Computational Thinking and Artificial Intelligence Fundamentals (Engineering)	1	32		24		8		1	是	考试	否	
		230023	5Python语言程序设计 Python language programming	0	32					32	1	是	考查	否	
		230026	6军事理论 Military Theory	2	36		36				1	是	考查	否	
		230062	7现代工程导论 Introduction to Modern Engineering	0.25	8		8				1	是	考查	否	
		230065	8工程伦理与安全 Engineering Ethics and Safety	0.25	8		8				1	是	考查	否	
		230066	9大学英语Ⅰ College English Ⅰ	2	64		64				1	是	考试	否	
		180007	10形势与政策-2 Current Affair and Policy II	0	8		8				2	是			
		230063	11数字化思维与技术基础（理工） Fundamentals of Digital Literacy（STEM）	0.25	8		8				2	是	考查	否	
		230067	12大学英语Ⅱ College English Ⅱ	2	64		64				2	是	考试	否	
		550002	13大学生心理健康教育 Mental Health Education for College Students	2	32		32				2	是	考查	否	
		9811	14中国近现代史纲要 Outline of China's Modern History	3	48		40	8			2	是	考试	否	

分类 Course Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
		180008	15形势与政策-3 Current Affair and Policy III	0	8		8				3	是			
		4983	16马克思主义基本原理 The Basic Principles of Marxism	3	48		40	8			3	是	考试	否	
		020121	17工程经济与项目管理 Engineering Economics and Project Management	0.5	16		16				4	是	考查	否	
		050177	18创新创业学 Innovation and Entrepreneurship	1	32		32				4	是	考查	否	
		180003	19毛泽东思想和中国特色社会主义理论体系概论 Introduction of Mao Zedong Thought and Theory System of Socialism with Chinese Characteristics	3	48		40	8			4	是	考试	否	
		180009	20形势与政策-4 Current Affair and Policy IV	0	8		8				4	是			
		180004	21习近平新时代中国特色社会主义思想概论 Introduction of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	3	48		40	8			5	是	考试	否	
		050178	23企业（军工）管理 Enterprise (Military Industry) Management	0.75	24		24				6	是	考查	否	
		230007	25大学生就业指导 Employment Guidance for College Students	0.5	18		18				6	是	考查	否	
		180005	27形势与政策 Current Affair and Policy	2	0						8	是			
		学分小计		30							1(9),2(7.25),3(3),4(4.5),5(3),6(1.25),7(0),8(2)				
	通识限选	230027	29体育I Physical Education Ⅰ	1	36		36				1	是	考查	否	

分类 Course Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
		230028	30体育Ⅱ Physical EducationⅡ	1	36		36				2	是	考查	否	
		230029	31体育Ⅲ Physical EducationⅢ	0.5	18		18				3	是	考查	否	
		230030	32体育Ⅳ Physical EducationⅣ	0.5	18		18				4	是	考查	否	
		230031	33体育Ⅴ Physical Education Ⅴ	0.5	18		18				5	是	考查	否	
		230032	34体育Ⅵ Physical EducationⅥ	0.5	18		18				6	是	考查	否	
		230008	35大学英语拓展课 Expanding Course of College English	2	32		32				3	否	考试	否	按要求修2学分，大学英语Ⅲ、大学英语Ⅳ：四级未通过选；大学英语拓展课：四级通过选
		230056	36大学英语Ⅲ College English Ⅲ	1	32		32				3	否	考试	否	
		230057	37大学英语Ⅳ College English Ⅳ	1	32		32				4	否	考试	否	
		学分小计		6							1(1),2(1),3(0.5),4(0.5),5(0.5),6(0.5)				
	通识选修	通识选修-文化传承		0.5											
		通识选修-“四史”教育		0.5											
		通识选修-国际视野		0.5											
		通识选修-社会责任		0.5											
		通识选修-美学修养		2	学生须取得“美学修养”模块2个学分方可毕业，其中“美学和艺术史论类”、“艺术鉴赏和评论类”课程至少取得1个学分。										

分类 Course Category	课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
		通识选修-健康生活	0.5											
		通识选修-科技革新	0.5											
		通识选修-创新创业	0.5											
		通识选修-国防军工	0.5											
		通识选修-劳动教育	1											
		学分小计	7	要求学生至少修得7学分，且满足每个模块的应修学分要求。										
	学分小计		43							1(10),2(8.25),3(3.5),4(5),5(3.5),6(1.75),7(0),8(2)				
学科基础	0051	38高等数学AⅠ Advanced Mathematics AⅠ	5.5	88		88				1	是	考试		
	9886	39工程图学基础 Engineering Graphics	2.5	40		40				1	是	考试	否	
	0052	40高等数学AⅡ Advanced Mathematics AⅡ	5.5	88		88				2	是	考试	否	
	0073	41大学物理Ⅰ College Physics Ⅰ	3	48		48				2	是	考试	否	
	0101	42线性代数 Linear Algebra	2.5	40		40				2	是	考试	否	
	230021	43C语言程序设计 C language programming	1.5	48		32		16		2	是	考试	否	
	0065	44概率与数理统计 Probability Theory and Mathematical Statistics	3	48		48				3	是	考试	否	
	0069	45复变函数与积分变换 Complex Variable Function and Integral Transformation	3	48		48				3	是	考试	否	
	0074	46大学物理Ⅱ College Physics Ⅱ	3	48		48				3	是	考试	否	
	3858	47工程力学A Engineering Mechanics A	4	64		58	6			3	是	考试	否	
	2431	48电工电子技术 Electrical and Electronic Technology	3.5	56		56				4	是	考试	否	
	学分小计		37							1(8),2(12.5),3(13),4(3.5)				

分类 Course Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
专业教育		250105	49武器系统与工程专业导论 Weapon system and Engineering	1.25	24		24				2	是	考查		
		1130	50机械制图 Mechanical Drawing	3	48		40		8		3	是	考查	否	
		1294	51机械原理 Mechanical Principles	3	48		48				4	是	考试		
		250002	52信号与系统 Signals and Systems	3.5	56		56				4	是	考试		
		600008	53工程材料与机械制造基础（双语） Fundamentals of Mechanical Manufacturing (Bilingual)	2.5	40		40				4	是	考试	否	
		020050	54流体力学与流体传动 Fluid Mechanics and Fluid Transmission	3	48		48				5	是	考试	否	
		1116	55控制工程基础 Basis of Control Engineering	2.5	40		40				5	是	考试	否	
		250100	56数字信号处理 Digital Signal Processing	2	32		32				5	是	考试	否	
		9732	57机械设计 Mechanic Design	3	48		48				5	是	考试		专业劳动教育依托课程
		020006	58兵器测试技术 Weapon Test Technology	2	32		32				6	是	考试		
		250099	59传感器与检测技术 Sensor and detection Technology	3	48		40	8			6	是	考试	否	
		250106	60武器系统与工程学科前沿讲座 Weapon system and Engineering Lectures on Discipline Frontier	1	16		16				6	是	考查	否	
		学分小计		29.75							2(1.25),3(3),4(9),5(10.5),6(6)				
实践教育	实践必修	210001	61军训 Military Training	2		2周					1	是	考查	否	
		9014	62入学教育 Entrance Education	0	8					8	1	是	考查	否	
		230024	63大学物理实验I College Physics Experiment I	0.75	24			24			3	是	考查	否	
		230025	64大学物理实验II College Physics Experiment II	0.75	24			24			4	是	考查	否	

分类 Course Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
		250103	65武器系统与工程专业毕业设计 Graduation thesis of weapon system and engineering	18		18周					8	是	考查	否	劳动教育依托课程。
		9015	66毕业教育 Graduation Education	0	8					8	8	是	考查	否	
		学分小计		21.5							1(2),3(0.75),4(0.75),8(18)				
	实践限选	0310	67理科创新思维实训 Innovation and Entrepreneurship (Science)	0.5	16		16				2	是	考查	否	劳动教育依托课程。
		040148	68电工电子实验 Electrical and Electronic Experiments	0.5	16			16			3	是	考查	否	
		2067	69电装实习B Electrical Practice B	1		1周					3	是	考查	否	劳动教育依托课程。
		600022	70工程训练-基础工程训练2 Basic Engineering Training II	0.5	16			16			3	是	考查	否	劳动教育依托课程。
		600025	71工程训练-现代制造技术3 Modern Manufacturing Technology III	0.5	16			16			3	是	考查	否	劳动教育依托课程。
		1436	72专业基础实验I Basis of Mechanical Designing Experiment	0.5	8			8			4	是	考查	否	
		600011	73智能制造创新创业实训-小型机电系统操作与拆装 intelligent Manufacturing Innovation and Entrepreneurship Training-Operation and Disassembly of Smal	0.25	8			8			4	是	考查	否	劳动教育依托课程。
		600012	74智能制造创新创业实训-移动机器人避障与路径规划 intelligent Manufacturing Innovation and Entrepreneurship Training-Mobile Robot Obstacle Avoidance a	0.25	8			8			4	是	考查	否	劳动教育依托课程。
		600016	75智能制造创新创业实训-智能制造产线基	0.25	8			8			4	是	考查	否	劳动教育依托课

分类 Course Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
			础实训 Basic Practical Training of intelligent Manufacturing Production Line												程。
		600017	76智能制造创新创业实训-工业机器人基本操作与虚拟仿真 Basic Operations and Virtual Simulation of Industrial Robots	0.25	8			8			4	是	考查	否	劳动教育依托课程。
		600026	77工程训练-协同创作及制造技术 Collaborative Creation and Manufacturing Technology	0.5	16			16			4	是	考查	否	劳动教育依托课程。
		1437	78专业基础实验II Professional Basic Experiment Ⅱ	1.5	24			24			5	是	考查	否	
		1298	79生产实习 Production Practice	3		3周					6	是	考查	否	劳动教育依托课程。
		1438	80专业基础实验III Professional basic experiment III	1	16			16			6	是	考查	否	
		250012	81人工智能创新创业实训 Innovation and Entrepreneurship Training	1		1周					7	是	考查	否	
		学分小计		11.5							2(0.5),3(2.5),4(2),5(1.5),6(4),7(1)				
	实践选修	1297	82机械原理课程设计 Design of Mechanical Engineering Principle Course	1		1周					4	否	考查	否	
		1354	83机械设计课程设计 Design of Machine Elements Course	2		2周					5	否	考查	否	
		020043	84机电控制子系统综合设计实践 Integrated Design Practice of Electromechanical Control Subsystem	3		3周					7	否	考查	否	
		应修学分		6											
	学分小计			39							1(2),2(0.5),3(3.25),4(2.75),5(				

分类 Course Category		课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
											1.5),6(4),7(1),8(18)				
个性化发展	专业选修课	250023	85人工智能技术及其军事应用 Artificial Intelligence Technology and its Military Applications	2	32		32				7	否	考查	否	三选二
		250024	86自主智能系统环境感知技术 Environmental Perception Technology of Autonomous intelligent System	2	32		32				7	否	考查	否	
		250025	87智能化无人作战系统 intelligent Unmanned combat system	2	32		32				7	否	考查	否	
		250062	88机器学习 Machine Learning	3	48		32		16		5	否	考试	否	二选一（“机器学习”与“深度学习”搭配）
		8509	89机器人学基础 Fundamentals of Robotics	3	48		48				5	否	考试	否	
		060010	90深度学习 Deep learning	3	48		32	16			6	否	考查	否	二选一（“机器学习”与“深度学习”搭配）
		250069	91图像处理与模式识别 Computer Image Processing and Recognition Technology	3	48		32	16			6	否	考试	否	
		1489	92Matlab仿真与优化 Matlab Simulation and Optimization	1	16		16				7	否	考查	否	四选一
		1490	93Solidworks三维建模技术 Solidworks 3D Modeling Technology	1	16		16				7	否	考查	否	
		1491	94Ansys有限元分析 Ansys Finite Element Analysis	1	16		16				7	否	考查	否	
		1496	95Altium电子设计自动化 Altium Electronic Design Automation	1	16		16				7	否	考查	否	
		学分小计		11											
	自选课程			2.25	结合智能武器系统方向，选择人工智能或探测制导与控制技术专业相关课程，至少修2学分										
	学分小计			13.25											
全程总计				162							1(20),2(22.5),				

分类 Course Category	课程代码 Course Code	课程名称 Course Name	学分 Credit	总学时 Total Semester Hour	周数 Total Weeks	理论学时 Semester Hour of Theory Course	实验学时 Semester Hour of Experiment	上机学时 Semester Hour of Program	其他学时 Rest Semester Hour	建议修读学期 Recommendation of Study Semester	是否必修 Required course	考核方式 Evaluation Methods	是否核心课 Required or Elective Course	备注 Remarks
										3(22.75), 4(20.25), 5(15.5), 6(11.75), 7(1), 8(20)				

六、学分分配

VI.Credit Allocation

表1 课程模块学分分配表

课程模块 Course Module	通识教育课程 General Education Courses	学科基础课程 Subject Basic Courses	专业教育课程 Discipline Courses	实践教育课程 Practical Courses	个性化发展课程 Personalized Development Courses	合计 Total
学分 Credits	43	37	29.75	39	13.25	162
占比（%） Percentage	26.5%	22.8%	18.4%	24.1%	8.2%	100%

表2 课程类别学分分配表

课程类别 Course Category	必修课学分 Required Courses Credits		选修课程学分 Elective Courses Credits		理论教学学分 Theoretical Teaching Credits	实践教学学分 Experimental Teaching Credits	
	含限选课学分	不含限选课学分	不含限选课学分	含限选课学分		课内实验学分	不含课内实验实践教学学分
学分 Credits	146.75	135.25	15.25	9.25	114.62	8.38	39
占比（%） Percentage	90.6%	83.5%	9.4%	5.7%	70.8%	5.2%	24.1%

七、教学计划

VII.Teaching Schedule

1.学期周学时分配表

Weekly Study Hours

学期 Term	一	二	三	四	五	六	七	八
周学时 Weekly Study Hours	24.2	24.2	26.1	22.8	15.6	11.2	0.5	

2.教学进程

Schedule

学年 Academic Year	学期 Term	各学期教学内容 Teaching Activities in Each Term																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
一	1	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	:	=	=	=	=	=	=

学年 Academic Year	学期 Term	各学期教学内容 Teaching Activities in Each Term																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	:	=	=	=	=	=	=
二	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<	<	<	:	=	=	=	=	=	=
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	:	=	=	=	=	=	=
三	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<	<	:	=	=	=	=	=	=
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	:	@	@	@	=	=	=	=	=	=
四	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	:	<	<	<	<	=	=	=	=	=
	8	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	>	B	J	=	=	=	=	=	=

图例：* 入学教育 - 理论教学 : 考试 <课程设计 θ 写生 = 假期 S 教学实习 O 金工实习 $ 社会调查 X 学年论文 ！测绘 @ 生产实习 J 机动 + 军训 >毕业设计 &毕业实习 B 毕业教育 Z 专业实训

Legend: * Orientation - Theory Teaching : Examination <Course Project θ Sketch = Vacation S Teaching Practice O Metalworking Practice $ Social Survey X Term Paper ! Mapping @ Production Practice J Mobility + Military Training >Graduation Project/Paper &Graduation Internship B Graduation Education Z Professional Training

八、毕业要求支撑培养目标矩阵图

VIII.Matrix of Graduation Requirements Supporting Training Objectives

	培养目标1	培养目标2	培养目标3	培养目标4
思想品德			√	
工程知识	√	√		√
问题分析	√	√		√
设计/开发解决方案	√	√		√
研究	√	√		
使用现代工具	√	√		√
工程与社会	√		√	
环境和可持续发展	√			
职业规范			√	
个人和团队				√
沟通				√
项目管理		√		
终身学习				√

注：表格中毕业要求对培养目标的支撑用√表示。

九、课程体系支撑毕业要求矩阵图

IX.Matrix diagram of Graduation Requirements Supported by Curriculum System

分类		课程名称	0 思想品德		1 工程知识				2 问题分析				3 设计/开发解决方案				4 研究				5 使用现代工具			6 工程与社会		7 环境和可持续发展		8 职业规范			9 个人和团队			10 沟通			11 项目管理			12 终身学习	
			0.1	0.2	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	9.3	10.1	10.2	10.3	11.1	11.2	11.3	12.1	12.2
通识教育	通识必修	96思想道德与法治	H	H																				L				M	L											
		98大学生职业生涯规划	L	M																								L											L	M
		99计算思维与人工智能基础（工）	L	L																	M																				
		100Python语言程序设计	L	L																	L	L																			
		101军事理论	L	L																																					
		102现代工程导论	L	L																								L										L		L	
		103工程伦理与安全	L	M																					L		L		M	H											
		104大学英语Ⅰ	L	L																														M	H						
		106数字化思维与技术基础（理工）	L	L																										L									L	H
		107大学英语Ⅱ	L	L																														M	H						
		108大学生心理健康教育	L	M																																					
		109中国近现代史纲要	H	H																								H													
		111马克思主义基本原理	H	H																								H													
		112工程经济与项目管理	L	L																																	H	M	L		
		113创新创业学	L	L											L	L								M																	
		114毛泽东思想和中国特色社会主义理论体系概论	H	H																						L		H													

分类	课程名称	0 思想品德		1 工程知识				2 问题分析				3 设计/开发解决方案				4 研究				5 使用现代工具			6 工程与社会		7 环境和可持续发展		8 职业规范			9 个人和团队			10 沟通			11 项目管理			12 终身学习	
		0.1	0.2	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	9.3	10.1	10.2	10.3	11.1	11.2	11.3	12.1	12.2
	116习近平新时代中国特色社会主义思想概论	H	H																						M		H													
	118企业（军工）管理	L	L																				L													H	M			
	120大学生就业指导	L	M																												L	M							
	122形势与政策	M	M																						L		L													
通识限选	124体育I	L	H																											L	L								
通识限选	125体育II	L	H																											L	L								
通识限选	126体育III	L	H																											L	L								
通识限选	127体育IV	L	H																											L	L								
通识限选	128体育V	L	H																											L	L								
通识限选	129体育VI	L	H																											L	L								
通识限选	130大学英语拓展课	L	L																															M	H					
通识限选	131大学英语III	L	L																															M	H					
通识限选	132大学英语IV	L	L																															M	H					
通识选修	通识选修-文化传承	L																									L											L	
通识选修	通识选修-“四史”教育	L																									L												
通识选修	通识选修-国际视野		L																																L					L
通识选修	通识选修-社会责任	L																							L		L													
通识选修	通识选修-美学修养		L																																			L	
通识选修	通识选修-健康生活		L																																			L	
通识选修	通识选修-科技革新		L																																			L	
通识选修	通识选修-创新创业		L																				L								L				L				
通识选修	通识选修-国防军工	L																																		L			

分类	课程名称	0 思想品德		1 工程知识					2 问题分析				3 设计/开发解决方案				4 研究				5 使用现代工具			6 工程与社会		7 环境和可持续发展		8 职业规范			9 个人和团队			10 沟通			11 项目管理			12 终身学习	
		0.1	0.2	1.1	1.2	1.3	1.4		2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	9.3	10.1	10.2	10.3	11.1	11.2	11.3	12.1	12.2
	通识选修-劳动教育		L																					L							L										
学科基础	133高等数学AⅠ	L	L	H	M					L																															
	134工程图学基础																							H									M								
	135高等数学AⅡ	L	L	H	M					L																															
	136大学物理Ⅰ	L	L	H						L																															
	137线性代数	L	L	H	M					L																															
	138C语言程序设计	L	L																		H	H																			
	139概率与数理统计	L	L	H	M					L																															
	140复变函数与积分变换	L	L		M					M																															
	141大学物理Ⅱ	L	L	H						L																															
	142工程力学A	L			H				H								H	H	M																						
	143电工电子技术				H				H					H				L																							
专业教育	144武器系统与工程专业导论		L																					M		L														
	145机械制图		L																			H		M									L								
	146机械原理		L			H			L	M	M		M																												
	147信号与系统												L	L	M	H																										
	148工程材料与机械制造基础（双语）		L		M				M					M		M																										
	149流体力学与流体传动		L		H	L			L	M			L	M																												
	150控制工程基础		L			H			H	H					M																										
	151数字信号处理												H				M																								L	
	152机械设计		L			M						H	H		M																										

分类	课程名称	0 思想品德		1 工程知识					2 问题分析				3 设计/开发解决方案				4 研究				5 使用现代工具			6 工程与社会		7 环境和可持续发展		8 职业规范			9 个人和团队			10 沟通			11 项目管理			12 终身学习	
		0.1	0.2	1.1	1.2	1.3	1.4		2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	9.3	10.1	10.2	10.3	11.1	11.2	11.3	12.1	12.2
	153兵器测试技术					H			M						H	M			H	M	M																			
	154传感器与检测技术												H				M																						M	
	155武器系统与工程学科前沿讲座	M									M												H																H	H
实践必修	156军训																																							
实践必修	157入学教育	M	M																																					
实践必修	158大学物理实验I	L	L										L	M	H	M																								
实践必修	159大学物理实验II	L	L										L	M	H	M																								
实践必修	160武器系统与工程专业毕业设计										H				H							H			M									H	M	M		L			L
实践必修	161毕业教育		L																								L													
实践限选	162理科创新思维实训	L	L		M					L	L																				M	M								
实践限选	163电工电子实验								L					L				H			H																			
实践限选	164电装实习B	L	L										L								L								M											
实践限选	165工程训练-基础工程训练2	L	L										L								H								M											
实践限选	166工程训练-现代制造技术3	L	L										L								H								M											
实践限选	167专业基础实验I		L														H		H											M	H									
实践限选	168智能制造创新创业实训-小型机电系统操作与拆装	L	L																		H						M				M	M								
实践限选	169智能制造创新创业实训-移动机器	L	L																		H						M				M	M								

分类	课程名称	0 思想品德		1 工程知识				2 问题分析				3 设计/开发解决方案				4 研究				5 使用现代工具			6 工程与社会		7 环境和可持续发展		8 职业规范			9 个人和团队			10 沟通			11 项目管理			12 终身学习	
		0.1	0.2	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	9.3	10.1	10.2	10.3	11.1	11.2	11.3	12.1	12.2
	人避障与路径规划																																						
	170智能制造创新创业实训-智能制造产线基础实训	L	L																	H							M				M	M								
	171智能制造创新创业实训-工业机器人基本操作与虚拟仿真	L	L																	H							M				M	M								
	172工程训练-协同创作及制造技术	L	L									L								H								M												
	173专业基础实验II		L													H	M	H	H										L	L										
	174生产实习		M																					H	H	H		H		H						H				
	175专业基础实验III		L													H	M	H	H									M		L										
	176人工智能创新创业实训	L	L	H	H																		M	M													H			
实践选修	177机械原理课程设计		L								H				M																								
实践选修	178机械设计课程设计		L							M			M										M										M				L			
实践选修	179机电控制子系统综合设计实践			M																				M											L	L			
个性化发展 专业选修课	180人工智能技术及其军事应用			H	M							M																											
个性化发展 专业选修课	181自主智能系统环境感知技术				H	M		M		M																													
个性化发展 专业选修课	182智能化无人作战系统			H		M		M		M																													

分类	课程名称	0 思想品德		1 工程知识				2 问题分析				3 设计/开发解决方案				4 研究				5 使用现代工具			6 工程与社会		7 环境和可持续发展		8 职业规范			9 个人和团队			10 沟通			11 项目管理			12 终身学习	
		0.1	0.2	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	5.1	5.2	5.3	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	9.3	10.1	10.2	10.3	11.1	11.2	11.3	12.1	12.2
	183机器学习							H		H		H																												
	184机器人学基础							M								M	M																							
	185深度学习							M								M	M																							
	186图像处理与模式识别											M		H		M																								
	187Matlab仿真与优化		L																	H	M	H																	
	188Solidworks三维建模技术		L																	H	M																		
	189Ansys有限元分析		L						M											H	M	H																	
	190Altium电子设计自动化		L																	H	M	H																	
	自选课程																																						

十、培养方案对标情况表

X. Benchmarking Form

培养方案与《国标》对应情况

	国标要求	本方案	是否满足标准（是/否）
总学分	160	162	是
数学与自然科学类课程学分(比例)	15%	15.74%	是
人文社会科学类课程学分(比例)	15%	17.28%	是
学科基础和专业课程学分(比例)	30%	41.20%	是
实践教学环节学分比例	25%	29.2%	是
选修课程学分比例	无	9.4%	/
核心课程	武器系统概论、机械原理、机械设计、现代控制系统、传感与测试技术、信号与线性系统、无人武器系统。	武器系统与工程专业导论、机械设计、信号与系统、控制工程基础、机械原理、信号与系统、智能化无人作战系统。	是

注：（1）国标中未规定的项目填写无即可。（2）“核心课程”一栏逐项罗列国标规定课程和方案中与之对应的课程。

培养方案与工程教育认证通用标准对应情况

	工程教育认证通用标准要求	本方案	是否满足标准（是/否）
总学分	无	162	/
数学与自然科学类课程学分(比例)	15%	15.74%	是
人文社会科学类课程学分(比例)	15%	17.28%	是
学科基础和专业课程学分(比例)	30%	41.20%	是
实践教学环节学分比例	20%	29.2%	是
选修课程学分比例	无	9.4%	/
核心课程	无	武器系统与工程专业导论、机械设计、信号与系统、控制工程基础、机械原理、信号与系统、智能化无人作战系统。	/

注：（1）专业认证标准中未规定的项目填写无即可。（2）“核心课程”一栏逐项罗列规定课程和方案中与之对应的课程。

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校教学指导委员会主任	闫　莉