

电气工程及其自动化专业（专升本）培养方案

一、培养目标

本专业培养具有社会责任感，适应国家和区域经济发展要求，德智体美劳全面发展的社会主义接班人，能够在装备制造等领域从事电气控制相关的科学研究、工程设计、技术开发和项目管理等工作的高素质应用型工程技术人才。

毕业 5 年后的学生：

(1) 具有扎实的理论基础，具备适应装备制造等领域发展的专业能力和专业视野，能够综合运用数学、自然科学、专业知识以及交叉学科知识，对电气工程及相关领域复杂工程问题的解决方案进行分析和设计。

(2) 具有在企业与社会环境下，运用现代工具对装备制造业及相关领域的电气控制系统进行分析、设计、集成和服务的能力。

(3) 具有高度的社会责任感和道德修养、健全的人格、良好的心理素质和人文科学素养、和谐包容的团队精神、有效的沟通与表达能力和工程项目管理能力，在工程实践中能综合考虑法律、环境与可持续性发展等因素，具有坚持公众利益优先的素质。

(4) 具有广阔的国际视野，主动适应不断变化的国内外形势和环境，能够通过多种学习渠道更新知识，形成终生学习的习惯，实现能力和技术水平的提升。

二、专业方向

电气控制

三、毕业要求

本方案根据本科专业类教学质量国家标准、专业认证标准中的要求，基于成果导向教育理念，依据人才培养目标和专业多年形成的人才培养特色，针对电气工程领域及电气工程及其自动化专业的特点，制定本专业毕业能力要求和指标点分解。

毕业能力要求及其指标点分解：

毕业能力要求	指标点
毕业要求 1：工程知识：掌握数学、自然科学、工程基础和电气专业知识，能够运用其理论和方法解决装备制造业及相关工程领域电气控制系统的复杂工程问题。	1-1. 能够将数学、自然科学、工程基础和专业知识运用到复杂工程问题的恰当表述中。
	1-2. 能够将工程基础知识应用于电气控制单元的设计和分析。
	1-3. 能够将工程基础和专业知识用于装备制造业及相关工程领域电气控制系统判别和分析。
	1-4. 能够将工程基础和专业知识用于装备制造业及相关工程领域电气控制系统设计和改进。
毕业要求 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、并通过文献研究来分析装备制造业及相关工程领域电气控制系统的复杂工程问题，以获得有效结论。	2-1. 能够运用数学、自然科学和工程科学的基本原理，识别装备制造业及相关工程领域电气控制系统复杂工程问题中的关键环节。
	2-2. 能够通过系统集成分析、基于设备运行操作指标分析等方法正确表达装备制造业及相关工程领域电气控制系统的复杂工程问题。
	2-3. 能够通过文献研究来分析装备制造业及相关工程领域电气控制系统的复杂工程

	问题, 以获得有效结论。
毕业要求 3: 设计/开发解决方案: 在综合考虑社会、健康、安全、法律、文化以及环境等因素的前提下, 能够针对装备制造业及相关工程领域电气控制系统的复杂工程问题设计解决方案, 设计满足特定需求的系统、单元(部件), 并能够在设计环节中体现创新意识。	3-1. 能够在综合考虑社会、健康、安全、法律、文化以及环境等现实约束条件下, 对装备制造业及相关工程领域电气控制系统的复杂工程问题设计解决方案。 3-2. 能够根据用户的特定需求, 设计合理的电气控制系统、单元。 3-3. 能够通过集成单元过程对电气控制设计方案进行优化, 体现创新意识。
毕业要求 4: 研究: 能够基于科学原理并采用科学方法对装备制造业及相关工程领域电气控制系统的复杂工程问题进行研究, 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。	4-1. 能够基于专业理论, 根据对象特性, 选择研究路线。 4-2. 能够基于科学原理并采用科学方法对装备制造业及相关工程领域电气控制相关的复杂工程问题设计实验方案, 开展实验, 分析与解释数据。 4-3. 能够针对装备制造业及相关工程领域电气控制相关的复杂工程问题进行控制系统应用研究, 并通过信息综合得到合理有效的结论。
毕业要求 5: 使用现代工具: 掌握文献检索、资料查询以及运用现代信息技术获取相关信息的基本方法, 能够针对装备制造业及相关工程领域电气控制系统的复杂工程问题, 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。	5-1. 掌握文献检索、资料查询以及运用现代信息技术获取相关信息的基本方法。 5-2. 能够正确选择与使用仿真工具、人机界面集成工具等技术、资源, 对装备制造业及其相关的复杂工程问题进行预测与模拟。 5-3. 在解决电气控制相关的复杂工程问题实践中提高现代工具的应用能力, 并能够理解其局限性。
毕业要求 6: 工程与社会: 能够基于电气控制相关的背景知识进行合理分析, 评价专业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. 掌握社会、健康、安全、法律以及文化等方面的相关知识, 能够基于装备制造业及相关工程领域电气控制系统的背景知识进行合理分析。 6-2. 掌握社会主义核心价值观的内涵和意义, 在正确价值观的指导下, 能够评价工程实践和工程方案对社会、健康、安全、法律以及文化的影响, 理解在装备制造业及相关工程领域电气控制系统相关工程实践和复杂工程问题解决方案中应承担的责任。
毕业要求 7: 环境和可持续发展: 能够理解和评价针对装备制造业及相关工程领域电气控制系统的复杂工程问题的工程实践对环境、社会可持续发展的影响。	7-1. 能够理解和体验针对电气控制相关的复杂工程问题的工程实践对环境、社会可持续发展的影响。 7-2. 能够运用环境与可持续发展等相关法律法规分析、评价针对电气控制相关的复杂工程问题的工程实践对环境、社会可持续发展的影响。
毕业要求 8: 职业规范: 具有人文社会科学素养、社会责任感, 能够在装备制造业及相关工程领域电气控制系统的工程实践中理解并遵守工程职业道德和规范, 履行责任。	8-1. 具备科学的的世界观、人生观和价值观, 理解个人与社会的关系, 了解中国国情。 8-2. 能在工程实践中自觉遵守工程职业道德和规范, 诚实公正、诚信守则、爱岗敬业、珍爱生命。 8-3. 能够在工程实践中自觉履行对公众安全、健康、福祉和环境保护的社会责任。
毕业要求 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. 理解团队合作的意义, 能够在工程项目的研发和实施过程中, 与不同学科领域人员进行有效沟通, 合作共事。 9-2. 具有良好的大局观念, 能够在团队中根据需要独立或合作开展工作。 9-3. 能够在多学科交叉背景下, 组织、协调和带领团队开展工作。
毕业要求 10: 沟通: 能够就装备制造业及相关工程领域电气控制系统的复杂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. 能够运用语言工具准确表达自己的观点, 能与业界同行和公众进行有效沟通和交流。 10-2. 了解装备制造业及相关工程专业领域国际发展趋势和热点问题。 10-3. 理解并尊重文化差异, 能够就电气控制相关的复杂工程问题, 在跨文化背景下进行基本的沟通和交流。
毕业要求 11:	11-1. 理解并掌握一定的工程管理原理与经济决策方法。

项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。	11-2. 能够应用工程管理原理与经济决策方法对电气控制相关的复杂工程问题进行有效分析和综合评价。
毕业要求 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. 能在社会发展的大背景下，认识到不断探索和学习的必要性，具有自主学习和终身学习的意识。
	12-2. 具有自主学习能力，包括对问题的理解能力，归纳能力和提出问题能力等；掌握终身学习的语言工具和计算机工具，身心健康，以适应工作中的各种任务。

专业毕业要求应该能够支撑培养目标的达成。建立本专业毕业要求支撑培养目标实现的关系矩阵。

毕业要求支撑培养目标实现的关系矩阵

毕业要求	培养目标			
	培养目标 1	培养目标 2	培养目标 3	培养目标 4
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				√

四、主干学科

电气工程

五、专业核心课程

电路分析基础、模拟电子技术、数字电子技术、电机及拖动基础、自动控制原理、电力系统分析基础、电力电子技术、电气控制技术、运动控制系统。

六、修业年限

本科基本学制 2 年，按照学分管理制度管理。

七、授予学位

学生应至少修满 91.0 学分方可毕业。符合《沈阳化工大学本科毕业生学士学位授予工作有关规定(2017 年 3 月修订)》学位授予条件者，可授予工学学士学位。

八、学分要求

课程类别	课程模块		课程性质	学分要求	小计	比例(%)
通识教育课	通识教育必修课	思政类	必修	10	23.5	25.82
		外语类		6		
		计算机类		2.5		
		军事安全类		2		
		劳动教育类		1		
		创新创业类		1		
		心理健康类		1		
	通识教育选修课	美育类(400)	选修	1	5	5.49
		中国与世界(500)		1-3		
		四史(600)		1		
		经济管理类(700)		1		
		传统文化(900)		1		
	通识教育实践课	军训	实践	2	2	2.00
学科平台课	学科基础课程	公共基础类	必修	26.5	27.0	29.67
		专业基础类				
	学科实践课程	-	实践	0.5		
专业教育课	专业核心课程	-	必修	10.5	33.5	36.81
	专业选修课程	-	选修	2		
	专业实践课程	-	实践	21		
课外环节	课外通识实践	人文社会实践	课外实践	4		
		身心健康实践				
		外语技能实践				
	创新创业实践	创新训练		4		
		创新大赛				
		创客活动				
	生涯教育	成长规划类		1		
总学分/比例					91.0	100

Electrical Engineering and Automation Major 2021 Undergraduate Education Program

I. Educational Objectives

1. Educational Objectives

This major cultivates high-quality application-oriented engineering and technical personnel who have a sense of social responsibility, adapt to the requirements of national and regional economic development, develop morally, intellectually, physically, aesthetically and laboriously, and can engage in scientific research, engineering design, technical development and project management related to electrical control in the field of equipment manufacturing.

Graduates should obtain knowledge and competence as follows:

(1) With solid theoretical foundation, professional ability and vision to adapt to the development of equipment manufacturing and other fields, they are able to use mathematics, natural science, professional knowledge and interdisciplinary knowledge to analyze and design solutions to complex engineering problems in electrical engineering and related fields.

(2) Be able to analyze, design, integrate and serve systems with the enterprise and social environment, the use of modern tools for equipment manufacturing and related fields of electrical control

(3) In engineering practice, they can comprehensively consider the factors of law, environment and sustainable development, and have the quality of adhering to the priority of public interest. with a high sense of social responsibility and moral cultivation, sound personality, good psychological quality and humanity.

(4) With a broad international perspective, they can actively adapt to the changing domestic and international situations and environment, can update knowledge through a variety of learning channels, form lifelong learning habits, and achieve the improvement of ability and technical level.

II. Major direction

Electrical control

III. Graduation Requirements

According to the requirements of the national standards of undergraduate professional teaching quality and professional certification standards, based on the concept of achievement oriented education, according to the talent training objectives and professional training characteristics formed over the years, and in view of the characteristics of the field of electrical engineering and electrical engineering and automation specialty, the graduation ability requirements and index points of this specialty are formulated.

Graduates should obtain knowledge and competences as follows:

Graduation Requirements	Indices
Requirement 1: Engineering knowledge: Master	1-1. Be able to apply mathematics, natural science, engineering foundation and professional knowledge to the proper expression of complex engineering problems.

<p>mathematics, natural science, engineering foundation and electrical professional knowledge, and be able to use their theories and methods to solve complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields.</p>	1-2. Be able to apply basic engineering knowledge to the design and analysis of electrical control unit.
	1-3. Be able to apply engineering foundation and professional knowledge to the identification and analysis of electrical control system in equipment manufacturing industry and related engineering fields.
	1-4. Be able to apply basic and professional engineering professional knowledge to designing and improving electrical control system in equipment manufacturing industry and related engineering fields.
<p>Requirement 2: Problem analysis: Be able to apply the basic principles of mathematics, natural science and engineering science to identify, express and analyze the complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields through literature research, so as to obtain effective conclusions.</p>	2-1. Be able to use the basic principles of mathematics, natural science and engineering science to identify the key links in complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields.
	2-2. Be able to express the complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields through system integration analysis and equipment operation index analysis.
	2-3. Through literature research, they can analyze the complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields and obtain effective conclusions.
<p>Requirement 3: Design / development solutions: under the premise of comprehensive consideration of social, health, safety, legal, cultural and environmental factors, we can design solutions for complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields, design systems, units (components) to meet specific needs, and embody the sense of innovation in the design process.</p>	3-1. Be able to design solutions to complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields under the realistic constraints of society, health, safety, law, culture and environment.
	3-2. Be able to design reasonable electrical control system and unit according to the specific needs of users.
	3-3. Be able to optimize the electrical control design scheme through the integrated unit process, reflecting the innovation consciousness.
<p>Requirement 4: Research: Based on scientific principles and using scientific methods, students can study complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.</p>	4-1. Be able to choose research route based on professional theory and object characteristics.
	4-2. Be able to design experimental schemes, they carry out experiments, analyze and interpret data for complex engineering problems related to electrical control in equipment manufacturing industry and related engineering fields based on scientific principles and scientific methods.
	4-3. Be able to carry out control system application research on complex engineering problems related to electrical control in equipment manufacturing industry and related engineering fields, and obtain reasonable and effective conclusions through information synthesis.

<p>Requirement 5:</p> <p>Using modern tools: master the basic methods of literature retrieval, data query and use modern information technology to obtain relevant information, and be able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools, including the understanding of complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields and prediction and simulation, and be able to understand its limitations.</p>	<p>5-1. Master the basic methods of literature retrieval, data inquiry and the use of modern information technology to obtain relevant information.</p>
	<p>5-2. Be able to select and use simulation tools, human-computer interface integration tools and other technologies and resources to predict and simulate the equipment manufacturing industry and its related complex engineering problems.</p>
	<p>5-3. In the practice of solving complex engineering problems related to electrical control, they can improve the application ability of modern tools, and be able to understand their limitations.</p>
<p>Requirement 6:</p> <p>Engineering and society: be able to conduct reasonable analysis based on the background knowledge related to electrical control, evaluate the impact of professional engineering practice and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities.</p>	<p>6-1. Master the relevant knowledge of society, health, safety, law and culture, and be able to make reasonable analysis based on the background knowledge of electrical control system in equipment manufacturing industry and related engineering fields.</p>
	<p>6-2. Grasp the connotation and significance of socialist core values, and under the guidance of correct values, be able to evaluate the impact of engineering practice and engineering scheme on society, health, safety, law and culture, and understand the responsibilities to be undertaken in the engineering practice related to electrical control system and solutions to complex engineering problems in equipment manufacturing industry and related engineering fields.</p>
<p>Requirement 7:</p> <p>Environment and sustainable development: Be able to understand and evaluate the impact of engineering practice aiming at complex engineering problems of electrical control system in equipment manufacturing industry and related engineering fields on environment and social sustainable development</p>	<p>7-1. Be able to understand and experience the impact of engineering practice for complex engineering problems related to electrical control on environmental and social sustainable development.</p>
	<p>7-2. Be able to use environmental and sustainable development laws and regulations to analyze and evaluate the impact of engineering practice for complex engineering problems related to electrical control on environmental and social sustainable development.</p>
<p>Requirement 8:</p> <p>Professional norms:</p> <p>Have the quality of Humanities and Social Sciences, sense of social responsibility, be able to understand and abide by the engineering professional ethics and norms in the engineering practice of electrical control system in equipment manufacturing industry and related engineering fields, and fulfill the responsibilities.</p>	<p>8-1 Have a scientific world outlook, outlook on life and values, understand the relationship between individual and society, and understand China's national conditions.</p>
	<p>8-2. Be able to consciously abide by engineering professional ethics and norms in engineering practice, be honest and fair, code of integrity, love their posts and respect their lives.</p>
	<p>8-3. Be able to consciously fulfill the social responsibility for public safety, health, well-being and environmental protection in engineering practice.</p>

<p>Requirement 9: Individual and team: Be able to play the role of individual, team member and leader in a multidisciplinary team.</p>	9-1. Understand the significance of teamwork, and be able to effectively communicate and cooperate with personnel in different disciplines in the R & D and implementation of engineering projects.
	9-2. Have a good overall concept and be able to work independently or cooperatively in the team as required.
	9-3. Be able to organize, coordinate and lead the team to carry out work in the interdisciplinary context.
<p>Requirement 10: Communication: Be able to communicate and communicate with industry peers and the public on complex engineering problems of electrical control system in equipment manufacturing and related engineering fields, including writing reports and design documents and statement statements, clearly expressing or responding to instructions, and having a certain international vision, and being able to communicate in cross-cultural background.</p>	10-1. Be able to use language tools to accurately express their views and effectively communicate with peers in the industry and the public.
	10-2. Be able to understand international development trends and hot issues in equipment manufacturing industry and related engineering fields.
	10-3. Be able to understand and respect cultural differences, and be able to conduct basic communication and exchange on complex engineering issues related to electrical control in a cross-cultural context.
<p>Requirement 11: Project management: Understand and master the principles of engineering management and economic decision-making methods, and be able to apply them in a multidisciplinary environment.</p>	11-1. Understand and master certain engineering management principles and economic decision methods.
	11-2. Be able to effectively analyze and comprehensively evaluate complex engineering problems related to electrical control by applying engineering management principles and economic decision-making methods.
<p>Requirement 12: Lifelong learning: Have the consciousness of self-learning and lifelong learning, have the ability of continuous learning and adapting to development.</p>	12-1. Be able to recognize the necessity of continuous exploration and learning under the background of social development, and have the awareness of autonomous learning and lifelong learning.
	12-2. Have the ability of independent learning, including the ability to understand, summarize and ask questions; Master the language tools and computer tools of lifelong learning, and be physically and mentally healthy to adapt to various tasks at work.

The relationship between graduation requirements and educational objectives

Graduation Requirements	Educational Objectives			
	Educational Objectives 1	Educational Objectives 2	Educational Objectives 3	Educational Objectives 4
1: Engineering Knowledge	√			
2: Problem Analysis	√			
3: Design/Development Solutions	√			

4: Research		√		
5: Use Modern Tools		√		
6: Engineering and Society		√		
7: Environment and Sustainable Development			√	
8: Career Planning			√	
9: Individuals and Teams			√	
10: Communicate			√	√
11: Project Management			√	
12: Lifelong Learning				√

IV. Major Subject

Electrical engineering

V. Core Courses

Fundamentals of Circuit Analysis, Analog Electronic Technology, Digital Electronic Technology, Fundamentals of Electric Machinery and Drive, Automatic Control Theory, Fundamentals of Power System Analysis, Power Electronics, Technology of Electric Control, Motion Control System.

VI. Educational System

The basic length of undergraduate education is 2 years, which is managed according to the credit system.

VII. Confer Degrees

Students are required to complete at least *91.0* credits before graduation. The Bachelor of Engineering degree can be granted to those who meet the requirements of the Relevant Provisions on the Awarding of Bachelor's Degree for Graduates of Shenyang University of Chemical Technology (revised in March 2017).

VIII. Credit Requirements

Course Type	Course Modules		Course Nature	Credit requirement	Subtotal	Proportion (%)
General Education	General Education (Compulsory)	Ideological and Political Courses	Compulsory	10	23.5	25.82
		Foreign Language Courses		6		
		Computer Courses		2.5		
		Military and Safety Courses		2		
		Labor and Sport Education		1		
		Innovation and Entrepreneurship		1		
		Mental Health		1		
	General Education (Optional)	Aesthetic Education(400)	Optional	1	5	5.49
		China and the World(500)		1-3		
		Four Histories(600)		1		
		Economic Management(700)		1		
	Traditional Culture(900)		1			
General Education (Practice)	Military Training	Practice	2	2	2.00	
Discipline Education	Basic Courses	Public Basic Class	Compulsory	26.5	27.0	29.67
		Professional Foundation				
	Basic Practice Sessions	-	Practice	0.5		
Specialized Education	Core Courses	-	Compulsory	10.5	33.5	36.81
	Optional Courses	-	Optional	2		
	Specialized Practice Sessions	-	Practice	21		
Extracurricular links	Extracurricular General Education Practice	Culture and Society Practice	Extracurricular Practice	4		
		Mentally and Physically Practice				
		Foreign Language Proficiency Training Practice				
	Extracurricular Characteristic Practice	Innovative Training		4		
		Innovation Competition				
		Chuangke Activities				
Career Education	Growth Planning Courses		1			
Total/Proportion					91.0	100

九、电气工程及其自动化专业教学进程表

Table of Teaching Schedule for Electrical Engineering and Automation Major

课程类别 Course Type	课程性质 Course Nature		课程号 Course Code	课程名称 Course Name	学分 Cre.	总学时数 T.C.H	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester				备注 Notes		
							讲课 Lec.	实验 Exp.	上机 Pro.	课外实践 Pra.	一 1st	二 2nd	三 3rd	四 4th			
通识教育课 General Education	必修 Compulsory	思政类 Ideological and Political Courses	0710053003	中国近现代史纲要 Outline of Chinese Contemporary and Modern History	3.0	48	32			16	2						
			0710103003	马克思主义基本原理* Basic Principles of Marxism*	3.0	48	32			16		2					
			0710123001	习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	3.0	48	40			8				3			
			0710011303	形势与政策 Current Situation and Policies	1.0	32	32					1	1	1	1		
		外语类 Foreign Language Courses	0211003103	大学外语I College English I	3.0	48	48					3					
			0211003203	大学外语II College English II	3.0	48	48						3				
		计算机类 Computer Courses	1541372004	C 语言程序设计 C Programming Language	2.5	44	32		12			2					
		军事安全类 Military and Safety Courses	0710081003	军事理论 Military Theory	1.0	16	16					2					
			1510261303	安全教育 Safety Education	1.0	16	16						2				

课程类别 Course Type	课程性质 Course Nature		课程号 Course Code	课程名称 Course Name	学分 Cre.	总学时数 T.C.H	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester				备注 Notes		
							讲课 Lec.	实验 Exp.	上机 Pro.	课外实践 Pra.	一 1st	二 2nd	三 3rd	四 4th			
通识教育课 General Education	必修 Compulsory	劳动教育类 Labor Education	2640021003	劳动教育 Labour Education	1.0	16	16					2					
		创新创业类 Innovation and Entrepreneurship courses	1557011003	创造性思维与创新方法 Creative Thinking and Innovative Methods	1.0	16	16						2				
		心理健康类 Mental Health Courses	0510041003	大学生心理与健康教育 Mental and Health Education for College Students	1.0	16	16				2						
		小计 Subtotal			23.5	396	344	0	12	40	10.5	8	4	1	23.5		
	选修 Optional		分为经济管理类（1.0）、美育类（1.0）、四史（1.0）、传统文化（1.0）、中国与世界（1.0）课程类5个模块 每个模块最多选修2.0学分，每学期最多选修2门课程。 Including 6 modules: Economic Management, Aesthetic Education, Science and Technology, Four Histories, Traditional Chinese Culture, China and The world. Up to 2.0 credits per module and up to 2 courses per semester.														
	小计 Subtotal			5.0													
	实践 Practice		0415102013	军训 Military Training	2.0	48				48	2					必选	
合计 Total					30.5	444	344	0	12	88	12.5	8	4	6	30.5		
学科平台课 Discipline Education	必修 Compulsory	数学与自然科学类 Natural Science & Mathematics	0310002103	高等数学 I* Advanced Mathematics I*	2.0	32	32				2						
			0310002203	高等数学 II* Advanced Mathematics II*	2.0	32	32					2					
			0310032003	线性代数 Linear Algebra	2.0	32	32					3					
			0310042003	概率论与数理统计 Probability and Statistics	2.0	32	32						2				

课程类别 Course Type	课程性质 Course Nature		课程号 Course Code	课程名称 Course Name	学分 Cre.	总学时数 T.C.H	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester				备注 Notes
							讲课 Lec.	实验 Exp.	上机 Pro.	课外实践 Pra.	一 1st	二 2nd	三 3rd	四 4th	
学科平台课 Discipline Education	必修 Compulsory	工程基础类 Foundation Engineering	1540163004	电路分析基础* Fundamentals of Circuit Analysis*	3.0	48	48				3				
			1540913004	模拟电子技术* Analogue Electronic Technology*	3.0	52	40	12			3				
			1540923004	数字电子技术* Digital Electronic Technology*	3.0	52	40	12				3			
		专业基础类 Subject Foundation Requisite	1511024004	自动控制原理* The Principle of Automatic Control*	4.0	68	56	8	4			4			
			1512102004	电力电子技术* Power Electronics *	2.5	44	32	12				2			
			1512852004	电机及拖动基础 Fundamentals of Electric Machinery and Drive	3.0	50	44	6				3			
			小计 Subtotal		26.5	442	388	50	4	0	10	16.5	0	0	
	实践 Practice	1540150014	电路分析基础实验 Circuit Analysis Experiment	0.5	12		12				+2				
		小计 Subtotal		0.5						0.5					
	合计 Total					27.0	454	388	62	4	0	10.5	16.5	0	0
	专业教育课 Specialized Education	必修 Compulsory	1522352004	电气控制技术* Electrical Control Technology*	2.5	42	36	6					3		
1522362004			可编程控制器原理与应用 The Principle and Application of Programmable Controller	2.5	44	32	12					4			
1522372004			运动控制系统* Motion Control System*	2.5	44	32	12					3			
1522413004			电力系统分析基础 Fundamentals of Electric Power System	3.0	50	44	6				4				

课程类别 Course Type	课程性质 Course Nature	课程号 Course Code	课程名称 Course Name	学分 Cre.	总学时数 T.C.H	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester				备注 Notes	
						讲课 Lec.	实验 Exp.	上机 Pro.	课外 实践 Pra.	一 1st	二 2nd	三 3rd	四 4th		
专业教育课 Specialized Education		小计 Subtotal		10.5	180	144	36	0	0	0	3	7.5	0		
	选修 Optional	1547042004	计算机网络与通信技术 Computer Network and Communication Technology	2.0	32	32						2			
		1544302004	信号与系统II Signals and Systems II	2.0	34	28	6			3					
		1536252004	VB 程序设计 Visual Basic Program Design	2.0	36	24					2				
		1531383004	现代控制理论 Modern Control Theory	3.0	52	40	8	4					3		
		1543112004	单片机应用基础 MCU Application Basis	2.0	34	28	6				2				
		小计 Subtotal		2.0											
	(此处填写修读要求 Fill in the Study Requirements)														
	实践 Practice	1512242024	电机调速系统设计 Design of Motor Speed control System	2.0	48		48						+2		
		1512292024	电气控制技术设计 Design of electrical control technology	3.0	72		72						√		
		1512272024	PLC 系统实训 PLC System Training	2.0	48		48						+2		
		1512224044	毕业设计(论文) Graduation Design (Thesis)	14	336		336								+14
		小计 Subtotal		21.0	504	0	504	0	0	0	0	0	7	14	
	合计 Total				33.5	684	144	540	0	0	0	3	16.5	14	33.5
	总计 Sum				91.0	1582	876	602	16	88	23	27.5	20.5	20	91.0

课程类别 Course Type	课程性质 Course Nature		课程号 Course Code	课程名称 Course Name	学分 Cre.	总学时数 T.C.H	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester				备注 Notes
							讲课 Lec.	实验 Exp.	上机 Pro.	课外实践 Pra.	一 1st	二 2nd	三 3rd	四 4th	
课外环节 Extracurricular links	课外实践 Extracurricular practice	人文社会实践 Culture and Society Practice	1513401033	社会调查 Social Survey	0.5	12				12					分散
		身心健康社会实践 Mentally and Physically Practice	0410050751	课外体育锻炼 Extracurricular Physical Exercise	0.5	12				12					分散
			2640030013	劳动教育实践 Labour Education Practice	0.5	12				12	0.5				分散
			0510070311	心理健康辅导 Mental Health Counseling	0.5	12				12					分散
课外环节 Extracurricular links	课外实践 Extracurricular practice	外语技能实践类 Foreign Language Proficiency Training Practice	0210010013	外语技能实践（初级） Foreign Language Proficiency Training Practice（Elementary）	2.0	48				48				2	(2选1) 分散
			0210020013	外语技能实践（高级） Foreign Language Proficiency Training Practice（Advanced）	2.0	48				48				2	
		能力与创新实践 Capability and Innovation Practice	1541712024	大学生素质拓展与创新实践 Quality Development and Innovation Practice	4.0	96				96	1~4 学期依据《沈阳化工大学创新创业实践学分认定办法》由创新创业学院认定				分散
	成长规划类 Growth Planning Courses	1540271314	职业规划与就业指导 Career Planning and Employment Guidance	1.0	40	40				1					分散
小计 Subtotal															

理论课 1 学分 16 学时，实验课程、上机等 1 学分 24 学时，体育课 1 学分 36 学时，集中实践环节 1 个教学周计 1 学分，学分最小单位为 0.5，课程名称中画*为考试课。

十、电气工程及其自动化专业学士学位课程一览表

A list of bachelor's degree programs in Electrical Engineering and Automation

课程类别 Course Type	模块名称 Modules	序号 No.	课程编号 Course Codes	课程名称 Course Name	学分 Credits	开课学期 Semester
通识教育课 General Education	政治理论 Political Theory	1	0710103003	马克思主义基本原理* Elementary Theory of Marxism*	3.0	2
学科平台课 Discipline Education	数学 Mathematics	2	0310002103	高等数学I* Advanced Mathematics I*	2.0	1
	工程基础 Foundations of Engineering	3	1540163004	电路分析基础* Fundamentals of Circuit Analysis*	3.0	1
		4	1540923004	数字电子技术* Digital Electronic Technology*	3.0	2
	专业基础 Subject Foundation Requisite	5	1511024004	自动控制原理* The Principle of Automatic Control*	4.0	2
		6	1512102004	电力电子技术* Power Electronics*	2.5	2
专业教育课 Specialized Education	电气控制 Electrical Control	7	1522352004	电气控制技术* Technology Electrical Control Technology*	2.5	3
		8	1522372004	运动控制系统* Motion Control System*	2.5	3

说明：关于学士学位课的具体要求见《沈阳化工大学关于学士学位课程水平审核制度的若干规定》

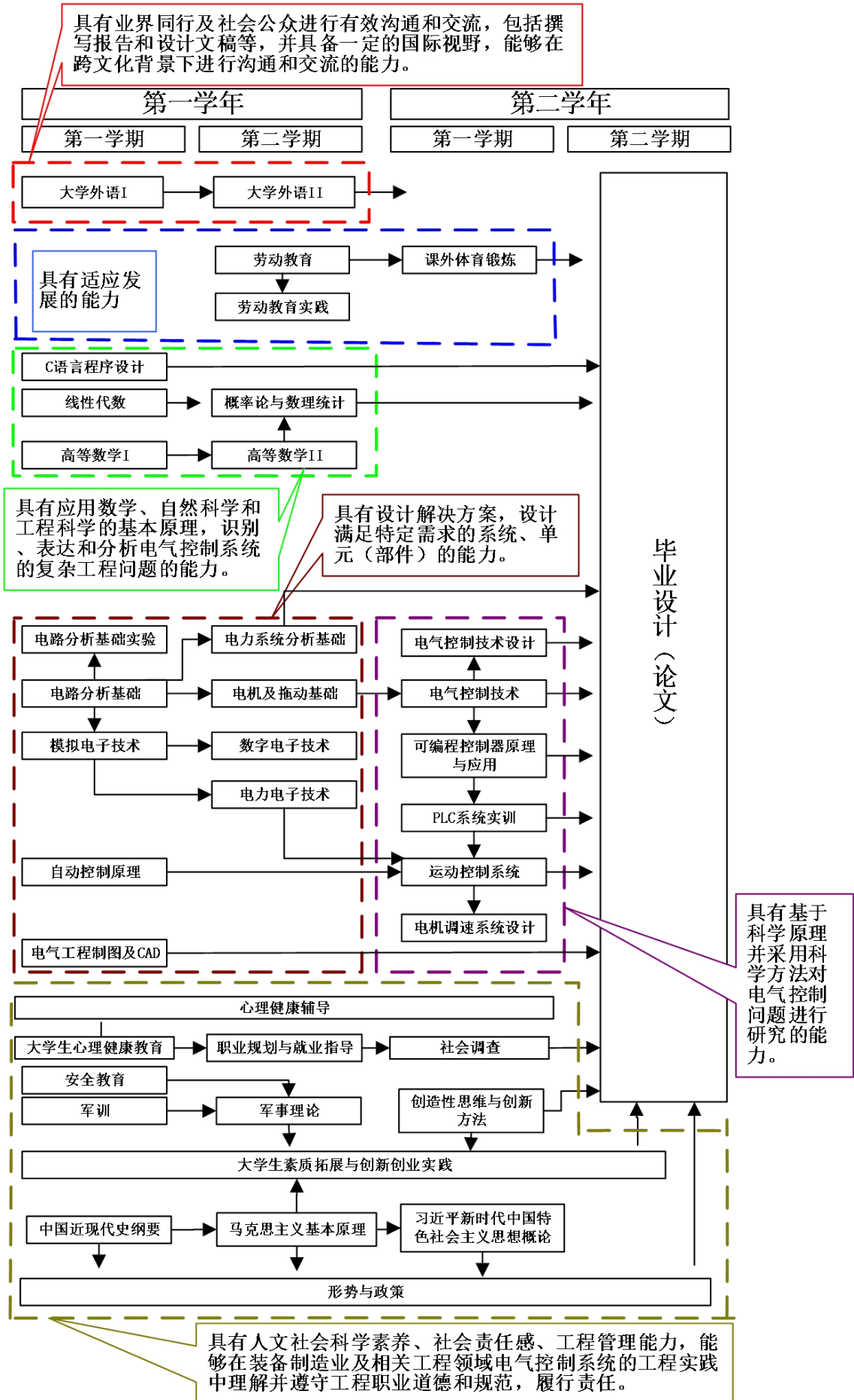
十一、全学程实践环节周历安排 Weekly Calendar of all Practice Sessions

学期	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	备注
一		☆	☆															::	::	.		
二																		::	::	.		
三	△	△	△	△			△	△										::	::	.		
四	=	=	=	=	=	=	=	=	=	=	=	=	=	=								

符号说明(Symbol Description):

※金工实习||Metalworking Practice △课程设计||Curriculum Design /生产实习||Specialized Production Practice L 专业实验||Specialty Experiment P 各类实训、学年论文||Practical Training、Term Paper :: 考试||Examination ▼ 认识实习||Cognition Practice ☆军训||Military Training = 毕业设计(论文)||Graduation Project(Thesis) ·小学期||Primary Term

十二、课程体系配置图 Curriculum System Configuration Diagram



十三、主要课程与毕业能力要求关系矩阵图(相关性强 H,相关性中 M, 相关性弱 L)

Correlation Matrix between Key Courses and Graduation Requirements (High Correlation—H, Medium Correlation—M, Low Correlation—L)

课程 (Courses)	毕业能力要求 (Graduation Requirements)																																		
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	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	12.1	12.2		
中国近现代史纲要 Outline of Chinese Contemporary and Modern History																						M													
马克思主义基本原理* Basic Principles of Marxism*																						M													
习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era																						M													
形势与政策 Current Situation and Policies																						M							M	M					
大学外语 College English																												M		M					M
C 语言程序设计 C Language Programming																																			M
军事理论 Military Theory																						M													

课程 (Courses)	毕业能力要求 (Graduation Requirements)																																		
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	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	12.1	12.2		
安全教育 Safety Education							M										M														L	L			
劳动教育 Labour Education																						L		M		M									
创造性思维与创新方法 Creative Thinking and Innovative Methods																												L				L	H		
大学生心理与健康教育 Mental and Health Education for College Students																	M					L												L	
军训 military training																						M	M			H									
高等数学* Advanced Mathematics*	M	M	M	L																															
线性代数 Linear Algebra	M	M	M	L																															
概率论与数理统计 Probability and Statistics	M				L																														
电路分析基础* Fundamentals of Circuit Analysis*	M					H																													
模拟电子技术* Analog Electronic Technology*		M	L			M																													
数字电子技术*		M				M			L																										

课程 (Courses)	毕业能力要求 (Graduation Requirements)																																			
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	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	12.1	12.2			
Digital Electronic Technology*																																				
自动控制原理* The Principle of Automatic Control*				L	M																															
电力电子技术* Power Electronics*		H								M					M																					
电机及拖动基础 Fundamentals of Electric Machinery and Drive		L									M																									
电路分析基础实验 Circuit Analysis Experiment		M			L	L																			M											
电气控制技术* Technology Electrical Control Technology*			H	M															M							M										
可编程控制器原理与应用 The Principle and Application of Programmable Controller				M					M							L																				
运动控制系统* Motion Control System*			L	H							M		L																							
电力系统分析基础 Fundamentals of Electric Power System					M																												M			
电机调速系统设计 Design of Motor Speed Control System								M					M	M												M										
电气控制技术设计 Design of Electrical Control Technology							L					L						M		L														L		

课程 (Courses)	毕业能力要求 (Graduation Requirements)																																	
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	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	12.1	12.2	
PLC 系统实训 PLC System Training										L		M				L																	M	
毕业设计 (论文) Graduation Design (Thesis)							H	M					M			H				M								M	M			M		M