信息工程学院

信息工程学院简介

信息工程学院是西南科技大学本科办学历史最悠久的学院之一。始建于 1952 年，1974 年招收第一届电气自动化专业中专生，1978 年招收第一届电气自动化专业本科生，2005 年更名为信息工程学院。学院所有专业均为重点批次招生的专业，其中自动化为省级和国家级特色专业，电子信息工程为国防特色专业，自动化（卓越计划）专业为国家级卓越计划专业。

学院现有控制科学与工程一级学科博士学位授权点，信息与通信工程、控制科学与工程 2 个一级学科硕士学位授权点，电路与系统二级学科授权点，电子与通信工程、集成电路工程、控制工程 3 个专业学位授权领域，2 个省级重点学科，1 个省重点实验室和 2 个省高校重点实验室。6 个本科专业中，有 1 个国家特色专业，1 个国防重点专业，1 个省级人才培养基地。

学院拥有 130 余位教师组成的教学科研队伍，有 20 多位教授、30 多位副教授。其中国家杰出青年科学基金获得者 1 人，四川省学术和技术带头人 3 人，四川省突出贡献的优秀专家 3 人。并拥有来自中国工程物理研究院、中国空气动力研究与发展中心、四川长虹电子集团公司、四川九洲集团公司、西南自动化研究所等联合办学董事单位的 20 余位正副研究员、高级工程师组成的兼职教学科研队伍。

学院拥有专业实验室面积 9000m^2，设备总值 2200 万元。在区域产学研合作办学体制支撑下，学院与董事单位联合开展科学研究，在工业现场控制、机器人技术、微机电系统、新一代互联网、软件无线电及信道认知、光电信息检测、物联网等方面形成特色，先后主持完成多项“国家 863 计划”、“国家自然科学基金”和省部级重点攻关等科研项目，获国家、省部级奖励多项。目前学院主持在研的“国家自然基金”、国家“863 计划”项目 7 项，横向项目 50 余项，近三年到校科研经费 2000 余万元。

学院现有硕士研究生和本科生 3400 余人，学院特别注重培养学生的科研和实践创新能力培养，广泛组织学生参加全国各种科技创新竞赛。我院学生曾在 2003 年全国大学生机器人电视大赛中荣获冠军、并代表中国参加亚太地区大学生机器人大赛荣获亚军；2014 年获得全国大学生“创青春”创业大赛全国金奖（四川省高校唯一的全国金奖）。自 1994 年全国大学生电子设计竞赛开始，我院共计荣获 100 多项全国和四川省奖项，成绩位于四川省高校第三，另外我院学生每年还要在“挑战杯”课外科技活动竞赛、全国大学生 ACM 程序设计竞赛、“西门子”杯工业自动化挑战赛、“飞思卡尔”全国大学生智能车大赛、全国大学生物联网创新大赛等科技竞赛中取得多项国家级奖项和省级奖项。

三十多年来学院已为国家培养了近 8000 名控制、通信、电子、生医类本科、硕士毕业生，他们很多已经成为国内外企业骨干、大学教授、设计研究院院长和全国劳模等，在沿海以及西部地区企业的科研、管理和生产等领域发挥了重要的作用。近年来，学院本科毕业生的一次性就业率一直保持在 90%以上，毕业生深受广大用人单位的好评。

信息工程学院本科专业设置一览表

No.	专业名称	基本学制	总学分	授予学位	开始招生年份
1	自动化	四年	170	工学学士	1978 年
2	电子信息工程	四年	170	工学学士	1997 年
3	生物医学工程	四年	170	工学学士	2001 年
4	通信工程	四年	173	工学学士	2001 年
5	电气工程及其自动化	四年	170	工学学士	2009 年
6	物联网工程	四年	173	工学学士	2011 年

电子信息工程专业培养方案

Undergraduate Program for Specialty in Electronic and Information Engineering

专业负责人：李少甫　主管院长：姚远程　院学术委员会主任：邹传云

Director of Specialty:Shaofu LI
Executive Dean: Yuancheng Yao
Academic Committee Director: Chuanyun Zou

一、修业年限及授予学位名称

学制 4 年，最低毕业学分 170，允许学习年限为 3-6 年。授予工学学士学位。

Ⅰ.Length of Schooling and Degree:

Length of schooling: 4 years. The minimum graduation credits are 170, allowing the study period of 3-6 years.

Degrees Conferred: Bachelor of Engineering.

二、培养目标

本专业培养能够综合运用高等数学等数学知识、大学物理等自然科学、本学科工程科学的基础理论与专业知识，分析和解决电子信息工程专业领域的复杂工程问题，具备在电子信息或相关工程领域进行技术开发、系统集成、设备运行维护、工程项目的实施管理等方面的工作能力，能在团队中进行有效交流与合作，具有较高的思想政治素质、社会责任感、职业道德、创新意识和善于学习的应用型高层次人才。

毕业 5 年左右的预期目标：

（1）道德修养：具有较高的思想政治素质、职业道德、社会责任感，能够在工程实践中遵守职业规范，履行责任；

（2）问题解决：能够综合运用高等数学等数学知识、大学物理等自然科学、本学科工程科学的基础理论与专业知识，分析和解决射频与微波系统设计或者数字媒体技术与传输等电子信息工程领域的复杂工程问题；

（3）协作能力：具有良好的团队协作能力和一定的领导能力，能够有效地进行交流合作，具备一定的国际视野；

（4）学习能力：具有自主学习和终身学习的意识，能够不断学习，实现工作能力的自我提升；

（5）社会服务：适应社会竞争与合作，愿意且能够为地方经济、国家建设服务，能够从事电子信息工程或相关工程领域的技术开发、系统集成、设备运行维护、工程项目的实施管理等工作。

Ⅱ. Educational Objectives

The specialty aimed at bringing up the "High Level Applied Engineering " senior engineering and technical personnel, who can comprehensively apply the knowledge of mathematics, natural science and engineering science, to analyze and solve complex engineering problems in the field of electronic information engineering, has the ability to carry out technology development, system integration, equipment operation and maintenance, implementation and management of engineering projects in the field of electronic information or related engineering, hold a high ideological and political quality, social responsibility, professional ethics, innovative consciousness, and good at learning .

The expected goal of 5 years :

(1) Moral Cultivation: with high ideological and political quality, professional ethics and social responsibility, abiding by professional norms and fulfill responsibilities in engineering practice.

(2) Solve the problem: comprehensive use of basic theories and professional knowledge of mathematics, natural science, the discipline of Engineering Science to analyze and solve complex engineering problems in the field of electronic information engineering, such as RF and microwave system design or digital media technology and transmission etc.

(3) Cooperation ability: has good team cooperation ability and certain leadership ability, can effectively carry on communication and cooperation, have a certain international vision;

(4) Learning ability: the consciousness of self-study and lifelong learning, continuous learning and self promotion of working ability;

(5) Social services: to adapt to social competition and cooperation, willing and able to serve local economic and national development, and be able to engage in technology development, system integration, equipment operation and maintenance, and implementation and management of engineering projects in electronic information engineering or related engineering fields.

三、培养规格及要求

毕业生应获得以下几方面的知识和能力：

1．工程知识：能够将高等数学等数学知识、物理等自然科学、计算机等基础理论知识、电子线路与系统、信号与信息处理、电磁波和微波技术、数字媒体技术基础等工程科学专业知识，用于解决信息获取、传输和处理等电子信息工程领域的复杂工程问题。

2．问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析电子信息工程领域的复杂工程问题，以获得有效结论。

3．设计/开发解决方案：针对电子信息工程领域中的复杂工程问题，能够给出合理的解决方案，设计满足特定需求的功能模块或系统，并能够在设计方案中体现创新意识，同时能够考虑上述解决方案对社会、健康、安全、法律、文化、环境等的影响。

4．研究：能够基于科学原理，采用科学方法对电子信息工程领域中的复杂工程问题进行研究，对目标问题的关键参数的影响以及系统的稳定性及可靠性等进行分析，并能够设计实验、分析数据，通过信息综合得到合理有效的结论。

5．使用现代工具：能够针对电子信息工程领域中的复杂工程问题，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，包括对电子信息工程专业领域复杂工程问题的预测和模拟，并能够理解其局限性。

6．工程与社会：能够基于工程相关背景知识进行合理分析，评价电子信息工程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。

7．环境和可持续发展：能够理解和评价针对电子信息工程专业领域的复杂工程问题的具体工程实践对环境、社会可持续发展的影响。

8．职业规范：具有人文社会科学素养、社会责任感，能够在电子信息工程专业领域的工程实践中理解并遵守工程职业道德和规范，履行责任。

9．个人和团体：能够在多学科背景下的团体中承担个体、团队成员以及负责人的角色。

10．沟通：能够就电子信息工程专业领域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。

11．项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。

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。

Ⅲ. Skills Profile

1. Engineering knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in basic theory of computer, electronic circuit and system, signal and information processing, electromagnetic wave and microwave technology, digital media technology etc., respectively to the solution of complex engineering problems in the field of electronic information engineering, such as RF and microwave system design or digital media technology and transmission etc.

2. Problem analysis: Identify, formulate, research literature and analyse complex engineering problems in the field of electronic information engineering, reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/development solutions: Design a reasonable solution for complex engineering problems in the field of electronic and information engineering, and design systems, components or processes that meet specified needs with appropriate consideration for public health, and safety, cultural, societal and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge in the field of electronic and information engineering and research methods including design of experiments, analysis and interpretation of data, and synthesis of information, such as the influence of key parameters of the target problem and the system stability and reliability etc., to provide valid conclusions.

5. Modern tool usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to complex engineering problems in the field of electronic information engineering, with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to electronic information engineering practice and solutions to complex engineering problems.

7. Environment and sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts in the field of electronic information engineering.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice in the field of electronic information engineering.

9. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work as a member and leader in a team, to manage projects and in multi-disciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in, independent and life-long learning in the broadest context of technological change.

四、专业特色

本专业注重学生创新实践能力和综合素质的培养。在培养方案上加强实践环节教学，以保证专业知识与专业技能培养相结合。本专业课程体系结构清晰，教学内容不仅涵盖基本理论还包括现代技术知识。本专业充分利用董事单位、西部国防军工企业和绵阳电子科技城的人才、科研技术、实践教学条件等资源，培养的学生具有非常突出的工程设计能力和应用实践能力。本专业就业口径宽，毕业生主要面向科研院所、企业、学校等单位，从事电子、通信系统、数字多媒体、电路系统等方面的设计研发、设备维护、项目管理、产品销售等工作。

Ⅳ. Specialty Features

The professional focuses on training of students in innovative practical ability and comprehensive quality, and enhancing teaching practice in training program to ensure the combination of professional knowledge and professional skills. The curriculum System structure of this professional is clear and the course includes a basic theories and modern technology. The professional bring up the students using the talents、scientific technology and practice teaching resources from the directorate of Southwest University of Science and Technology、west arms industry enterprise and science and technology city of Mianyang to obtain the outstanding ability of engineering design and application practices. Due to this wide range of professional employment, the graduates can be engaged in the design and development of electronic, communication, digital multimedia, circuit systems and other aspects of design and development, equipment maintenance, project management, product sales, etc. at research institutes, enterprises, schools and other workplace.

五、主干学科、专业核心课程、学位课程

主干学科： 信息与通信工程、电子科学与技术

专业核心课程：电磁场与电磁波 A，电磁场与电磁波实验 A，通信电路，通信电路实验，数字信号处理 A，现代通信原理 A，现代通信原理实验， FPGA 技术，天线与微波技术，随机信号分析等

学位课程：综合英语 2、程序设计基础 C（C 语言）、高等数学 A1、电路分析基础 A 1、 电路分析基础 A 2、数字电子技术、信号与系统 B、通信电路、电子技术课程设计、电子信息工程专业综合设计

Ⅴ. Core Disciplines and Courses

Core Disciplines: Information and Communication Engineering , Electronic Science and Technology

Core Courses: Electromagnetic Field and Electromagnetic Wave A, Experiments of Electromagnetic Field and Electromagnetic Wave A, communication Circuit, Experiments of communication Circuit，Digital Signal Processing A，Modern Communication Principle A, Experiments of Modern Communication Principles， FPGA Technology，Antenna and Microwave Technology，Stochastic Signal Analysis，etc.

Degree Course: Integrated English 2, C Language Programming Foundation C, Advanced Mathematics A1, Circuit Analysis Fundamentals A1, Circuit Analysis Fundamentals A2, Digital Electronic Technology, Signals and Systems B, communication Circuit, Course Design of Electronic Technology, Comprehensive Design of Electronic Information Engineering

六、学分分配

Ⅵ. Credits of Courses

类别 Type of Course	必修 Required			选修 Elective		集中实践环节 Practice Training	合计(比例) Total(%)
	通识教育 Basic Courses in General Education	学科（大类）教育 Basic Courses in General Discipline	专业教育 Specialty-oriented Courses	通识教育 Basic Courses in General Education	个性化教育 Characteristic Education Courses		
理论学分 Theory Credits	33	27	43	6	5	0	67%
实践学分 Practice Credits	9	5	11.5	0	3.5	27	33%
小计 Subtotal	42	32	54.5	6	8.5	27	170
比例（%） Proportion(%)	24.7%	18.8%	32.1%	3.5%	5%	15.9%	100%

七、专业教学计划

Ⅶ. Table of Teaching Schedule

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
通识教育平台 Basic Courses in General Education	必修 Required	1	JK160230	大学计算机（理工A） College Basic Computer（A, for Students of Science and Engineering）	2	32	32	0	0	0	1				考查
		2	FX160020	大学生心理健康教育 Mental Health Education of College Students	1	16	10	6	0	0	1				考试
		3	JK160380	计算机基本技能训练 Computer Application Skill Training	1	16	0	0	16	0	1				考试
		4	BW160010	军事技能训练 Military Skill Training	0.5	32	0	32	0	0	1				考查
		5	XG160010	入学教育 Entrance Education	0.5	8	0	8	0	0	1				考试
		6	MY160041	形势与政策1 Situation and Policy 1	0.5	8	8	0	0	0	1				考查
		7	MY160360	中国近现代史纲要 Chinese Modern History	2	32	32	0	0	0	1				考试
		8	WY160371	综合英语1 Integrated English 1	3	48	48	0	0	0	1				考试
		9	自选项目	体育项目1-4 Sports Items 1-4	4	128	0	128	0	0	1-4				考试
		10	GF160930	军事理论 Military Theory	0.5	36	16	0	0	20	2				考试
		11	MY160210	思想道德修养与法律基础 Thought Morals Tutelage and Legal Foundation	3	48	48	0	0	0	2				考试
		12	MY160042	形势与政策2 Situation and Policy 2	0.5	8	8	0	0	0	2				考查
		13	WY160372	综合英语2 Integrated English 2	3	48	48	0	0	0	2	★			考试
		14	JG161360	经济管理概论 Generality of Economics and Management	2	32	32	0	0	0	3				考试
		15	MY160080	马克思主义基本原理概论 Introduction to The Basic Principles of Marxism	3	48	48	0	0	0	3				考试

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		16	MY160280	思想政治理论课实践教学 The Practice Teaching of Ideological and Political Theory	2	32	0	32	0	0	3				考查
		17	MY160033	形势与政策 3 Situation and Policy 3	0.5	8	8	0	0	0	3				考查
		18	WY160203	综合英语 3 Integrated English 3	2	32	32	0	0	0	3				考试
		19	JW160010	创新思维与方法 Innovative Thinking and Methods	1	16	16	0	0	0	4				考试
		20	MY160110	毛泽东思想与中国特色社会主义理论体系概论 An Introduction to Mao Zedong Thought and The Theoretical System of Socialism With Chinese Characteristics	4	64	64	0	0	0	4				考试
		21	MY160024	形势与政策 4 Situation and Policy 4	0.5	8	8	0	0	0	4				考查
		22	WY160104	综合英语 4 Integrated English 4	2	32	32	0	0	0	4				考试
		23	TY160031	体能训练及体质达标测试 1 Physical Training& Physical Fitness Test 1	0.5	8	0	8	0	0	5				考试
		24	JW160020	就业创业基础 Employment and Entrepreneurship Foundation	2.5	40	40	0	0	0	6				考查
		25	TY160032	体能训练及体质达标测试 2 Physical Training& Physical Fitness Test 2	0.5	8	0	8	0	0	7				考试
	小计 Subtotal				42	788	530	222	16	20					
	选修 Elective		选修全校通识选修课 6 学分								2-8				
	小计 Subtotal				**6**	96	96	0	0	0					
合计 Total					48	884	626	222	16	20					
学科（大类）教育平台 Basic Courses in General Discipline	必修 Required	1	LX160071	高等数学 A1 Advanced Mathematics A1	6	96	96	0	0	0	1	★			考试
		2	LX160840	线性代数 A Linear Algebra A	3	48	48	0	0	0	1				考试
		3	XX161520	程序设计基础 C（C 语言） C Language Programming Foundation C	3	48	32	0	16	0	1	★			考试
		4	LX161390	大学物理 E University Physics E	5	80	80	0	0	0	2				考试
		5	LX160210	复变函数与积分变换 Functions of Complex Variable and Integral Transforms	2	32	32	0	0	0	2				考试
		6	LX160072	高等数学 A2 Advanced Mathematics A2	6	96	96	0	0	0	2				考试
		7	LX160051	大学物理实验 C1 University Physics Experiment C1	1	16	0	0	16	0	3				考查

课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
			8	LX160230	概率论与数理统计 B Probability and Mathematical Statistics B	3	48	48	0	0	0	3				考试
			9	GC160040	工程训练 D Engineering Training D	2	32	0	32	0	0	3				考查
			10	LX160052	大学物理实验 C2 University Physics Experiment C2	1	16	0	0	16	0	4				考查
合计 Total						32	512	432	32	48	0					
专业教育平台 Specialty-oriented Courses	必修 Required	专业基础课程 specialized basic courses	1	XX160390	电子工程技术基础 Introduction to Electronics Engineering Technology	3	48	24	0	24	0	1				考查
			2	XX160031	电路分析基础 A1 Circuit Analysis Fundamentals A1	2	32	32	0	0	0	2	★	◆		考试
			3	XX160041	电路分析基础实验 A1 Experiments of Circuit Analysis Fundamentals A1	0.5	8	0	0	8	0	2				考查
			4	XX161700	软件技术基础 A Software Technology Foundation A	2.5	40	32	0	8	0	2				考试
			5	XX160032	电路分析基础 A2 Circuit Analysis Fundamentals A2	2	32	32	0	0	0	3	★	◆		考试
			6	XX160042	电路分析基础实验 A2 Experiments of Circuit Analysis Fundamentals A2	0.5	8	0	0	8	0	3				考查
			7	XX160700	模拟电子技术 Analog Electronic Technology	3.5	56	56	0	0	0	3		◆		考试
			8	XX160710	模拟电子技术实验 Experiments of Analog Electronic Technology	1	16	0	0	16	0	3				考查
			9	XX161640	计算机网络 E Computer Network E	4	64	48	0	16	0	3				考试
			10	XX160880	数字电子技术 Digital Electronic Technology	3.5	56	56	0	0	0	4	★	◆		考试
			11	XX161740	数字电子技术实验 A Experiments of Digital Electronic Technology A	1	16	0	0	16	0	4				考查
			12	XX161170	信号与系统 B Signals and Systems B	4	64	64	0	0	0	4	★	◆		考试
			13	XX160610	计算机原理及应用 Computer Principles and Applications	3	48	48	0	0	0	5		◆		考试
			14	XX160620	计算机原理及应用实验 Experiments of Computer Principles and Applications	0.5	8	0	0	8	0	5				考查
	必修 Required	专业核心课程 specialized core courses	1	XX160140	电磁场与电磁波 A Electromagnetic Field and Electromagnetic Wave A	2.5	40	40	0	0	0	4		◆		考试
			2	XX160150	电磁场与电磁波实验 A Experiments of Electromagnetic Field and Electromagnetic Wave A	0.5	8	0	0	8	0	4				考查

课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
			3	XX161770	通信电路 communication Circuit	3	48	48	0	0	0	5	★	◆		考试
			4	XX161790	通信电路实验 Experiments of communication Circuit	1	16	0	0	16	0	5				考查
			5	XX161760	数字信号处理 A Digital Signal Processing A	3	48	40	0	8	0	5		◆		考试
			6	XX160930	随机信号分析 Stochastic Signal Analysis	2.5	40	40	0	0	0	5				考试
			7	XX160940	天线与微波技术 Antenna and Microwave Technology	3	48	40	0	8	0	5				考试
			8	XX160020	FPGA 技术 FPGA Technology	3	48	24	0	24	0	6				考试
			9	XX161880	现代通信原理 A Modern Communication Principles A	4	64	64	0	0	0	6		◆		考试
			10	XX161140	现代通信原理实验 Experiments of Modern Communication Principles	1	16	0	0	16	0	6				考查
		集中实践环节 Practice raining	1	XX160430	电子信息工程专业认识实习 Cognition Practice of Electronic Information Engineering	1	16	0	16	0	0	2				考查
			2	XX160400	电子技术课程设计 Course Design of Electronic Technology	2	32	0	32	0	0	4	★			考查
			3	XX160440	电子信息工程专业生产实习 Production Practice of Electronic Information Engineering	2	32	0	32	0	0	4				考查
			4	XX160770	软件技术课程设计 Course Design of Software Technology	2	32	0	32	0	0	5				
			5	XX161160	信号处理课程设计 Course Design of Signal Processing	2	32	0	32	0	0	6				考查
			6	XX160450	电子信息工程专业综合设计 Comprehensive Design of Electronic Information Engineering	3	48	0	48	0	0	**7**	★			考查
			7	XX160420	电子信息工程专业毕业实习 Graduation Practice of Electronic Information Engineering	3	48	0	48	0	0	8				考查
			8	XX160410	电子信息工程专业毕业设计 Graduation Design of Electronic Information Engineering	12	192	0	192	0	0	8				考查
合计 Total						81.5	1304	688	432	184	0					

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
个性化教育平台 Characteristic Education Courses	选修 Elective	本专业/跨专业选修课程共计 5.5 学分。2-7 学期开设。 1. 学生可根据自身发展方向修读本专业或跨专业个性化平台选修课。 2. 个性化平台选修课详见《西南科技大学个性化平台选修课程选课指导与修读手册》。													
	创新创业实践必修 Required	创新创业实践系列项目（学术报告/科研项目/创新创业项目/科技竞赛等）共 3 学分。1-8 学期开设。 Serial Program on Innovation and entrepreneurship practice (academic presentation/research project/innovation and entrepreneur program/ Scientific and technical contest, etc.), in total 3 credits.													
合计 Total					8.5	136	64	56	16	0					
共计 Total					170	2836	1810	742	264	20					

注：1. 标注★的为“学位课程”，标注◆的为“辅修课程”，标注▲的为“双学位课程”；标注△的为双语课程。

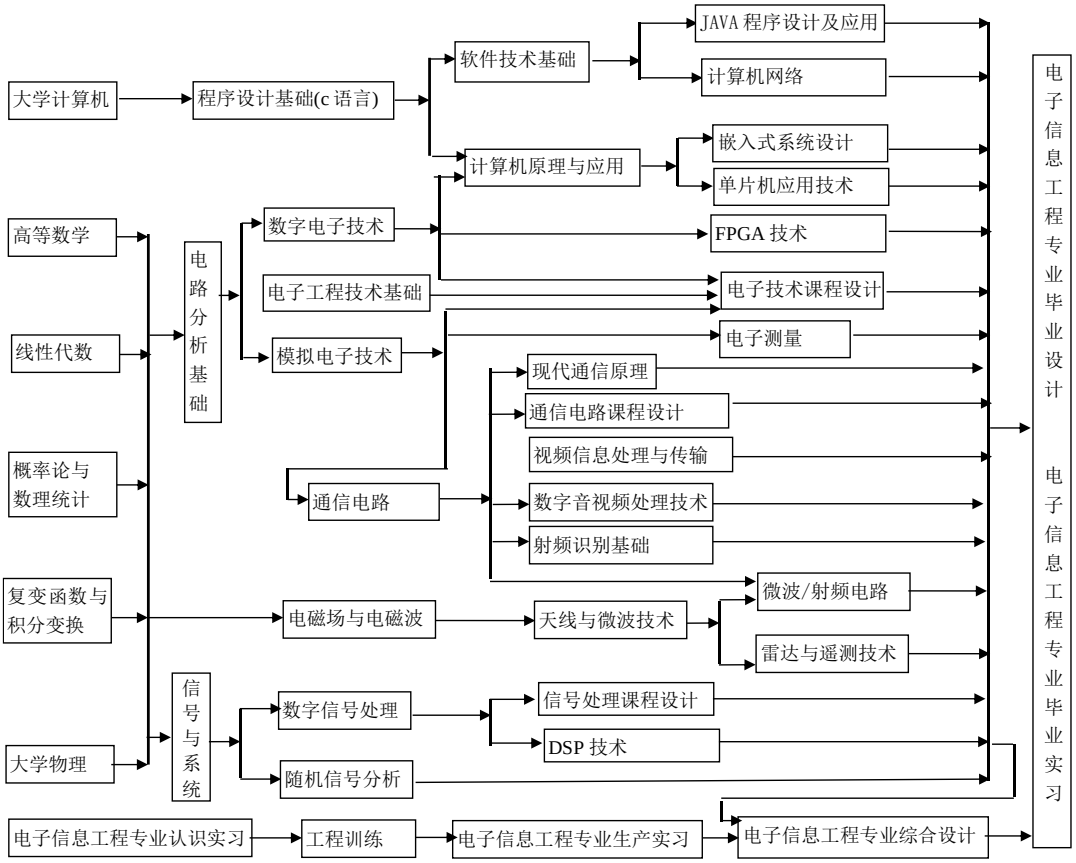
2. 课程考核方式分为考试和考查。

Remarks:

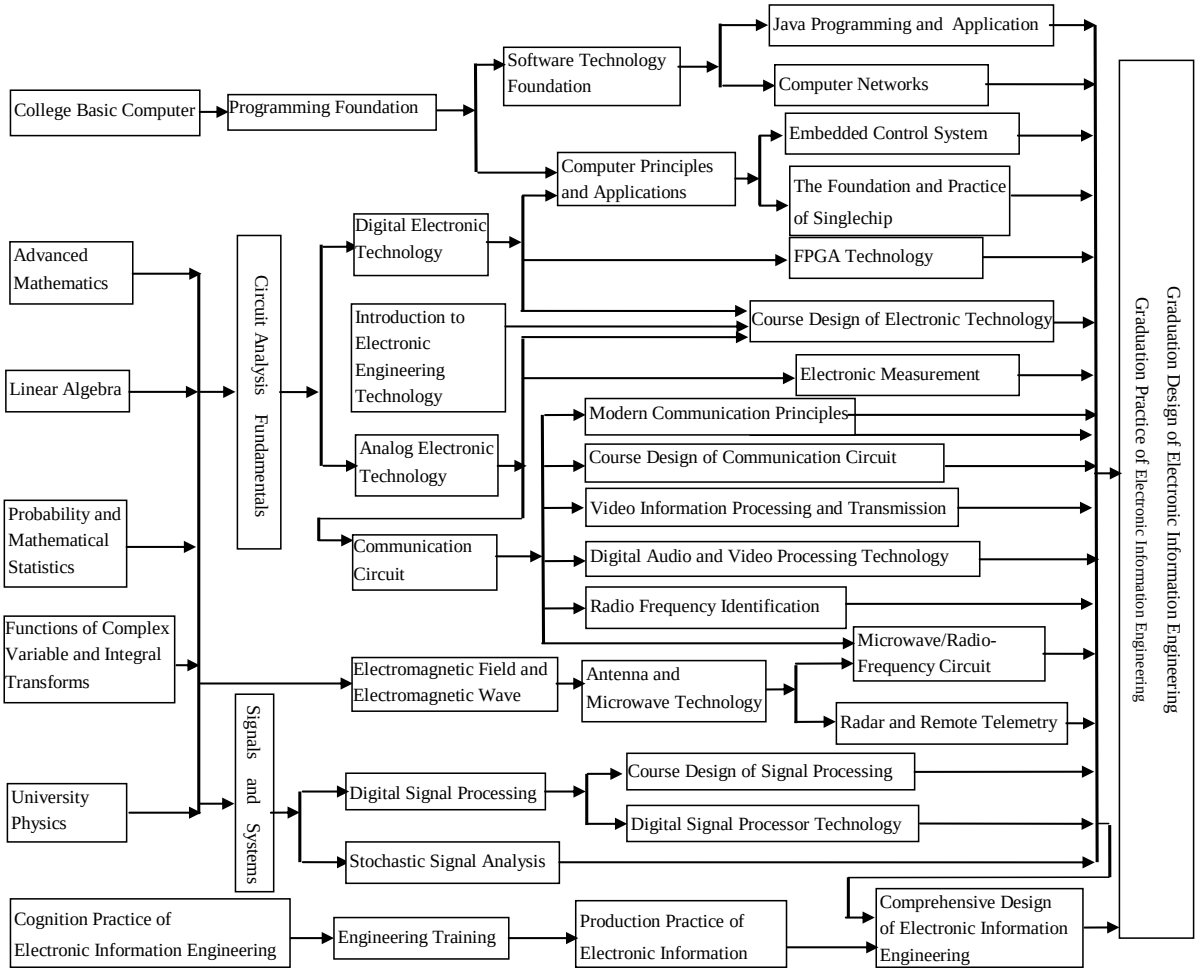
1.★stands for “degree course”，◆ stands for “minor course”，▲ stands for “bi-language course”，△ stands for the course is in bi-language.

2.“Examination on Mode” includes “examination” or “check”.

八、选课指导（课程配置流程图）



Ⅷ.Guidance for Selecting Courses



九、各学期应修学分分布表

Ⅸ. Credit's Table for each Semester

学期 Semester	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th	学分合计 Total
建议应修学分 Credits	27.5	28	28	26	22.5	14	9	15	170

十、说明

选修课的修学计划须在班主任和专业导师指导下完成。

Ⅹ. Instructions

Elective course plan must be formulated under the directions from class adviser and professional supervisor.

*十一、培养标准实现矩阵

*Ⅺ. Training standard implementation matrix

培养要求与实现途径矩阵

		知识与能力要求	实现环节
1.知识体系	1.1 掌握一般性和专门的工程技术知识以及一定的人文和社会科学知识	1.1.1 数学和相关自然科学； 1.1.2 工程技术，包括电子信息工程相关学科知识，侧重于应用工程技术知识解决实际工程问题； 1.1.3 熟悉电气工程相关标准； 1.1.4 人文和社会科学，较熟练掌握一门外语，可运用其阅读本专业相关的外文资料，并对相关技术问题能够基本进行沟通和交流；	大学计算机、综合英语、高等数学、线性代数 A、概率论与数理统计 B、复变函数与积分变换、大学物理 C、大学物理实验（C1、C2）、素质选修、经济管理概论等
	1.2 掌握扎实的工程基础与专业知识	1.2.1 掌握电路原理、模拟电子技术、数字电子技术等课程知识，熟悉其实验方法和技术，掌握电子电路的设计与开发技术； 1.2.2 掌握电磁场与波、数字信号处理、信号处理、通信电路、微波工程基础等专业基础知识与应用； 1.2.3 掌握计算机应用系统、FPGA 系统等现代电子系统知识与应用； 1.2.4 掌握数字媒体技术以及传输的分析方法与处理技术，或者射频与微波电路的设计与开发技术，或者嵌入式系统开发与应用等电子信息工程相关工程问题解决方法和技术。	电路分析基础、模拟电子技术、数字电子技术、信号与系统、数字信号处理、电磁场与电磁波、通信电路、现代通信原理、数字音视频处理基础、视频信号传输与处理、天线与微波技术、微波/射频电路、计算机原理及应用、C 语言程序设计、FPGA 技术、DSP 技术、单片机原理与应用、嵌入式系统设计以及相关课程设计与实验等
	1.3 了解工程领域的技术发展和技术标准	1.3.1 了解电子信息工程相关技术的发展现状和趋势动态，了解新技术、新产品、新方法； 1.3.2 了解电子电路和信息处理的现代设计方法，了解电子信息工程领域的技术标准，了解质量管理和质量保证体系。	电子信息工程专业认识实习、生产实习、创新思维与方法、创新创业实践系列项目等
2、能力素质要求	2.1 具有选用适当的理论和实践方法解决工程实际问题的能力	2.1.1 了解市场、用户的需求变化以及技术发展，能编制支持产品形成过程的策划和改进方案； 2.1.2 能参与工程解决方案的设计、开发，考虑成本、质量、环保性、安全性、可靠性、外形、适应性以及对环境的影响，找出、评估和选择完成工程任务所需的技术、工艺和方法，确定解决方案； 2.1.3 能参与制定实施计划； 2.1.4 能实施解决方案，完成工程任务，并参与相关评价； 2.1.5 能参与改进建议的提出，并主动从结果反馈中学习； 2.1.6 具有较强的创新意识和进行产品（工程项目）开发和设计、技术改造与创新的初步能力。	创新思维与方法、就业创业基础、工程训练、创新创业实践系列项目、毕业设计、电子信息工程专业生产实习、毕业实习、电子技术课程设计、信号处理课程设计以及电子信息工程专业综合设计、经济管理概论
	2.2 具备参与项目及工程管理的能力	2.2.1 具有一定的质量、环境、职业健康安全和法律意识，在法律法规规定的范畴内，按确定的相关标准和程序要求开展工作； 2.2.2 使用合适的管理方法、管理计划和预算，组织任务、人力和资源； 2.2.3 具备应对危机与突发事件的初步能力，能够发现质量标准、程序和预算的变化，并采取恰当的行动； 2.2.4 参与管理、协调工作团队，确保工作进度； 2.2.5 参与评估项目，提出改进建议。	就业创业基础、创新创业实践系列项目、毕业设计、毕业实习、电子技术课程设计、信号处理课程设计、电子信息工程专业综合设计以及经济管理概论等
	2.3 具备有效的沟通与交流能力	2.3.1 能够使用技术语言，在跨文化环境下进行沟通与表达； 2.3.2 能够进行电子信息类工程文件的编纂，如：可行性分析报告、项目任务书、实习计划等，并可进行说明与阐释； 2.3.3 具备较强的人际交往和沟通能力，能够控制自我并了解和理解他人需求和意愿； 2.3.4 具备较强的适应能力，自信、灵活地处理新的和不断变化的人际环境和工作环境； 2.3.5 能够跟踪到电子信息工程领域的最新技术发展，具备收集、分析、判断、归纳和选择国内外相关技术信息的能力； 2.3.6 具有团队合作精神，并具有一定的协调、管理、竞争与合作能力。	综合英语、创新创业实践系列项目、形势与政策、军事课、体育项目、创新思维与方法、就业创业基础等

	2.4 具备良好的职业道德和社会责任感	2.4.1 掌握一定的职业健康安全和环境的法律法规及标准知识，恪守职业道德规范和所属职业体系的职业行为准则； 2.4.2 具有良好的质量、安全、服务和环保意识，承担有关健康、安全和福利等事务的责任； 2.4.3 具有检查自身的发展需求、制定并实施自身职业发展计划的能力。	思想道德修养与法律基础、中国近现代史纲要、毛泽东思想与中国特色社会主义理论体系概论、马克思主义基本原理、形势与政策、就业创业基础、思想政治理论课实践教学等

电气工程及其自动化专业培养方案

Undergraduate Program for Specialty in Electrical Engineering and Electrical engineering

专业负责人：张晓琴　　主管院长：姚远程　　院学术委员会主任：邹传云

Director of Specialty:Xiaoqin Zhang

Executive Dean:Yuancheng Yao

Academic Committee Director:Chuanyun Zou

一、修业年限及授予学位名称

学制 4 年，最低毕业学分 170，允许学习年限为 3-6 年，授予工学学士学位。

Ⅰ. Length of Schooling and Degree

Duration:4years

Credits for graduation: 170

Studying period: 3 to 6 years

Degrees Conferred: Bachelor of Engineering

二、培养目标

本专业培养能够综合运用自然科学、工程科学的基础理论与专业知识，分析和解决电气工程及其自动化专业领域的复杂工程问题，具备在电气工程及其相关领域进行科学研究、技术开发、系统运行、工程设计、项目管理等方面的工作能力，能在团队中进行有效交流与合作，具有较高的思想政治素质、社会责任感、职业道德、创新意识和善于学习的应用型高层次人才。

Ⅱ. Educational Objectives

Thespecialty aims at bringing up the "Application-oriented high-level talents", who are capable of comprehensively applying the basic theory and professional knowledge of natural science and engineering science to analyze and solve complex engineering problems in the field of electrical engineering, as well as having the ability to carry out scientific research, technical development, system operation, engineering design, project management and other aspects in electrical engineering or related engineering field.They should also possess the following qualities: to be able to communicate and cooperate effectively in the team, have high ideological and political quality, social responsibility, professional ethics, innovative consciousness and be good at learning.

三、培养规格及要求

毕业生应获得以下几方面的知识和能力：

1．工程知识：能够将数学、自然科学、工程基础和专业知识用于解决复杂电气工程问题。

2．问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析复杂电气工程问题，以获得有效结论。

3．设计/开发解决方案：能够设计针对复杂电气工程问题的解决方案，设计出满足特定要求的系统，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。

4．研究：能够基于科学原理并采用科学方法对复杂电气工程问题进行研究，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。

5．使用现代工具：能够针对电气工程领域中的复杂工程问题，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，包括对电气工程领域复杂工程问题的预测和模拟，并能够理解其局限性。

6．工程与社会：能够基于工程相关背景知识进行合理分析，评价电气工程及其自动化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。

7.环境和可持续发展:能够理解和评价针对复杂电气工程问题的具体工程实践对环境、社会可持续发展的影响。

8．职业规范：具有人文社会科学素养、社会责任感，能够在电气工程及其自动化专业领域的工程实践中理解并遵守工程职业道德和规范，履行责任。

9.个人和团体:能够在多学科背景下的团体中承担个体、团队成员以及负责人的角色。

10．沟通：能够就复杂电气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。

11．项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。

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。

Ⅲ. Skills Profile

Thegraduatesshouldacquirethefollowingknowledgeandabilities:

1. Engineering knowledge: the ability to use mathematics, natural sciences, engineering foundations and expertise to solve complex electrical engineeringproblems;

2. Problem analysis: able to apply the basic principles of mathematics, natural science and engineering science; recognizing, expressing and analyzing complex electrical engineering problemsthrough literature research, in order to obtain valid conclusions;

3. Design/development of solutions: able to devise solutions of complex electrical engineering problems and design systems to meet specific requirements; in the process, capable of reflecting innovation consciousness and considering the social, health, safety, legal, cultural, environmental and other factors.

4. Research: able to study complex electrical engineering problems based on scientific principles and scientific methods, including experiment design, data analysis and interpretation, andreasonable and effective conclusion obtaining through comprehensive information.

5. Modern tool utilization: able to develop, select and use proper technology, resources, modern engineering tools and information technology to solve complex engineering problems in the field of electrical engineering, including predicting and simulating of these problems, as well as to understand their limitations.

6. Engineering and society: can carry on reasonable analysis based on related engineering background knowledge, evaluate influence ofprofessional engineering practice and complex engineering solutions of electrical engineering and automation fieldon society, health, safety, law and culture, and understand the responsibilities.

7. Environment and sustainable development: the ability to understand and evaluate the impact of concrete engineering practices of complex electrical engineering problems on the environment and social sustainability.

8. Professional ethics: able to possess humanistic and social science literacy and social responsibility, understand and abide by engineering ethics and norms in the engineering practice of electrical engineering and automation specialty, and fulfill responsibilities.

9. Individuals and groups: able to take on the role of individuals, team members, and responsible person in a multi-disciplinary community.

10. Communication: able to communicate effectively with the industry peers and the social public communication on complex electrical engineering problems, including writing reports, designing documents, presenting speech and clearly expressing or responding to commands;have a certain international vision and able to communicate in a cross-cultural context.

11. Project management: understand and master the engineering management principles and economic decision-making methods, and can apply them in multi-disciplinary environment.

12. Lifelong learning: possess senses of self-learning and lifelong learning, and able to learn constantly and

adapt to development.

四、专业特色

本专业强调强电和弱电并重，软件和硬件兼备，元件和系统结合，充分利用产学研联合办学的体制优势和地域优势，与董事单位在实习基地建设、设备共享、学术交流和科学研究等方面，形成了长期的合作关系。依托科技竞赛平台和实验室资源，着力培养学生的工程应用能力。

Ⅳ. Specialty Features

The specialtyputs equal importance on electric and electronic, emphasizes both software and hardware and combines components and systems together. Making full use of the geographical advantages and the institutional advantages of the co-education of industry and university, the specialty has formed long-term cooperation relationship with director unit in practice basis construction, instruments sharing, academic exchange and scientific research. Relying on science and technology competition platform and laboratory resources, the specialty focuses on cultivating students' engineering application ability.

五、主干学科、专业核心课程、学位课程

主干学科：电气工程、控制科学与工程、计算机科学与技术

专业核心课程：电力电子技术 A、供配电系统、电力拖动自动控制系统、电气控制及PLC、电机学、电力系统分析A

学位课程：综合英语4、高等数学A2、程序设计基础B（C语言）、电路分析基础A1、电路分析基础A2、数字电子技术、电机学、电力电子技术A、电力系统分析A、电气工程及其自动化专业综合设计

Ⅴ. Core Disciplines and Courses

Core Disciplines: Electrical Engineering, Control Science and Engineering, Computer Science and Technology.

Core Courses: Power Electronic Technology A，Power Supply and Distribution System，Control Systems of Electric Drives，Electrical Control and PLC，Electrical Machinery，Power System Analysis A.

Degree Course： Integrated English 4, Advanced Mathematics A2, C Language Programming Foundation B, Fundamentals of Circuit AnalysisA1,Fundamentals of Circuit AnalysisA2, Digital Electronics Technology, Electrical Machinery, Power Electronic Technology A, Power System Analysis A, Comprehensive Design of Electrical Engineering and Electrical engineering.

六、学分分配

Ⅵ. Credits of Courses

类别 Type of Course	必修 Required			选修 Elective		集中实践环节 Practice Training	合计(比例) Total(%)
	通识教育 Basic Courses in General Education	学科（大类）教育 Basic Courses in General Discipline	专业教育 Specialty-oriented Courses	通识教育 Basic Courses in General Education	个性化教育 Characteristic Education Courses		
理论学分 Theory Credits	33	29	38.5	6	10.5	0	68.9
实践学分 Practice Credits	9	5	7	0	4	28	31.1
小计 Subtotal	42	34	45.5	6	14.5	28	170
比例（%） Proportion(%)	24.7	20	26.7	3.5	8.5	16.6	100

七、专业教学计划

Ⅶ. Table of Teaching Schedule

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
通识教育平台 Basic Courses in General Education	必修 Required	1	XG160010	入学教育 Entrance Education	0.5	8	0	8	0	0	1				考试 exam
		2	GF160930	军事技能训练 Military Skill Training	0.5	32	0	32	0	0	1				考试 exam
		3	BW160010	军事理论 Military Theory	0.5	36	16	0	0	20	2				考试 exam
		4	自选项目	体育项目 1-4 Sports items	4	128	0	128	0	0	1-4				考试 exam
		5	TY160031	体能训练及体质达标测试 1 Physical Training& Physical Fitness Test 1	0.5	8	0	8	0	0	1				考试 exam
		6	TY160032	体能训练及体质达标测试 2 Physical Training& Physical Fitness Test 2	0.5	8	0	8	0	0	2				考试 exam
		7	MY160210	思想道德修养与法律基础 Thought Morals Tutelage and Legal Foundation	3	48	48	0	0	0	2				考试 exam
		8	MY160360	中国近现代史纲要 Chinese Modern History	2	32	32	0	0	0	1				考试 exam
		9	MY160080	马克思主义基本原理概论 Introduction to The Basic Principles of Marxism	3	48	48	0	0	0	3				考试 exam
		10	MY160110	毛泽东思想与中国特色社会主义理论体系概论 An Introduction to Mao Zedong Thought and The Theoretical System of Socialism With Chinese Characteristics	4	64	64	0	0	0	4				考试 exam
		11	MY160041	形势与政策 1 Situation and Policy 1	0.5	8	8	0	0	0	1				考查 non-exam
		12	MY160042	形势与政策 2 Situation and Policy 2	0.5	8	8	0	0	0	2				考查 non-exam
		13	MY160033	形势与政策 3 Situation and Policy 3	0.5	8	8	0	0	0	3				考查 non-exam
		14	MY160024	形势与政策 4 Situation and Policy 4	0.5	8	8	0	0	0	4				考查 non-exam
		15	MY160280	思想政治理论课实践教学 The Practice Teaching of Ideological and Political Theory	2	32	0	32	0	0	3				考查 non-exam
		16	WY160371	综合英语 1 Integrated English 1	3	48	48	0	0	0	1				考试 exam
		17	WY160372	综合英语 2 Integrated English 2	3	48	48	0	0	0	2				考试 exam
		18	WY160203	综合英语 3 Integrated English 3	2	32	32	0	0	0	3				考试 exam
		19	WY160104	综合英语 4 Integrated English 4	2	32	32	0	0	0	4	★			考试 exam
		20	JK160230	大学计算机（理工 A） College Basic Computer（A, for Students of Science and Engineering）	2	32	32	0	0	0	1				考查 non-exam
		21	JK160380	计算机基本技能训练 Computer Application Skill Training	1	16	0	0	16	0	1				考试 exam

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		22	FX160020	大学生心理健康教育 Mental Health Education of College Students	1	16	10	6	0	0	1				考试 exam
		23	JW160020	就业创业基础 Employment and Entrepreneur Ship Foundation	2.5	40	40	0	0	0	3				考查 non-exam
		24	JW160010	创新思维与方法 Innovative thinking and methods	1	16	16	0	0	0	4				考试 exam
		25	JG161360	经济管理概论 Generality of Economics and Management	2	32	32	0	0	0	3				考试 exam
	小计 Subtotal				**42**	**788**	**530**	**222**	**16**	**20**					
	选修 Elective	选修全校通识选修课 6 学分 basic courses in general education: 6 credits									2-8				
	小计 Subtotal				**6**	**96**	**96**	**0**	**0**	**0**					
合计 Total					**48**	**884**	**626**	**222**	**16**	**20**					
学科（大类）教育平台 Basic Courses in General Discipline	必修 Required	1	LX160071	高等数学 A1 Advanced Mathematics A1	6	96	96	0	0	0	1				考试 exam
		2	LX160072	高等数学 A2 Advanced Mathematics A2	6	96	96	0	0	0	2	★			考试 exam
		3	LX160230	概率论与数理统计 B Probability and Mathematical Statistics B	3	48	48	0	0	0	3				考试 exam
		4	LX160840	线性代数 A Linear Algebra A	3	48	48	0	0	0	2				考试 exam
		5	LX160210	复变函数与积分变换 Complex Variable Function and Integral Transform	2	48	48	0	0	0	3				考试 exam
		6	LX161390	大学物理 E University Physics E	5	80	80	0	0	0	2				考试 exam
		7	LX160051	大学物理实验 C1 University Physics Experiment C1	1	16	0	0	16	0	3				考查 non-exam
		8	LX160052	大学物理实验 C2 University Physics Experiment C2	1	16	0	0	16	0	4				考查 non-exam
		9	XX161520	程序设计基础 C（C 语言） C Language Programming Foundation C	3	48	32	0	16	0	1	★			考试 exam
		10	GC160040	工程训练 D Engineering Training D	2	32	0	32	0	0	3				考查 non-exam
		11	ZZ160450	工程制图 C Engineering Drawing C	2	32	32	0	0	0	1				考查 non-exam
合计 Total					**34**	**544**	**464**	**32**	**48**	**0**					
专业教育平台 Specialty-oriented Course	必修 Required	专业特色课 specialized	1	XX160031	电路分析基础 A1 Circuit Analysis Fundamentals A1	2	32	32	0	0	0	2	★	◆		考试 exam

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		2	XX160032	电路分析基础 A2 Circuit Analysis Fundamentals A2	2	32	32	0	0	0	3				考试 exam
		3	XX160041	电路分析基础实验 A1 Experiments of Circuit Analysis Fundamentals A1	0.5	8	0	0	8	0	2				考查 non-exam
		4	XX160042	电路分析基础实验 A2 Experiments of Circuit Analysis Fundamentals A2	0.5	8	0	0	8	0	3				考查 non-exam
		5	XX160700	模拟电子技术 Analog Electronic Technology	3.5	56	56	0	0	0	3		◆		考试 exam
		6	XX160880	数字电子技术 DigitalElectronic Technology	3.5	56	56	0	0	0	4	★	◆		考试 exam
		7	XX160710	模拟电子技术实验 Experiments of Analog Electronic Technology	1	16	0	0	16	0	3				考查 non-exam
		8	XX161740	数字电子技术实验 A Experiments of Digital Electronic Technology A	1	16	0	0	16	0	4				考查 non-exam
		9	XX161180	信号与系统 D Signals and Systems D	2	32	32	0	0	0	4		◆		考试 exam
		10	XX160610	计算机原理及应用 Computer Principles and Applications	3	48	48	0	0	0	5				考试 exam
		11	XX160620	计算机原理及应用实验 Experiments of Computer Principles and Applications	0.5	8	0	0	8	0	5				考查
		12	XX161940	自动控制理论 D Automatic Control Theory D	3.5	56	48	0	8	0	5				考试 exam
		13	XX160510	工程电磁场 Project of Electromagnetic Fields	2.5	40	40	0	0	0	4		◆		考试 exam
	专业核心课程 specialized core courses	1	XX161560	电力电子技术 A Power Electronic Technology A	3	48	40	0	8	0	5	★	◆		考试 exam
		2	XX161610	供配电系统 Power Supply and Distribution System	3	48	40	0	8	0	5				考试 exam
		3	XX161570	电力拖动自动控制系统 Control Systems of Electric Drives	3	48	40	0	8	0	6				考试 exam
		4	XX161590	电气控制及 PLC Electrical Control and PLC	2.5	40	32	0	8	0	6				考试 exam
		5	XX161580	电力系统分析 A Power System Analysis A	4	64	56	0	8	0	6	★	◆		考试 exam

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		6	XX161970	电机学 Electrical Machinery	4.5	72	64	0	8	0	4	★	◆		考试 exam
	集中实践环节 Practice raining	1	XX160340	电气工程及其自动化专业认识实习 Cognition Practice of Electrical Engineering and Electrical engineering	1	16	0	16	0	0	2				考查 non-exam
		2	XX160350	电气工程及其自动化专业生产实习 Production Practice of Electrical Engineering and Electrical engineering	2	32	0	32	0	0	6				考查 non-exam
		3	XX160330	电气工程及其自动化专业毕业实习 Graduation Practice of Electrical Engineering and Electrical engineering	3	48	0	48	0	0	8				考查 non-exam
		4	XX160320	电气工程及其自动化专业毕业设计 Graduation Design of Electrical Engineering and Electrical engineering	12	192	0	192	0	0	8				考查 non-exam
		5	XX160400	电子技术课程设计 Course Design of Electronic Technology	2	32	0	32	0	0	4				考查 non-exam
		6	XX161950	电力电子与供配电系统课程设计 Course Design of Power Electronic and Power Supply and Distribution System	2	32	0	32	0	0	5				考查 non-exam
		7	XX161960	电力系统课程设计 Course Design of Power System	2	32	0	32	0	0	6				考查 non-exam
		8	XX161500	PLC 项目实践 Project practice of PLC	1	16	0	16	0	0	6				考查 non-exam
		9	XX160360	电气工程及其自动化专业综合设计 Comprehensive Design of Electrical Engineering and Electrical engineering	3	48	0	48	0	0	7	★	◆		考查 non-exam
合计 Total					**73.5**	**1176**	**616**	**448**	**112**	**0**					
个性化教育平台、Characteristic Education Courses	选修 Elective	本专业/跨专业选修课程共计 11.5 学分。1-8 学期开设。 1.学生可根据自身发展方向修读本专业选修课或跨专业修读全校其他专业开设的个性化平台选修课。 2.跨专业个性化化平台选修课详见《西南科技大学个性化平台选修课程选课指导与修读手册》。 12.5 credits for elective courses of this major/cross major, in semester 1 to 8; 1. students can attend elective courses of their own major or characteristics education courses of other majors according to their owndevelopment 2. pleases check "Guidance to characteristics education courses of Southwest University of Science and Technology" for cross-major characteristics education courses												
	创新创业实践必修 Required	创新创业实践系列项目（学术报告/科研项目/创新创业项目/科技竞赛等）共 3 学分。1-8 学期开设。 SerialProgramonInnovationandentrepreneurshippractice (academicpresentation/researchproject/innovationandentrepreneurprogram/ Scientificandtechnicalcontest, etc.), intotal 3 credits.												
合计 Total					**14.5**										

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
共计 Total					170										

注：

1、“学位课”栏用★标注；“双学位课”栏用▲标注；“辅修课程”栏用◆标注；考核方式栏填写“考试”或“考查”。

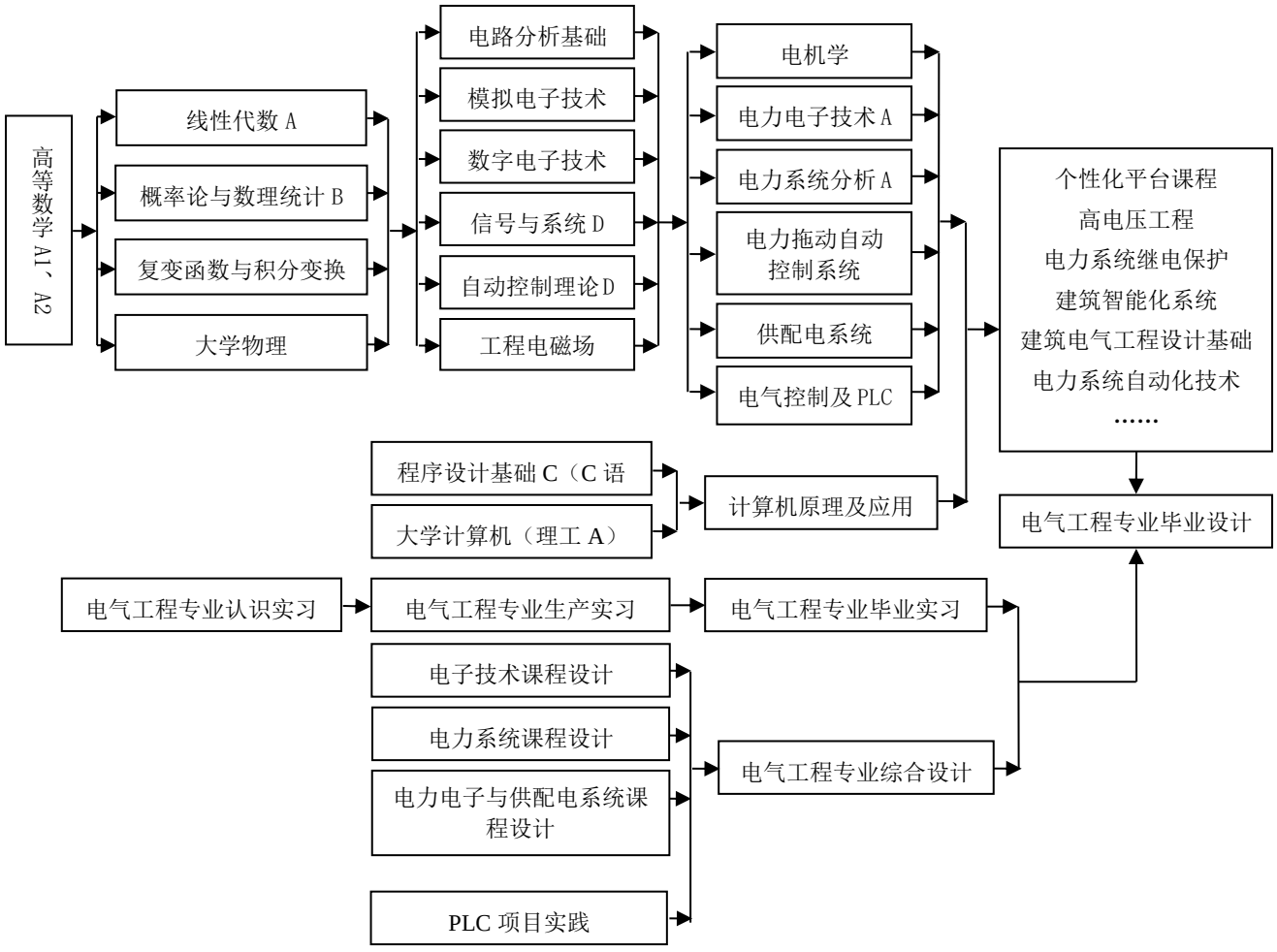
2、课程名称后有“☆”的表示该课程是全英文教学课程；课程名称后有“△”的表示该课程是双语教学课程。

Remark:

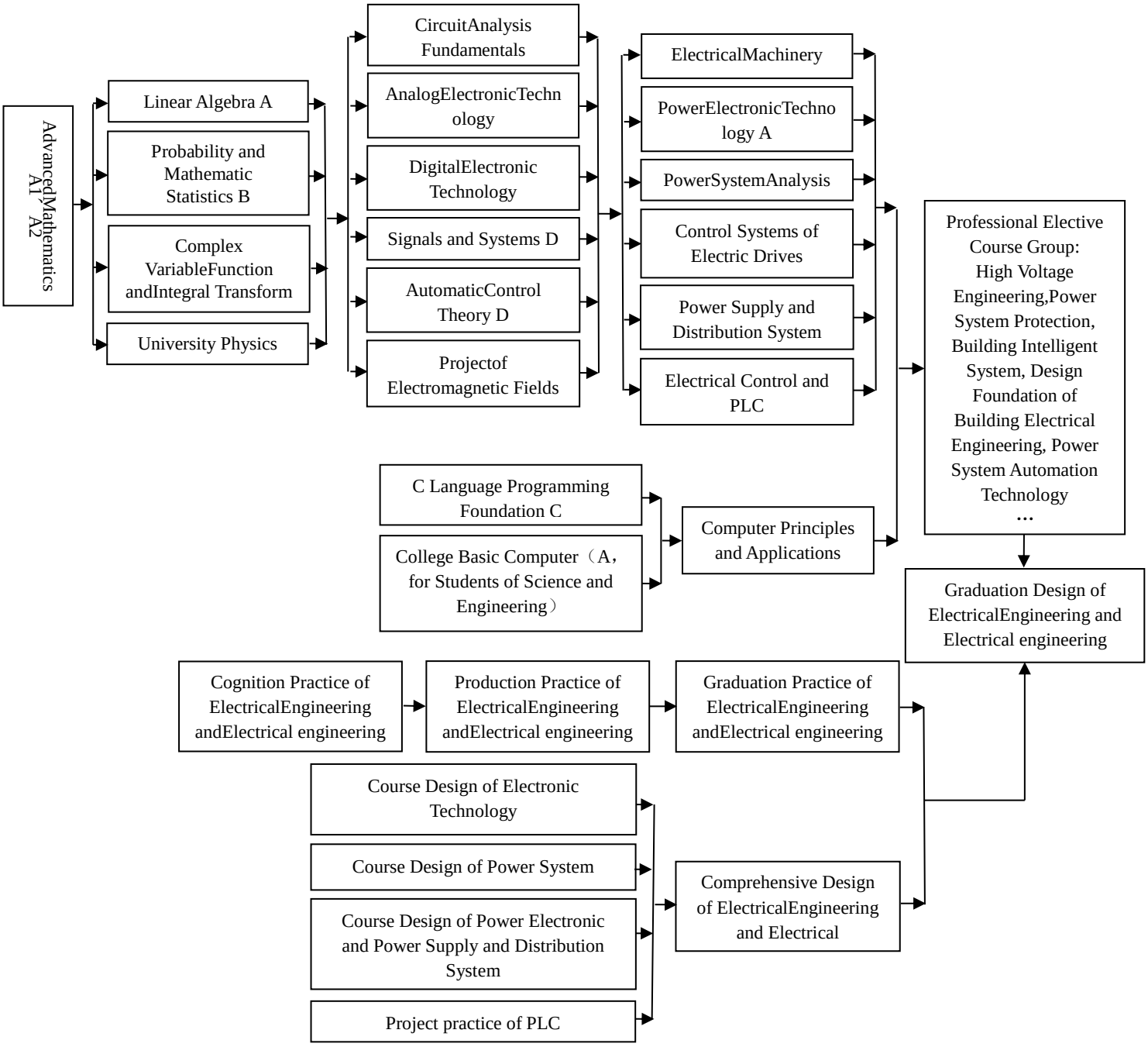
1、 Column of “degree course”is marked with ★; Column of “double degree course”is marked with ▲; Column of “minor course”is marked with ◆; Column of examination mode is filled with "exam" or " non-exam".

2、 Marked with “☆”means this is an English teaching course;Marked with “△”means this is a bilingual course.

八、选课指导（课程配置流程图）



Ⅷ.Guidance for Selecting Courses



九、各学期应修学分分布表

Ⅸ. Credit's Table for each Semester

学期 Semester	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th	学分合计 Total
建议应修学分 Credits	23	26	28	25	21	21	11	15	170

十、说明

选修课的修学计划须在班主任和专业导师指导下完成。

Ⅹ. Instructions

Elective course plan must be formulated under the directions from class adviser and professional supervisor.

生物医学工程专业培养方案
Undergraduate Program for Specialty in Biomedical Engineering

专业负责人：周颖玥　　主管院长：姚远程　　院学术委员会主任：邹传云

Director of Specialty: Yingyue Zhou
Executive Dean: Yuancheng Yao
Academic Committee Director: Chuanyun Zou

一、修业年限及授予学位名称

学制 4 年，最低毕业学分 170，允许学习年限为 3-6 年。授予工学学士学位。

Ⅰ.Length of Schooling and Degree:

Length of schooling: 4 years. The minimum graduation credits are 170, allowing the study period of 3-6 years.

Degrees Conferred: Bachelor of Engineering

二、培养目标

本专业培养能够综合运用自然科学、工程科学的基础理论与专业知识，分析和解决生物医学工程专业领域的复杂工程问题，具备在生物医学工程或相关工程领域进行技术开发、系统集成、设备运行维护、工程项目的实施管理等方面的工作能力，能在团队中进行有效交流与合作，具有较高的思想政治素质、社会责任感、职业道德、创新意识和善于学习的应用型高层次人才。

毕业 5 年左右的预期目标：

1. 道德修养：具有较高的思想政治素质、职业道德、社会责任感，能够在工程实践中遵守职业规范，履行责任；

2. 问题解决：能够综合运用自然科学、工程科学的基础理论与专业知识，分析和解决生物医学工程领域的复杂工程问题；

3. 协作能力：具有良好的团队协作能力和一定的领导能力，能够有效地进行交流合作，具备一定的国际视野；

4. 学习能力：具有自主学习和终身学习的意识，能够不断学习，实现工作能力的自我提升；

5. 社会服务：适应社会竞争与合作，愿意且能够为地方经济、国家建设服务，能够从事生物医学工程或相关工程领域的技术开发、系统集成、设备运行维护、工程项目的实施管理等工作。

Ⅱ.Educational Objectives

The specialty “Biomedical Engnieering” (BME) aims at bringing up the "Application-oriented high-level talents", who are capable of comprehensively applying the basic theory and professional knowledge of natural science and engineering science to analyze and solve complex engineering problems in the field of biomedical engineering, as well as having the ability to carry out technical development, system integration, equipment operation and maintenance, project management and other aspects in biomedical engineering or related engineering field. They should also possess the following qualities: to be able to communicate and cooperate effectively in the team, have high ideological and political quality, social responsibility, professional ethics, innovative consciousness and be good at learning.

Expected targets after 5 years of graduation:

(1) Moral cultivation: with a high ideological and political quality, professional ethics and social responsibility, able to abide by professional standards and fulfill their responsibilities in engineering practice;

(2) Problem solving: able to comprehensively utilize the basic theories and professional knowledge of natural science and engineering science to analyze and solve complex engineering problems in the biomedical engineering field;

(3) Cooperation ability: with good teamwork ability and certain leadership skills, be able to communicate and cooperate effectively and have a certain international vision;

(4) Learning ability: have the awareness of self-learning and lifelong learning, be able to keep learning and realize self-improvement of work ability;

(5) Social services: have the ability to adapt to the social competition and cooperation, willing and able to serve the local economy, national construction, master the skill to engage in technology development, system integration, equipment operation maintenance, the implementation of the project management and other aspects in biomedical engineering or related engineering field.

三、 培养规格及要求

毕业生应获得以下几方面的知识和能力：

1. 工程知识：能够将数学、自然科学、工程学等领域的理论、方法等知识与生物医学工程领域中的特定问题相结合，并将这些知识用于医学仪器或计算机辅助诊断设备研发或应用等复杂工程问题中。

2. 问题分析：能够根据生物医学工程领域特定问题的属性，通过文献研究、数学建模、工程推理等手段，识别和表达待解决的医学信号传感、检测、识别或处理等复杂工程问题，并分析和判断问题中的难疑点，以获得正确的原理模型等有效结论。

3. 设计/开发解决方案：针对医学仪器或计算机辅助诊断设备研发过程中所出现的复杂工程问题，设计满足需求的系统方案框图、硬件电路图、算法实现流图等，并能够在设计环节中融入创新点，同时全面考虑对社会、健康、安全、法律、文化以及环境等方面所可能产生的影响，从而优化系统或设备的整体性能。

4. 研究：针对生物医学工程领域中的信号传感、检测、识别或处理等问题的一般性和特殊性，采用数学建模、软硬件仿真、数据结果分析、实验设计等科学方法，研究目标问题的科学原理、关键参数的影响以及系统的稳定性及可靠性等，并能综合对目标问题各方面的研究获得合理有效的研究思路或结论。

5. 使用现代工具：针对生物医学工程领域中的医学信号传感、检测、识别或处理等复杂工程问题，选择与使用恰当的传感元器件、相关软硬件设计软件、仿真软件或数据分析软件等进行设计开发，从而预测和模拟目标问题的输出结果，并能够理解所用技术或工具的局限性。

6. 工程与社会：能够基于工程相关背景知识进行合理分析，评价生物医学工程实践活动以及所设计的医学仪器或计算机辅助诊断设备等对人体健康、社会伦理、安全、法律以及区域文化可能产生的影响，并理解应承担的责任，配合相关部门制定权益规范。

7. 环境和可持续发展：能够基于环境保护、人文社会等领域的相关背景知识，理解和评价在医学仪器或计算机辅助诊断设备等研发或应用过程中，专业实践活动对环境、社会可持续发展的影响。

8. 职业规范：具有人文社会科学素养、社会责任感，能够在解决生物医学工程领域的复杂工程问题中理解并遵守工程职业道德和规范，履行法定或社会约定的责任。

9. 个人和团队：生物医学工程是高度交叉与融合的专业，在生物学、医学、工程学、

社会学等多学科背景下的团队中，能够承担个体、团队成员以及负责人的角色。

10. 沟通：能够在医学仪器或计算机辅助诊断设备等的设计、开发、调测、应用等过程中，与业界同行及社会公众进行有效沟通和交流，包括撰写技术报告、设计技术文稿、陈述发言、清晰表达或回应指令等；并具备一定的国际视野，能够在跨文化背景下针对产品研发、产品应用或产品推广等进行有效的沟通和交流。

11. 项目管理：理解并掌握工程管理原理与经济决策方法，并在医学仪器或计算机辅助诊断设备的研发或应用过程中加以运用，具有良好的项目组织、协调和管理能力。

12. 终身学习：具有自主学习的意识，能够利用互联网、图书馆等资源，实践自主学习。同时，具备终身学习的意识，不断更新和学习与生物医学工程专业相关的知识，适应时代发展，勇于开拓生物医学工程专业美好的未来，造福人类。

Ⅲ.Skills Profile

The graduates should acquire the following knowledge and abilities:

13. Engineering knowledge. The students should be able to combine the theories and methods of mathematics, natural science, engineering and other fields with the specific problems in biomedical engineering, and apply the knowledge into the complex engineering problems such as research and development or application of medical instruments or computer-aided diagnosis equipments.
14. Problem analysis. According to the properties of specific issues in the field of biomedical engineering, the students should be able to discriminate and express the complex engineering problems to be solved, such as medical signal sensing, detecting, identifing, or processing, and analyze the difficult technical points to obtain the correct principle model or other effective conclusions by means of literature studying, mathematical modeling, engineering reasoning and so on.
15. Design/development of solutions. For the complex engineering problems appearing in the research and development of medical instruments or computer-aided diagnostic equipments, the students should be able to design the system block diagram, hardware circuit diagram, the algorithm flow graph to meet the requirements, and be able to integrate the innovation in the design stage, at the same time to fully consider the possible impact on the social, health, safety, law, cultural and environment etc. for optimizing the overall performance of the system or equipment.
16. Research. For the generality and particularity of problems in signal sensing, detecting, identifing, or processing in biomedical engineering, the students should be able to use mathematical modeling, software and hardware simulation, data analysis, experimental design or other scientific methods to study the scientific principle of target problem, the influence of key parameters, the system stability and reliability and so on. Besides, they should combine the various aspects of research for the target problem to obtain the reasonable and effective research route or conclusion.
17. Modern tool utilization. For the complex engineering problems in biomedical engineering, such as the medical signal sensing, detection, identification or processing, the students should be able to select and use the appropriate sensing components, the related hardware and software design software, simulation software or data analysis software to carry out design and development so that the output can be predicted and simulated. Besides, the students should be able to understand the limitations of the used technologies or tools.
18. Engineering and society. Based on the reasonable analysis of engineering related background knowledge, the students should be able to evaluate the possible influence of biomedical engineering practice and the designed medical instrument or computer-aided diagnosis equipment on human health, social ethics, security, law and regional culture. Besides, they should be able to understand the responsibilities and cooperate with the relevant departments to formulate the righ norms.
19. Environment and sustainable development. Based on the related background knowledge about

environmental protection and human society, the students should be able to understand and evaluate the impact of professional practice activities on environment and social sustainable development in the process of research and application of medical instruments or computer-aided diagnostic equipments.

20. Professional ethics. The students should be able to possess humanistic and social science literacy and social responsibility, understand and abide the engineering ethics and norms when solving the complex engineering problems of biomedical engineering and fulfill responsibilities.
21. Individuals and groups. Biomedical engineering is a highly interdisciplinary and integrated major. Therefore, the students should be able to undertake the roles of individual, team member and responsible person in the team with multidisciplinary background such as biology, medicine, engineering, sociology and so on.
22. Communication. In the processes of designing, development, testing and application of the medical instruments or computer-aided diagnosis equipments, the students should be able to have the effective communication with the industry peers and the public including writing technical reports, designing technical presentations, making a statement, expressing clearly or responsing instructions. Besides, they should have a certain international vision and be able to communicate effectively for the product development, application or promotion in the cross-cultural background.
23. Project management: The students should be able to understand and master the principles of engineering management and the methods of economic decision and apply them into the development or application of medical instruments or computer-aided diagnosis equipments, with good capabilities of project organization, coordination and management.
24. Lifelong learning. The students should possess the consciousness of independent learning, and be able to use the Internet, library and other resources to practice self-study. At the same time, they should have lifelong learning consciousness, constantly update and learn the knowledge related to biomedical engineering, adapt to the development of the times, open up the future of biomedical engineering, and benefit mankind.

四、专业特色

生物医学工程学是综合生物学、医学和工程学的理论与方法而发展起来的交叉性学科。涉及物理学、生物学、医学、电学、计算机等多学科知识，是典型的既具有明显专业特征，又结合其他学科内容的多学科交叉的综合性学科。本专业充分考虑信息工程学院的学科优势和生物医学工程学科的特点，培养学生既具备电子信息科学与技术的基本知识，又掌握生物医学工程学的专业知识与技能。本专业就业口径宽，毕业生可在医学仪器、医疗卫生信息系统、电子信息工程、计算机和通信等领域，从事科研、教学、工程设计与开发、技术管理等工作。

Ⅳ.Specialty Features

BME is an interdisciplinary subject developed by integrating the theory and method of biology, medicine and engineering. BME, including multidisciplinary knowledge, such as physics, biology, medicine, electricity, computer and so on, is a typical comprehensive subject, which has the characteristic of distinct specialty and the content of other subjects. The major takes full advantage of the superiority of information engineering school and considers the characteristics of biomedical engineering subject. The students of this major are trained to master the basic knowledge of electronic information science and technology, and also grasp the professional knowledge and skills of biomedical engineering. BME has a wide employment caliber, the graduates of this major can be engaged in scientific research, engineering design and development, technology management and management in medical equipment, medical and health information systems, electronic information engineering, computer and communication etc.

五、 主干学科、专业核心课程、学位课程

主干学科：生物医学工程、电子科学与技术。

专业核心课程：人体形态学、数字信号处理 A、医学信号处理、医学传感与检测技术、医学成像技术、医学图像处理 A、医学仪器、模式识别基础。

学位课程：综合英语 2、高等数学 A1、 程序设计基础 C（C 语言）、电路分析基础 A1、模拟电子技术、数字电子技术、信号与系统 B、医学信号处理、医学仪器、生物医学工程综合设计。

Ⅴ.Core Disciplines and Courses

Core Disciplines: Biomedical Engineering, Electronics Science and Technology

Core Courses: Human Morphology, Digital Signal Processing A, Medical Signal Processing, Sensor and Measure of Biomedicine, Medical Imaging Technology, Medical Image Processing A, Biomedical Measurements and Instrumentation, Pattern Recognition Foundation.

Degree Course：Integrated English 2, Advanced Mathematics A1, C Language Programming Foundation C, Circuit Analysis Fundamentals A1, Analog Electronic Technology, Digital Electronic Technology, Signals and Systems B, Medical Signal Processing, Biomedical Measurements and Instrumentation, Comprehensive Design of Biomedical Engineering.

六、 学分分配

Ⅵ. Credits of Courses

类别 Type of Course	必修 Required			选修 Elective		集中实践环节 Practice Training	合计(比例) Total(%)
	通识教育 Basic Courses in General Education	学科（大类）教育 Basic Courses in General Discipline	专业教育 Specialty-oriented Courses	通识教育 Basic Courses in General Education	个性化教育 Characteristic Education Courses		
理论学分 Theory Credits	33	27	43	6	6.5	0	68%
实践学分 Practice Credits	9	5	8.5	0	5	27	32%
小计 Subtotal	42	32	51.5	6	11.5	27	170
比例（%） Proportion(%)	24.7%	18.8%	30.3%	3.5%	6.8%	15.9%	100%

七、 专业教学计划

Ⅶ. Table of Teaching Schedule

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
通识教育平台 Basic Courses in General Education	必修 Required	1	XG160010	入学教育 Entrance Education	0.5	8	0	8	0	0	1				考试
		2	BW160010	军事技能训练 Military Skill Training	0.5	32	0	32	0	0	1				考查
		3	MY160360	中国近现代史纲要 Chinese Modern History	2	32	32	0	0	0	1				考试

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		4	MY160041	形势与政策 1 Situation and Policy 1	0.5	8	8	0	0	0	1				考查
		5	WY160371	综合英语 1 Integrated English 1	3	48	48	0	0	0	1				考试
		6	JK160230	大学计算机（理工 A） College Basic Computer（A, for Students of Science and Engineering）	2	32	32	0	0	0	1				考查
		7	JK160380	计算机基本技能训练 Computer Application Skill Training	1	16	0	0	16	0	1				考试
		8	FX160020	大学生心理健康教育 Mental Health Education of College Students	1	16	10	6	0	0	1				考试
		9	自选项目	体育项目 1-4 Sports Items 1-4	4	128		128			1-4				考试
		10	GF160930	军事理论 Military Theory	0.5	36	16	0	0	20	2				考试
		11	MY160210	思想道德修养与法律基础 Thought Morals Tutelage and Legal Foundation	3	48	48	0	0	0	2				考试
		12	MY160042	形势与政策 2 Situation and Policy 2	0.5	8	8	0	0	0	2				考查
		13	WY160372	综合英语 2 Integrated English 2	3	48	48	0	0	0	2	★			考试
		14	MY160280	思想政治理论课实践教学 The Practice Teaching of Ideological and Political Theory	2	32	0	32	0	0	3				考查
		15	MY160080	马克思主义基本原理概论 Introduction to The Basic Principles of Marxism	3	48	48	0	0	0	3				考试
		16	MY160033	形势与政策 3 Situation and Policy 3	0.5	8	8	0	0	0	3				考查
		17	WY160203	综合英语 3 Integrated English 3	2	32	32	0	0	0	3				考试
		18	JW160020	就业创业基础 Employment and Entrepreneurship Foundation	2.5	40	40	0	0	0	6				考查
		19	JG161360	经济管理概论 Generality of Economics and Management	2	32	32	0	0	0	3				考试
		20	MY160024	形势与政策 4 Situation and Policy 4	0.5	8	8	0	0	0	4				考查
		21	WY160104	综合英语 4 Integrated English 4	2	32	32	0	0	0	4				考试
		22	JW160010	创新思维与方法 Innovative Thinking and Methods	1	16	16	0	0	0	4				考试
		23	MY160110	毛泽东思想与中国特色社会主义理论体系概论 An Introduction to Mao Zedong Thought and The Theoretical System of Socialism With Chinese Characteristics	4	64	64	0	0	0	4				考试
		24	TY160031	体能训练及体质达标测试 1 Physical Training& Physical	0.5	8	0	8	0	0	5				考试

课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
					Fitness Test 1											
			25	TY160032	体能训练及体质达标测试 2 Physical Training& Physical Fitness Test 2	0.5	8	0	8	0	0	6				考试
	小计 Subtotal					42	788	530	222	16	20					
	选修 Elective		选修全校通识选修课 6 学分									2-8				
	小计 Subtotal					6	96	96	0	0	0					
合计 Total						48	884	626	222	16	20					
学科（大类）教育平台 Basic Courses in General Discipline	必修 Required		1	XX161520	程序设计基础 C（C 语言） C Language Programming Foundation C	3	48	32	0	16	0	1	★			考试
			2	LX160071	高等数学 A1 Advanced Mathematics A1	6	96	96	0	0	0	1	★			考试
			3	LX160840	线性代数 A Linear Algebra A	3	48	48	0	0	0	1				考试
			4	LX160072	高等数学 A2 Advanced Mathematics A2	6	96	96	0	0	0	2				考试
			5	LX160210	复变函数与积分变换 Functions of Complex Variable and Integral Transforms	2	32	32	0	0	0	2				考试
			6	LX161390	大学物理 E University Physics E	5	80	80	0	0	0	2				考试
			7	LX160230	概率论与数理统计 B Probability and Mathematical Statistics B	3	48	48	0	0	0	3				考试
			8	GC160040	工程训练 D Engineering Training D	2	32	0	32	0	0	3				考查
			9	LX160051	大学物理实验 C1 University Physics Experiment C1	1	16	0	0	16	0	3				考查
			10	LX160052	大学物理实验 C2 University Physics Experiment C2	1	16	0	0	16	0	4				考查
合计 Total						32	512	432	32	48	0					
专业教育平台 Specialty-oriented Courses	必修 Required	专业基础课程 specialized basic courses	1	XX160031	电路分析基础 A1 Circuit Analysis Fundamentals A1	2	32	32	0	0	0	2	★	◆		考试
			2	XX160041	电路分析基础实验 A1 Experiments of Circuit Analysis Fundamentals A1	0.5	8	0	0	8	0	2				考查
			3	XX161700	软件技术基础 A Software Technology Foundation A	2.5	40	32	0	8	0	2				考试
			4	XX160032	电路分析基础 A2 Circuit Analysis Fundamentals A2	2	32	32	0	0	0	3		◆		考试
			5	XX160042	电路分析基础实验 A2 Experiments of Circuit Analysis Fundamentals A2	0.5	8	0	0	8	0	3				考查
			6	XX160700	模拟电子技术 Analog Electronic Technology	3.5	56	56	0	0	0	3	★	◆		考试

课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
			7	XX160710	模拟电子技术实验 Experiments of Analog Electronic Technology	1	16	0	0	16	0	3				考查
			8	XX161640	计算机网络 E Computer Network E	4	64	48	0	16	0	3				考试
			9	XX160880	数字电子技术 Digital Electronic Technology	3.5	56	56	0	0	0	4	★	◆		考试
			10	XX161740	数字电子技术实验 A Experiments of Digital Electronic Technology A	1	16	0	0	16	0	4				考查
			11	XX161170	信号与系统 B Signals and Systems B	4	64	64	0	0	0	4	★	◆		考试
			12	XX160610	计算机原理及应用 Computer Principles and Applications	3	48	48	0	0	0	5		◆		考试
			13	XX160620	计算机原理及应用实验 Experiments of Computer Principles and applications	0.5	8	0	0	8	0	5				考查
		专业核心课程 specialized core courses	1	XX161690	人体形态学 Human morphology	2.5	40	40	0	0	0	4				考试
			2	XX161760	数字信号处理 A Digital Signal Processing A	3	48	40	0	8	0	5		◆		考试
			3	XX161220	医学传感与检测技术 Sensor and Measure of Biomedicine	3	48	40	0	8	0	5		◆		考试
			4	XX161230	医学信号处理 Medical Signal Processing	3	48	40	0	8	0	6	★	◆		考试
			5	XX161240	医学仪器 Biomedical Measurements and Instrumentation	3	48	48	0	0	0	6	★	◆		考试
			6	XX161900	医学成像技术 Medical Imaging Technology	2	32	24	8	0	0	6		◆		考试
			7	XX161910	医学图像处理 A Medical Image Processing A	3.5	56	40	8	8	0	6				考试
			8	XX161680	模式识别基础 Pattern Recognition Foundation	3.5	56	32	24	0	0	7				考试
		集中实践环节 Practice raining	1	XX160810	生物医学工程专业认识实习 Cognitive Practice of Biomedical Engineering	1	16	0	16	0	0	2				考查
			2	XX160400	电子技术课程设计 Course Design of Electronic Technology	2	32	0	32	0	0	4				考查
			3	XX160770	软件技术课程设计 Course Design of Software Technology	2	32	0	32	0	0	5				考查

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		4	XX160820	生物医学工程专业生产实习 Production Practice of Biomedical Engineering	2	32	0	32	0	0	4				考查
		5	XX160840	生物医学信号采集与处理课程设计 Course Design of Biomedical Signal Acquisition and Processing	2	32	0	32	0	0	5				考查
		6	XX160830	生物医学工程专业综合设计 Comprehensive Design of Biomedical Engineering	3	48	0	48	0	0	6	★			考查
		7	XX160800	生物医学工程专业毕业实习 Graduation Practice of Biomedical Engineering	3	48	0	48	0	0	8				考查
		8	XX160790	生物医学工程专业毕业设计 Graduation Design of Biomedical Engineering	12	192	0	192	0	0	8				考查
合计 Total					78.5	1256	688	456	112	0					
个性化教育平台 Characteristic Education Courses	选修 Elective	本专业/跨专业选修课程共计 8.5 学分。1-8 学期开设。 1. 学生可根据自身发展方向修读本专业或跨专业个性化平台选修课。 2. 个性化平台选修课详见《西南科技大学个性化平台选修课程选课指导与修读手册》。													
	创新创业实践必修 Required	创新创业实践系列项目（学术报告/科研项目/创新创业项目/科技竞赛等）共 3 学分。1-8 学期开设。 Serial Program on Innovation and entrepreneurship practice (academic presentation/research project/innovation and entrepreneur program/ Scientific and technical contest, etc.), in total 3 credits.													
合计 Total					11.5	184	104	32	48	0					
共计 Total					170	2836	1858	726	224	20					

注：1，标注★的为“学位课程”，标注◆的为“辅修课程”，标注▲的为“双学位课程”；标注△的为双语课程，标注☆的为全英文教学课程。

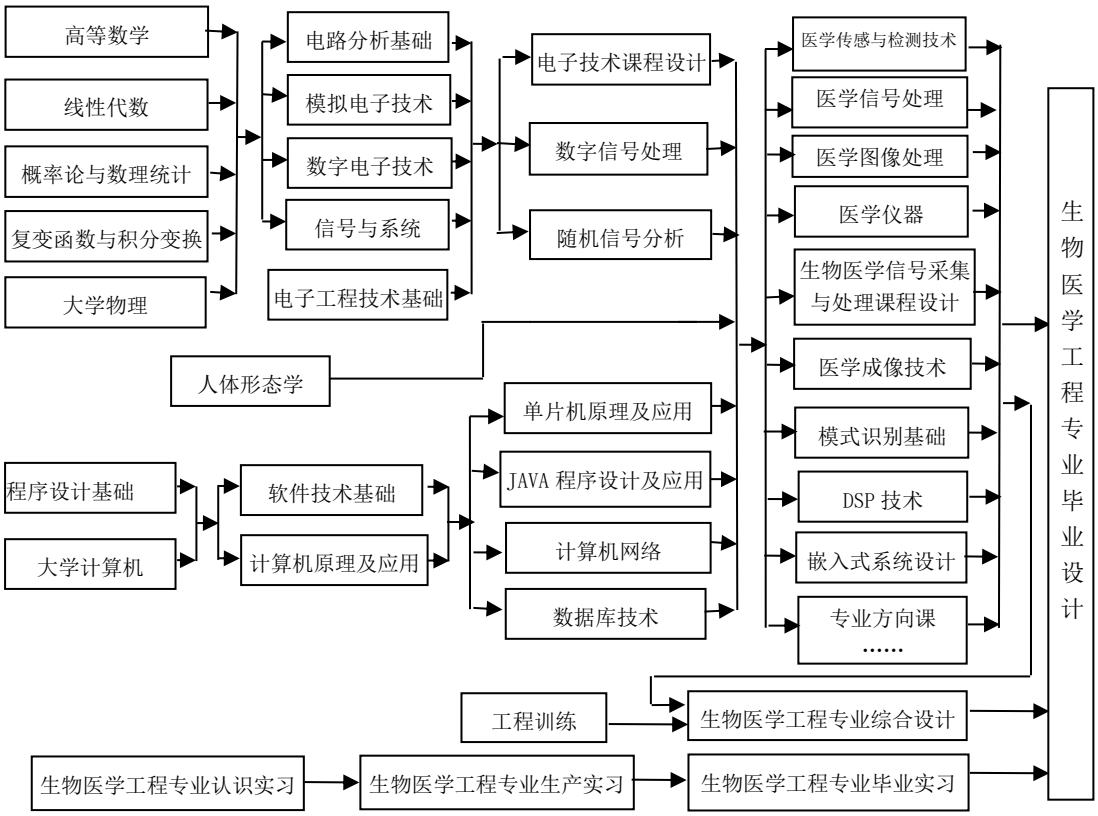
2．课程考核方式分为考试和考查。

Remarks:

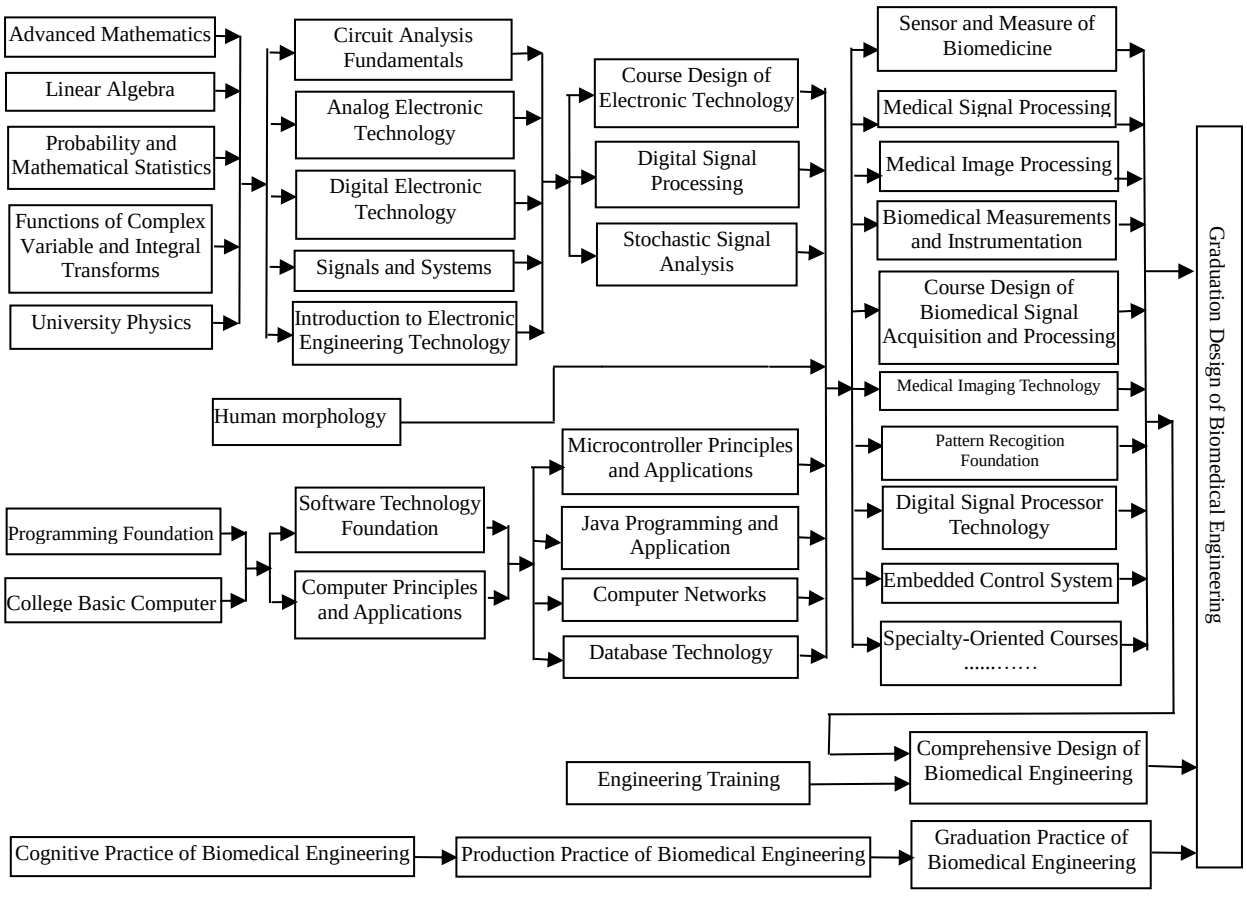
1.★stands for “degree course”, ◆ stands for “minor course”, ▲ stands for “bi-language course”, △ stands for the course is in bi-language，☆stands for the course is all in English.

2.“Examination on Mode” includes “examination” or “check”.

八、 选课指导（课程配置流程图）



Ⅷ.Guidance for Selecting Courses



九、各学期应修学分分布表

Ⅸ. Credit's Table for each Semester

学期 Semester	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th	学分合计 Total
建议应修学分 Credits	25.5	27	27.5	26.5	20	19	9.5	15	170

十、说明

选修课的修学计划须在班主任和专业导师指导下完成。

Ⅹ.Instructions

Elective course plan must be formulated under the directions from class adviser and professional supervisor.

通信工程专业培养方案
Undergraduate Program for Specialty in Communication Engineering

专业负责人：秦明伟　　主管院长：姚远程　　院学术委员会主任：邹传云

Director of Specialty: Mingwei Qin
Executive Dean: Yuancheng Yao
Academic Committee Director: Chuanyun Zou

一、修业年限及授予学位名称

学制 4 年，最低毕业学分 173，允许学习年限为 3-6 年，授予工学学士学位。

Ⅰ. Length of Schooling and Degree Conferred

Length of Schooling: 4 years.

Credits: ≥173.

Duration: 3-6 years.

Degrees Conferred: Bachelor of Engineering.

二、培养目标

面向通信系统中各装置/单元的工程设计与开发，培养具有软件或硬件设计、制作、调试、性能测试与初步分析的能力，能在嵌入式系统、智能终端、数字通信等应用领域具有专业特长的应用型高级工程技术人才。

本专业毕业生在毕业五年左右的预期目标：

1）具有应用数学、物理学等自然科学基础和工程技术基础、一定的人文和社会科学基础以及基本的经济与管理知识的能力；

2）具有应用通信学科的基本理论和工程专业知识的能力；具有成体系的工程实践阅历，并了解本专业的发展现状和趋势；

3）具备运用现代工具进行通信装置或单元的设计、制作、调试、性能测试与初步分析能力；

4）掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，具有一定的创新意识；

5）具有团队意识、表达能力、人际交往能力和良好的职业道德与人文素养，能在团队中承担相应角色；

6）具有终身学习的意识，能够在工作中持续学习，实现工作能力的自我提升；

7）具有良好的社会道德与法律意识、理解工程对环境与可持续发展的影响。

Ⅱ. Educational Objectives

Looking into the engineering design and development of the communication equipment or

unit, the talents who can design, make, debug, test and preliminarily analyze in the hardware or software can be cultivated, and so can the application-oriented senior engineering technical personnel in embedded system, smart terminal, digital communication and so on.

The expected goals of the graduates for about five years:

1) They will have the solid math and physics foundation of natural science, engineering technology, have a certain foundation of humanity and social science, and have the basic knowledge of economy and management.

2) They will have the basic theory and engineering knowledge of communications, have the systematic engineering experiences and know the current situation and trend of the major.

3) They will have the ability to design, make, debug, test and preliminarily analyze the communication equipment or unit with modern tools.

4) They will master the basic methods of document retrieval, data inquiry, and use modern information technology to obtain relevant information. They will also have certain innovation consciousness.

5) They will have team spirit, expressing ability, interpersonal skill, good professional ethics and humanistic quality. They can also take responsibility in a team.

6) They will have the lifelong study consciousness. They can keep learning in the work and achieve self-improvement in working ability.

7) They will have good social morality and legal consciousness, and understand the impact of engineering on environment and sustainable development.

三、培养规格及要求

学生应德智体全面提高，知识、能力、素质协调发展。具有扎实的数学、自然科学、人文社会科学和工程技术基础理论，宽厚的通信工程专业知识和实践能力，具有对通信装置/单元的分析、设计、制作、调试和性能测试的基本能力。为此，毕业生需具有以下知识、能力和素质：

1）工程知识：具有从事通信工程所需的数学、自然科学、工程基础和专业知识，能够应用数学、自然科学等领域的理论与方法，以及工程基础和通信工程等相关领域的专业知识与技能，解决通信装置/单元设计、制作、调测及应用过程中所面临的复杂工程问题。

2）问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达并过文献研究，分析通信装置/单元中存在的复杂工程问题，以获得有效结论。

3）设计/开发解决方案：能够针对通信装置/单元设计中面临的复杂工程问题，提供合理的解决方案，设计满足特定用户需求与技术指标的通信装置、核心单元及工艺流程，设计中具备一定的创新意识，并考虑社会、健康、安全、法律、文化以及环境等因素。

4）研究：能够基于相关科学原理并采用科学方法，对通信工程中的模块/单元问题进行研究，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。

5）使用现代工具：能够针对通信装置/单元的设计、开发、调测及应用全过程中所面临的复杂工程问题，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，包括对问题的预测与模拟，并能够理解其局限性。

6）工程与社会：能够基于相关背景知识进行合理分析，评价具体的工程实践和解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

7）环境和可持续发展：能够理解和评价具体的通信工程实践对环境、社会可持续发展的影响。

8）职业规范：具有人文社会科学素养、社会责任感，能够在通信工程实践中理解并遵守工程职业道德和规范，履行责任。

9）个人和团队：具有团队协作意识，能够在多学科背景下的团队中承担相应角色。

10）沟通：能够就通信装置/单元中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、陈述发言和清晰对话；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。

11）项目管理：理解并掌握通信工程管理原理与经济决策方法，并能在多学科环境中应用。

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。

Ⅲ. Skills Profile

Students should improve in the moral, intellectual and physical. Their knowledge, ability and high quality should get coordinated development. They should have the solid foundation of math, natural science, humanity and social science, and engineering technology theories. They should have broad communication engineering knowledge and practical ability, have the basic ability to analyze, design, make, debug and test the communication equipment or unit. So the graduates should have the following knowledge, ability and quality.

1) Engineering Knowledge

The graduates should have the knowledge of math, natural science, and engineering which is needed by communication engineering. They can also use the theory and methods in applied mathematics, natural science and so on, use the professional knowledge and skills in engineering foundation, communication engineering and some other related areas to solve the complicated engineering problems in the designing, making, debugging and applying of the communication equipment or unit.

2) Problem Analysis

The graduates can apply the basic principles of applied mathematics, natural science and

engineering science to study the literature, analyze the complicated engineering problems in communication equipment or unit, and obtain the effective conclusion.

3) Design/Develop Solutions

According to the complicated engineering problems in the communication unit design, the graduates can provide the reasonable solutions and design the communicators, core unit and technical process to satisfy the specific users and specifications. There will be some certain innovation consciousness in the design. Besides, the society, health, security, law, culture, environment and other factors should be considered.

4) Study

The graduates can study the communication modules or unit problems based on the relevant scientific principles and methods, including designing the experiments, analyzing and explaining data, and obtaining the reasonable and effective conclusion through the information.

5) Apply Modern Tools

According to the complicated engineering problems in the design, developing, debugging and applying of the communication equipment or unit, the graduates can develop, choose and use the proper technology, resource, modern engineering tools and information technology tools, including predicting and sampling questions, and also can understand the limitations.

6) Engineering and Society

Based on the relevant background knowledge, the graduates can evaluate influences of specific engineering practices and solutions on the society, health, security, law and culture, and understand the responsibility.

7) Environment and Sustainable Development

The graduates can understand and evaluate influences of specific engineering practice on the environment and sustainable development.

8) Professional Norms

The graduates should have the humanistic quality and social responsibility, understand and comply with the professional ethics and norms in the practice of communication engineering, taking responsibility.

9) Individual and Team

The graduates should have team cooperation consciousness, and play the roles in a multi-disciplinary team.

10) Communication

The graduates can communicate with industry peers and the public effectively on the complicated engineering problems of the communication equipment or unit, including writing

reports, designing presentations and speaking clearly. They also should have a certain international vision, and can communicate under the cross cultural background.

11) Project Management

The graduates can understand and master the principles of communication engineering management and economic decision-making methods, and apply them in the multi-disciplinary situations.

12) Lifelong Learning

The graduates should have the consciousness of self-learning and lifelong learning. They should have the ability to learn constantly and adapt the development.

四、专业特色

注重专业基础知识与专业技能的培养和综合素质的提高，以现代通信理论为基础，面向通信装置/单元的设计、制作、调试与性能测试、应用等环节，研究信号的产生、传输、交换与处理，以及相关装置/单元在网络通信、数据传输或无线通信等方面应用中存在的理论和工程应用问题。

Ⅳ. Specialty Features

Pay attention to the cultivation of professional basic knowledge and professional skills and the comprehensive quality improvement. Based on the modern communication theory, looking into the links of designing, making, debugging, testing performance, applying and so on in the communication equipment or unit, the generation, transmission, exchange and processing of signals will be studied. Besides, the theoretical and engineering application problems of relevant equipment or unit in network communication, data transmission, wireless communication and so on will be studied too.

五、主干学科、专业核心课程、学位课程

主干学科：信息与通信工程、计算机科学与技术

专业核心课程：通信电路、现代通信原理 A、数字信号处理 A、计算机网络 E、信号与系统 B、Matlab 通信建模与仿真、系统应用软件技术（Java/C++方向二选一）、系统处理器技术（FPGA/ARM 方向二选一）、通信工程专业导论。

学位课程：综合英语 4、高等数学 A2、电路分析基础 A1、软件技术基础 A、计算机原理及应用、计算机网络 E、通信电路、现代通信原理 A、信号与系统 B、通信工程专业项目实训。

Ⅴ. Core Disciplines and Courses

Core Disciplines: Information and Communication Engineering, Computer science and

technology.

Core Courses: Communication Circuit, Modern Communication Principles A, Digital Signal Processing A, Computer Network E, Signals and Systems B, Modeling and Simulation of Communication Used Matlab, System Application Software Technology (Java/C++ the alternative), System Processor Technology (FPGA / ARM the alternative), Professional Introduction of Communication Engineering.

Degree Course： Integrated English 4, Advanced Mathematics A2, Circuit Analysis Fundamentals A1, Software Technology Foundation A, Computer Network E, Communication Circuit, Computer Principles and Applications, Modern Communication Principles, A Signals and Systems B, Project Training of Communication Engineering.

六、学分分配

Ⅵ. Credits of Courses

类别 Type of Course	必修 Required			选修 Elective		集中实践环节 Practice Training	合计(比例) Total(%)
	通识教育 Basic Courses in General Education	学科（大类）教育 Basic Courses in General Discipline	专业教育 Specialty-oriented Courses	通识教育 Basic Courses in General Education	个性化教育 Characteristic Education Courses		
理论学分 Theory Credits	34	27	41.5	6	9	0	67.92%
实践学分 Practice Credits	8	5	12.5	0	3	27	32.08%
小计 Subtotal	42	32	54	6	12	27	
比例（%） Proportion(%)	24.28%	18.50%	31.21%	3.47%	6.94%	15.61%	100%

七、专业教学计划

Ⅶ.Table of Teaching Schedule

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
通识教育平台 Basic Courses in General Education	必修 Required	1	XG160010	入学教育 Entrance Education	0.5	8	0	8	0	0	1				考试
		2	GF160930	军事理论 Military Theory	0.5	36	16	0	0	20	2				考试
		3	BW160010	军事技能训练 Military Skill Training	0.5	32	0	32	0	0	1				考查
			自选项目	体育项目 1-4 Sports Items 1-4	4	128	0	128	0	0	1-4				考试
		4	TY160031	体能训练及体质达标测试 1 Physical Training and Physical Fitness Test 1	0.5	8	0	8	0	0	5				考试

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		5	TY160032	体能训练及体质达标测试 2 Physical Training and Physical Fitness Test 2	0.5	8	0	8	0	0	6				考试
		6	MY160210	思想道德修养与法律基础 Thought Morals Tutelage and Legal Foundation	3	48	48	0	0	0	2				考试
		7	MY160360	中国近现代史纲要 Chinese Modern History	2	32	32	0	0	0	1				考试
		8	MY160080	马克思主义基本原理概论 Introduction to the Basic Principles of Marxism	3	48	48	0	0	0	3				考试
		9	MY160110	毛泽东思想与中国特色社会主义理论体系概论 An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	4	64	64	0	0	0	4				考试
		10	MY160041	形势与政策 1 Situation and Policy 1	0.5	8	8	0	0	0	1				考查
		11	MY160042	形势与政策 2 Situation and Policy2	0.5	8	8	0	0	0	2				考查
		12	MY160033	形势与政策 3 Situation and Policy3	0.5	8	8	0	0	0	3				考查
		13	MY160024	形势与政策 4 Situation and Policy 4	0.5	8	8	0	0	0	4				考查
		14	MY160280	思想政治理论课实践教学 The Practice Teaching of Ideological and Political Theory	2	32	0	32	0	0	3				考试
		15	WY160371	综合英语 1 Integrated English 1	3	48	48	0	0	0	1				考试
		16	WY160372	综合英语 2 Integrated English 2	3	48	48	0	0	0	2				考试
		17	WY160203	综合英语 3 Integrated English 3	2	32	32	0	0	0	3				考试
		18	WY160104	综合英语 4 Integrated English 4	2	32	32	0	0	0	4	★			考试
		19	JK160230	大学计算机（理工 A） College Basic Computer（A, for Students of Science and Engineering）	2	32	32	0	0	0	1				考试
		20	JK160380	计算机基本技能训练 Computer Application Skill Training	1	16	0	0	16	0	1				考试
		21	FX160020	大学生心理健康教育 Mental Health Education of College Students	1	16	10	6	0	0	1				考试
		22	JW160020	就业创业基础 Employment and Entrepreneurship Foundation	2.5	40	40	0	0	0	6				考试
		23	JW160010	创新思维与方法 Innovative Thinking and Methods	1	16	16	0	0	0	4				考试
		24	JG161360	经济管理概论 Generality of Economics and Management	2	32	32	0	0	0	5				考试
	小计 Subtotal				42	788	530	222	16	20					

课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
	选修 Elective		选修全校通识选修课 6 学分									5-8				
	小计 Subtotal					6										
合计 Total						48										
学科（大类）教育平台 Basic Courses in General Discipline	必修 Required		1	LX160071	高等数学 A1 Advanced Mathematics A1	6	96	96	0	0	0	1				考试
			2	LX160072	高等数学 A2 Advanced Mathematics A2	6	96	96	0	0	0	2	★			考试
			3	LX160230	概率论与数理统计 B Probability and Mathematical Statistics B	3	48	48	0	0	0	3				考试
			4	LX160840	线性代数 A Linear Algebra A	3	48	48	0	0	0	1				考试
			5	LX161390	大学物理 E University Physics E	5	80	80	0	0	0	2				考试
			6	LX160051	大学物理实验 C1 University Physics Experiment C1	1	16	0	0	16	0	3				考查
			7	LX160052	大学物理实验 C2 University Physics Experiment C2	1	16	0	0	16	0	4				考查
			8	GC160040	工程训练 D Engineering Training D	2	32	0	32	0	0	2				考查
			9	LX160210	复变函数与积分变换 Functions of Complex Variable and Integral Transforms	2	32	32	0	0	0	3				考试
			10	XX161520	程序设计基础 C（C 语言） C Language Programming Foundation C	3	48	32	0	16	0	1				考试
合计 Total						32	512	432	32	48	0					
专业教育平台 Specialty-oriented Courses	必修 Required	专业基础课程 specialized basic courses	1	XX160031	电路分析基础 A1 Circuit Analysis Fundamentals A1	2	32	32	0	0	0	2	★	◆		考试
			2	XX160041	电路分析基础实验 A1 Experiments of Circuit Analysis Fundamentals A1	0.5	8	0	0	8	0	2				考查

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		3	XX160032	电路分析基础 A2 Circuit Analysis Fundamentals A2	2	32	32	0	0	0	3		◆		考试
		4	XX160880	数字电子技术 Digital Electronic Technology	3.5	56	56	0	0	0	2		◆		考试
		5	XX161740	数字电子技术实验 A Experiments of Digital Electronic Technology A	1	16	0	0	16	0	2				考查
		6	XX160700	模拟电子技术 Analog Electronic Technology	3.5	56	56	0	0	0	3		◆		考试
		7	XX160710	模拟电子技术实验 Experiments of Analog Electronic Technology	1	16	0	0	16	0	3				考查
		8	XX161700	软件技术基础 A Software Technology Foundation A	2.5	40	32	0	8	0	3	★	◆		考试
		9	XX160610	计算机原理及应用 Computer Principles and Applications	3	48	48	0	0	0	3	★	◆		考试
		10	XX160620	计算机原理及应用实验 Experiments of Computer Principles and Applications	0.5	8	0	0	8	0	3				考查
		11	XX160140	电磁场与电磁波 A Electromagnetic Field and Electromagnetic Wave A	2.5	40	40	0	0	0	5				考试
		12	XX160150	电磁场与电磁波实验 A Experiments of Electromagnetic Field and Electromagnetic Wave A	0.5	8	0	0	8	0	5				考查
		13	XX161540	单片机应用技术 Application Technology of Microcomputer	3	48	32	0	16	0	4				考查
			小计		25.5	408	328	0	80	0					
	专业核心课程 specialized core courses	1	XX161770	通信电路 Communication Circuit	3	48	48	0	0	0	5	★	◆		考试
		2	XX161790	通信电路实验 Experiments of Communication Circuit	1	16	0	0	16	0	5				考查

课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
			3	XX161760	数字信号处理 A Digital Signal Processing A	3	48	40	0	8	0	5				考试
			4	XX161880	现代通信原理 A Modern Communication Principles A	4	64	64	0	0	0	6	★	◆		考试
			5	XX161140	现代通信原理实验 Experiments of Modern Communication Principles	1	16	0	0	16	0	6				考查
			6	XX161490	Matlab 通信建模与仿真 Modeling and Simulation of Communication Used Matlab	2	32	16	0	16	0	6		◆		考查
			7	XX161640	计算机网络 E Computer Network E	4	64	48	0	16	0	4	★	◆		考试
			8	XX161170	信号与系统 B Signals and Systems B	4	64	64	0	0	0	4	★	◆		考试
			9	XX161860	系统应用软件技术（Java/C++方向二选一） Application Software Technology of System (Java/C++ the Alternative)	3	48	24	0	24	0	4				考查
			10	XX161850	系统处理器技术（FPGA/ARM 方向二选一） Processor Technology of System (FPGA / ARM the Alternative)	3	48	24	0	24	0	5				考查
			11	XX161800	通信工程专业导论 Professional Introduction of Communication Engineering	0.5	8	8	0	0	0	1		◆		考查
		小计				28.5	456	336	0	120	0					
		集中实践环节 Practice raining	1	XX160970	通信工程专业认识实习 Cognition Practice of Communication Engineering	1	16	0	16	0	0	1				考查
			2	XX160400	电子技术课程设计 Course Design of Electronic Technology	2	32	0	32	0	0	4				考查
			3	XX160770	软件技术课程设计 Course Design of Software	2	32	0	32	0	0	5				考查

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
				Technology											
		4	XX161820	通信技术课程设计 Course Design of Communication Technology	2	32	0	32	0	0	6				考查
		5	XX161810	通信工程专业项目实训 Project training of Communication Engineering	3	48	0	48	0	0	7	★			考查
		6	XX160980	通信工程专业生产实习 Production Practice of Communication Engineering	2	32	0	32	0	0	7				考查
		7	XX160950	通信工程专业毕业设计 Graduation Design of Communication Engineering	12	192	0	192	0	0	8				考查
		8	XX160960	通信工程专业毕业实习 Graduation Practice of Communication Engineering	3	48	0	48	0	0	8				考查
		小计			27	432	0	432	0	0					
合计 Total					81										
个性化教育平台 Characteristic Education Courses	选修 Elective	设置专业限选课共计 15 学分，学生需完成本专业/跨专业选修课程共计 9 学分，5-7 学期开设。 1. 学生可根据自身发展方向修读本专业或跨专业个性化平台选修课。 2. 个性化平台选修课详见《西南科技大学个性化平台选修课程选课指导与修读手册》。													
	必修 Required	创新创业实践系列项目（学术报告/科研项目/创新创业项目/科技竞赛等）共 3 学分。1-8 学期开设。 Serial Program on Innovation and entrepreneurship practice (academic presentation/research project/innovation and entrepreneur program/ Scientific and technical contest, etc.), in total 3 credits													
合计 Total					12										
共计 Total					173										

注：1. 标注★的为“学位课程”,标注◆的为“辅修课程”，标注▲的为“双学位课程”；标注△的为双语课程，标注☆的为全英文教学课程。

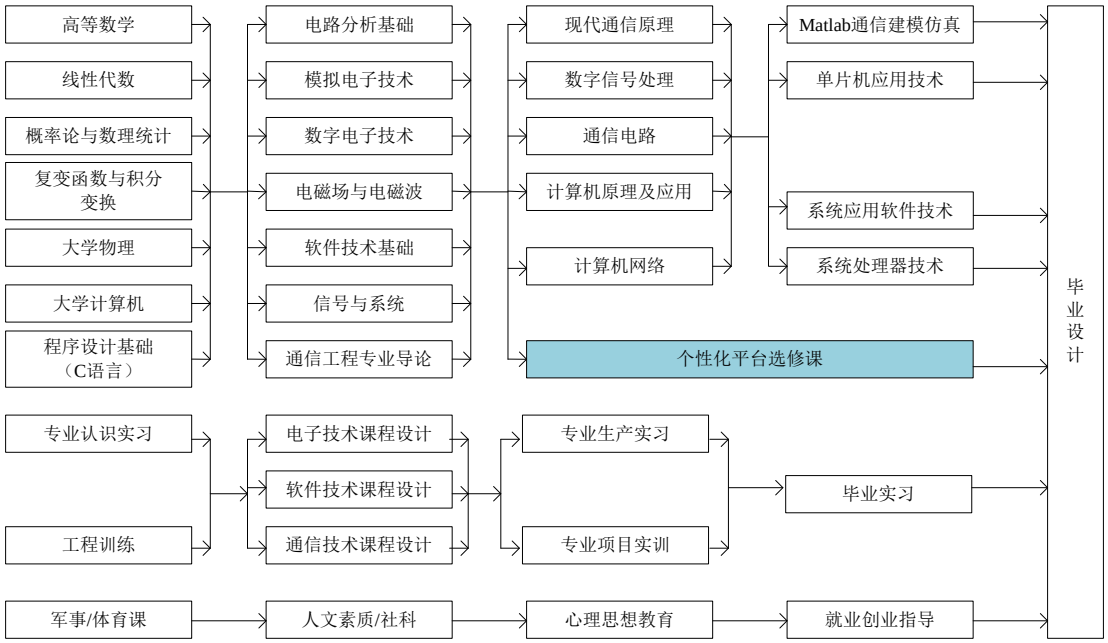
2．课程考核方式分为考试和考查。

Remarks:

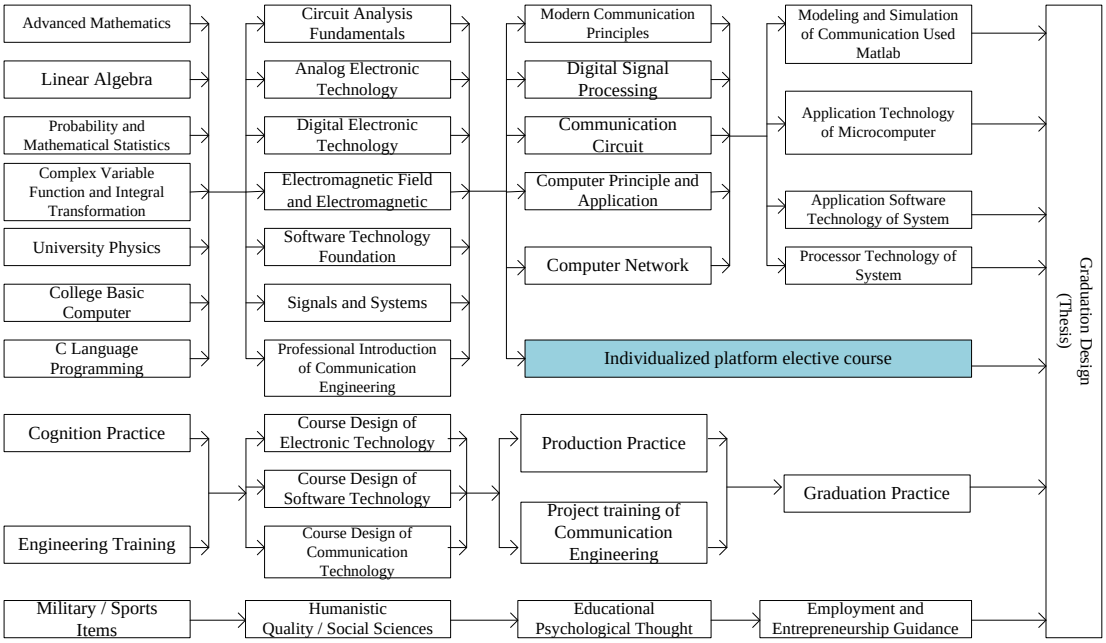
1.★stands for “degree course”, ◆ stands for “minor course”, ▲ stands for “bi-language course”, △ stands for the course is in bi-language，☆stands for the course is all in English.

2.“Examination on Mode” includes “examination” or “check”.

八、课程配置流程图


高等数学
线性代数
概率论与数理统计
复变函数与积分变换
大学物理
大学计算机
程序设计基础（C语言）
电路分析基础
模拟电子技术
数字电子技术
电磁场与电磁波
软件技术基础
信号与系统
通信工程专业导论
现代通信原理
数字信号处理
通信电路
计算机原理及应用
计算机网络
个性化平台选修课
Matlab通信建模仿真
单片机应用技术
系统应用软件技术
系统处理器技术
毕业设计
专业认识实习
工程训练
电子技术课程设计
软件技术课程设计
通信技术课程设计
专业生产实习
专业项目实训
毕业实习
军事/体育课
人文素质/社科
心理思想教育
就业创业指导

Ⅷ. Guidance for the Courses Configuration



九、各学期应修学分分布表

Ⅸ.Credit's Table for each Semester

学期 Semester	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th	学分合计 Total
必修学分 Compulsory Credits	24	27	26	24.5	17.5	12	5	15	151
	4（体育）								13
					6（通识选修）				
	3（创新创业实践）								
建议专业限选学分 Optional Credits					2	2	5		≥9
合计 Totals									173

十、说明

选修课的修学计划须在班主任和专业导师指导下完成。

Ⅹ.Instructions

The plan for elective courses should be implemented under the guidance of a head teacher or a mentor.

物联网工程专业培养方案
Undergraduate Program for Specialty in Internet of Things Engineering

专业负责人：路锦正　　主管院长：姚远程　　院学术委员会主任：邹传云

Director of Specialty: Jinzheng　Lu
Executive Dean: Yuancheng Yao
Academic Committee Director: Chuanyun Zou

一、修业年限及授予学位名称

学制 4 年，最低毕业学分 173，允许学习年限为 3-6 年，授予工学学士学位。

Ⅰ.Length of Schooling and Degree:

Length of Schooling: 4 years.

Credits: ≥173.

Duration: 3-6 years.

Degrees Conferred: Bachelor of Engineering.

二、培养目标

面向物联网系统中装置/单元的工程设计与开发，培养兼具软硬件设计、制作、调试、测试、初步分析与表达能力，能在物联网感知与控制、通信与组网、数据处理、软件与服务等应用领域具有专业特长的应用型高级工程技术人才。

本专业毕业生在毕业五年左右的预期目标：

1、具有应用数学、物理学等自然科学基础和工程技术基础、一定的人文和社会科学基础以及基本的经济与管理知识的能力；

2、具有应用物联网学科基本理论和工程专业知识的能力；具有成体系的工程实践经历，并了解本专业的发展现状和趋势；

3、具备运用现代工具进行物联网装置或单元的设计、制作、调试、测试与初步分析能力；

4、掌握文献检索、资料查询及运用现代信息技术获取相关信息的基本方法，具有一定的创新意识；

5、具有团队意识、表达能力、人际交往能力和良好的职业道德、人文素养，能在团队中承担相应角色；

6、具有终身学习的意识，能够在工作中持续学习，实现工作能力的自我提升；

7、具有良好的社会道德与法律意识、理解工程对环境与可持续发展的影响。

Ⅱ.Educational Objectives

Looking into the engineering design and development of the Internet of Things (IoT) systems equipment or units, the talents who can design, make, debug, test, and preliminarily analyze in the hardware or software can be cultivated. And they can be the professional talents in the IoT control and perception technology, communication and networking, data processing, software and service and so on.

The expected goals of the graduates for about five years:

1. They will have the solid math and physics foundation of natural science, engineering technology, have a certain foundation of humanity and social science, and have the basic knowledge of economy and management.

2. They will have the basic theory and engineering knowledge of Internet of Things engineering, have the systematic engineering experiences and know the current situation and trend of the major.

3. They will have the ability to design, make, debug, test performance and preliminarily analyze the Internet of Things equipment or units with modern tools.

4. They will master the basic methods of document retrieval, data inquiry, and using modern information technology to obtain relevant information. They will also have certain innovation consciousness.

5. They will have team spirit, expressing ability, interpersonal skill, good professional ethics and humanistic quality. They can also take responsibility in a team.

6. They will have the lifelong study consciousness. They can keep learning in the work and achieve self-improvement in working ability.

7. They will have good social morality and legal consciousness, and understand the impact of engineering on environment and sustainable development.

三、培养规格及要求

学生应德智体全面提高，知识、能力、素质协调发展。具有扎实的数学、自然科学、人文社会科学和工程技术基础理论，系统宽厚的物联网工程专业知识和实践能力，具有从事物联网装置/单元的分析、设计、制作、调试和性能测试的基本能力。为此，毕业生需具有以下知识、能力和素质：

1. 工程知识：具有从事物联网工程所需的数学、自然科学、工程基础和专业知识，能够应用数学、自然科学等领域的理论与方法，以及工程基础和物联网工程等相关领域的专业知识与技能，解决物联网装置/单元设计、制作、调测及应用过程中所面临的复杂工程问题。

2. 问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达并过文献研究，分析物联网装置/单元中存在的复杂工程问题，以获得有效结论。

3. 设计/开发解决方案：够针对物联网装置/单元设计中面临的复杂工程问题，提供合理的解决方案，设计满足特定用户需求与技术指标的物联网装置、核心单元及工艺流程，设计中具备一定的创新意识，并考虑社会、健康、安全、法律、文化以及环境等因素。

4. 研究：能够基于相关科学原理并采用科学方法，对物联网工程中的模块/单元问题进行研究，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。

5. 使用现代工具：能够针对物联网装置/单元的设计、开发、调测及应用全过程中所面临的复杂工程问题，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，包括对问题的预测与模拟，并能够理解其局限性。

6. 工程与社会：能够基于物联网系统中的工程相关背景知识进行合理分析，评价物联网系统对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

7. 环境和可持续发展：能够认识和评价物联网系统中的部件、环节及系统应用对环境、社会可持续发展的影响。

8. 职业规范：具有人文社会科学素养、社会责任感，能够在物联网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。

9. 个人和团体：能够在多学科背景下的团体中承担个体、团队成员以及负责人的角色。

10. 沟通：能够就物联网装置/单元中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、陈述发言和清晰对话。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。

11. 项目管理：理解并掌握物联网工程管理原理与经济决策方法，并能在多学科环境中应用。

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。

Ⅲ.Skills Profile

Students should improve in the moral, intellectual and physical. Their knowledge, ability and high quality should get coordinated development. They should have the solid foundation of math, natural science, humanity and social science, and engineering technology theory. They should have broad Internet of Things engineering knowledge and practical ability, have the basic ability to analyze, design, make, debug and test the Internet of Things equipment or units.

The graduates should have the following knowledge, ability and quality.

1. Engineering Knowledge

The graduates should have the knowledge of math, natural science, and engineering which is needed by Internet of Things engineering. They can also use the theory and methods in applied mathematics, natural science and so on, use the professional knowledge and skills in engineering foundation, Internet of Things engineering and some other related areas to solve the complicated engineering problems in the designing, making, debugging and applying of the Internet of Things equipment or units.

2. Problem Analysis

The graduates can apply the basic principles of applied mathematics, natural science and engineering science to study the literature, analyze the complicated engineering problems in Internet of Things equipment or units, and obtain the effective conclusion.

3. Design/Develop Solutions

According to the complicated engineering problems in the Internet of Things units design, the graduates can provide the reasonable solutions and design the Internet of Things system, core units and technical process to satisfy the specific users and specifications. There will be some certain innovation consciousness in the design. Besides, the society, health, security, law, culture, environment and other factors should be considered.

4. Research

The graduates can study the Internet of Things modules or units problems based on the relevant scientific principles and methods, including designing the experiments, analyzing and explaining data, and obtaining the reasonable and effective conclusion through the information.

5. Apply Modern Tools

According to the complicated engineering problems in the design, developing, debugging and applying of the Internet of Things equipment or units, the graduates can develop, choose and use the proper technology, resource, modern engineering tools and information technology tools, including predicting and simulating questions, and also can understand the limitations.

6. Engineering and Society

Based on the relevant background knowledge, the graduates can evaluate influences of specific engineering practices and solutions on the society, health, security, law and culture, and understand the responsibility.

7. Environment and Sustainable Development

The graduates can understand and evaluate influences of specific engineering practices on the environment and sustainable development.

8. Professional Norms

The graduates should have the humanistic quality and social responsibility, understand and comply with the professional ethics and norms in the practice of Internet of Things engineering, taking responsibility.

9. Individual and Team

The graduates should have team cooperation consciousness, and play the roles in a multi-disciplinary team.

10. Communication

The graduates can communicate with industry peers and the public effectively on the complicated engineering problems of the Internet of Things equipment or units, including writing reports, designing presentations and speaking clearly. They also should have a certain international vision, and can communicate under the cross cultural background.

11. Project Management

The graduates can understand and master the principles of Internet of Things engineering management and economic decision-making methods, and apply them in the multi-disciplinary situation.

12. Lifelong Learning

The graduates should have the consciousness of self-learning and lifelong learning. They should have the ability to learn constantly and adapt the development.

四、专业特色

本专业着重在物联网感知与控制、物联网通信与组网、物联网数据处理、物联网软件与服务等领域，以课程设计、毕业设计、创新实践为导引，培养学生的工程应用、实践开发、创新意识为主要特色。

Ⅳ.Specialty Features

The major focuses on the field of perception and control in IoT, networking and communication in IoT, data processing in IoT, software and services in IoT, with the guidance of curriculum design, graduation design, and innovative practice, to train students' engineering application, development practice, and innovative consciousness as the main characteristics.

五、主干学科、专业核心课程、学位课程

主干学科：信息与通信工程、计算机科学与技术

专业核心课程：物联网工程专业导论 1、物联网工程专业导论 2、计算机网络 E、单片机应用技术、无线传感器网络、RFID 应用系统 A、系统应用软件技术（JAVA/C++方向二选一）、系统处理器技术（FPGA/ARM 方向二选一）、物联网系统设计与应用。

学位课程：综合英语 4、高等数学 A2、电路分析基础 A1、电路分析基础 A2、软件技术基础 A、计算机原理及应用、计算机原理及应用实验、计算机网络 E、信号与系统 B、单片机应用技术、无线传感器网络。

Ⅴ.Core Disciplines and Courses

Core Disciplines: Information and Communication Engineering, Computer Science and Technology.

Core Courses: Professional Introduction 1 of Internet of Things Engineering, Professional Introduction 2 of Internet of Things Engineering, Computer Networks E, Application technology of microcomputer, Wireless Sensor Network, RFID Application system A, System Application Software Technology (Java/C++ the alternative), System Processor Technology (FPGA / ARM the alternative), Design and Application of Internet of Things System.

Degree Courses: Integrated English 4, Advanced Mathematics A2, Circuit Analysis Foundation A1, Circuit Analysis Foundation A2, Software Technology Foundation A, Computer Principles and Applications, Experiments of Computer Principles and Applications, Computer Networks E, Signals and systems B, Application technology of microcomputer, Wireless Sensor

Network.

六、学分分配

Ⅵ.Credits of Courses

类别 Type of Course	必修 Required			选修 Elective		集中实践环节 Practice Training	合计(比例) Total(%)
	通识教育 Basic Courses in General Education	学科（大类）教育 Basic Courses in General Discipline	专业教育 Specialty-oriented Courses	通识教育 Basic Courses in General Education	个性化教育 Characteristic Education Courses		
理论学分 Theory Credits	34	27	43	6	9.5	0	69.07%
实践学分 Practice Credits	8	4	13.5	0	3	25	30.93%
小计 Subtotal	42	31	56.5	6	12.5	25	
比例（%） Proportion(%)	24.28%	17.92%	32.66%	3.47%	7.23%	14.45%	100%

七、专业教学计划

Ⅶ.Table of Teaching Schedule

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
通识教育平台 Basic Courses in General Education	必修 Required	1	XG160010	入学教育 Entrance Education	0.5	8		8			1				考试
		2	GF160930	军事理论 Military Theory	0.5	36	16			20	2				考试
		3	BW160010	军事技能训练 Military Skill Training	0.5	32		32			1				考查
		4	自选项目	体育项目 1-4 Sports Items 1-4	4	128		128			1-4				考试
		5	TY160031	体能训练及体质达标测试 1 Physical Training& Physical Fitness Test 1	0.5	8		8			5				考试
		6	TY160032	体能训练及体质达标测试 2 Physical Training& Physical Fitness Test 2	0.5	8		8			6				考试
		7	MY160210	思想道德修养与法律基础 Thought Morals Tutelage and Legal Foundation	3	48	48				2				考试
		8	MY160360	中国近现代史纲要 Chinese Modern History	2	32	32				1				考试
		9	MY160080	马克思主义基本原理概论 Introduction to the Basic Principles of Marxism	3	48	48				3				考试
		10	MY160110	毛泽东思想与中国特色社会主义理论体系概论 An Introduction to Mao Zedong Thought and The Theoretical System of Socialism With Chinese Characteristics	4	64	64				4				考试
		11	MY160041	形势与政策 1 Situation and Policy 1	0.5	8	8				1				考查
		12	MY160042	形势与政策 2 Situation and Policy 2	0.5	8	8				2				考查
		13	MY160033	形势与政策 3 Situation and Policy 3	0.5	8	8				3				考查
		14	MY160024	形势与政策 4 Situation and Policy 4	0.5	8	8				4				考查
		15	MY160280	思想政治理论课实践教学 The Practice Teaching of Ideological and Political	2	32		32			3				考试

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
				Theory											
		16	WY160371	综合英语 1 Integrated English 1	3	48	48				1				考试
		17	WY160372	综合英语 2 Integrated English 2	3	48	48				2				考试
		18	WY160203	综合英语 3 Integrated English 3	2	32	32				3				考试
		19	WY160104	综合英语 4 Integrated English 4	2	32	32				4	★			考试
		20	JK160230	大学计算机（理工 A） College Basic Computer（A, for Students of Science and Engineering）	2	32	32				1				考试
		21	JK160380	计算机基本技能训练 Computer Application Skill Training	1	16			16		1				考试
		22	FX160020	大学生心理健康教育 Mental Health Education of College Students	1	16	10	6			1				考试
		23	JW160020	就业创业基础 Employment and Entrepreneurship Foundation	2.5	40	40				6				考试
		24	JW160010	创新思维与方法 Innovative Thinking and Methods	1	16	16				4				考试
		25	JG161360	经济管理概论 Generality of Economics and Management	2	32	32				5				考试
	小计 Subtotal				**42**	**788**	**530**	**222**	**16**	**20**					
	选修 Elective	选修全校通识选修课 6 学分									2-8				
	小计 Subtotal				**6**										
合计 Total					**48**										
学科（大类）教育平台 Basic Courses in General Discipline	必修 Required	1	LX160071	高等数学 A1 Advanced Mathematics A1	6	96	96				1				考试
		2	LX160072	高等数学 A2 Advanced Mathematics A2	6	96	96				2	★			考试
		3	LX160230	概率论与数理统计 B Probability and Mathematical Statistics B	3	48	48				3				考试
		4	LX160840	线性代数 A Linear Algebra A	3	48	48				1				考试
		5	LX161390	大学物理 E University Physics E	5	80	80				2				考试
		6	LX160051	大学物理实验 C1 University Physics Experiment C1	1	16			16		3				考查
		7	LX160052	大学物理实验 C2 University Physics Experiment C2	1	16			16		4				考查
		8	GC160050	工程训练 E Engineering Training E	1	16		16			2				考查
		9	LX160210	复变函数与积分变换 Functions of Complex Variable and Integral Transforms	2	32	32				3				考试
		10	XX161520	程序设计基础 C（C 语言） C Language Programming Foundation C	3	48	32		16		1				考试
合计 Total					**31**	**496**	**432**	**16**	**48**						
specialty-oriented	Required 专业必修	1	XX160031	电路分析基础 A1 Circuit Analysis Fundamentals A1	2	32	32				2	★	◆		考试

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		2	XX160032	电路分析基础 A2 Circuit Analysis Fundamentals A2	2	32	32				3	★	◆		考试
		3	XX160041	电路分析基础实验 A1 Experiments of Circuit Analysis Fundamentals A1	0.5	8			8		2		◆		考查
		4	XX160880	数字电子技术 Digital Electronic Technology	3.5	56	56				2		◆		考试
		5	XX161740	数字电子技术实验 A Experiments of Digital Electronic Technology A	1	16			16		2		◆		考查
		6	XX161700	软件技术基础 A Software Technology Foundation A	2.5	40	32		8		3	★	◆		考试
		7	XX160700	模拟电子技术 Analog Electronic Technology	3.5	56	56				3				考试
		8	XX160710	模拟电子技术实验 Experiments of Analog Electronic Technology	1	16			16		3				考查
		9	XX160610	计算机原理及应用 Computer Principles and Applications	3	48	48				3	★	◆		考试
		10	XX160620	计算机原理及应用实验 Experiments of Computer Principles and Applications	0.5	8			8		3	★			考查
		11	XX161880	现代通信原理 A Modern Communication Principle A	4	64	64				6				考试
		12	XX161140	现代通信原理实验 Experiments of Modern Communication Principle	1	16			16		6				考查
		13	XX161170	信号与系统 B Signals and systems B	4	64	64				5	★	◆		考试
		14	XX160090	传感器原理及应用 A Sensor Principles and Applications A	3	48	40		8		5				考试
		小计 subtotal			**31.5**	**504**	**424**		**80**						
	专业核心课程 specialized core courses	1	XX160061	物联网工程专业导论 1 Professional Introduction 1 of Internet of Things Engineering	0.5	8	8				1				考查
		2	XX160062	物联网工程专业导论 2 Professional Introduction 2 of Internet of Things Engineering	0.5	8	8				2				考查
		3	XX161640	计算机网络 E Computer Networks E	4	64	48		16		4	★	◆		考试
		4	XX161540	单片机应用技术 Application technology of microcomputer	3	48	32		16		4	★	◆		考试
		5	XX161010	无线传感器网络 Wireless Sensor Network	3	48	40		8		5	★	◆		考试
		6	XX161510	RFID 应用系统 A RFID Application system A	3	48	40		8		6				考试
		7	XX161860	系统应用软件技术（JAVA/C++方向二选一） System Application Software Technology(Java/C++ the alternative)	3	48	24		24		5				考查
		8	XX161850	系统处理器技术（FPGA/ARM 方向二选一） System Processor Technology (FPGA / ARM the alternative)	3	48	24		24		4				考试
		9	XX161720	数据库技术 C Database Technology C	2	32	16		16		4				考查
		10	XX161070	物联网系统设计与应用 Design and Application of	3	48	24		24		6				考查

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
				Internet of Things System											
		小计 subtotal			**25**	**400**	**264**		**136**						
	集中实践环节 Practice raining	1	XX161040	物联网工程专业认识实习 Cognition Practice of Internet of Things Engineering	1	16		16			1				考查
		2	XX160400	电子技术课程设计 Course Design of Electronic Technology	2	32		32			4				考查
		3	XX160770	软件技术课程设计 Course Design of Software Technology	2	32		32			5				考查
		4	XX161840	物联网工程专业项目实训 Project Training of Internet of Things Engineering	3	48		48			7				考查
		5	XX161050	物联网工程专业生产实习 Production Practice of Internet of Things Engineering	2	32		32			7				考查
		6	XX161020	物联网工程专业毕业设计 Graduation Design of Internet of Things Engineering	12	192		192			8				考查
		7	XX161030	物联网工程专业毕业实习 Graduation Practice of Internet of Things Engineering	3	48		48			8				考查
		小计 subtotal			**25**	**400**		**400**							
合计 Total					**81.5**	**1304**	**688**	**400**	**216**						
个性化教育平台 Characteristic Education Courses	选修 Elective	本专业/跨专业选修课程共计 **9.5** 学分。5-7 学期开设。 1. 学生可根据自身发展方向修读本专业或跨专业个性化平台选修课。 2. 个性化平台选修课详见《西南科技大学个性化平台选修课程选课指导与修读手册》。													
	创新创业实践必修 Required	创新创业实践系列项目（学术报告/科研项目/创新创业项目/科技竞赛等）共 3 学分。1-8 学期开设。 Serial Program on Innovation and entrepreneurship practice (academic presentation/research project/innovation and entrepreneur program/ Scientific and technical contest, etc.), in total 3 credits.													
合计 Total					**12.5**										
共计 Total					**173**										

注：1. 标注★的为“学位课程”，标注◆的为“辅修课程”，标注▲的为“双学位课程”；标注△的为双语课程，标注☆的为全英文教学课程。

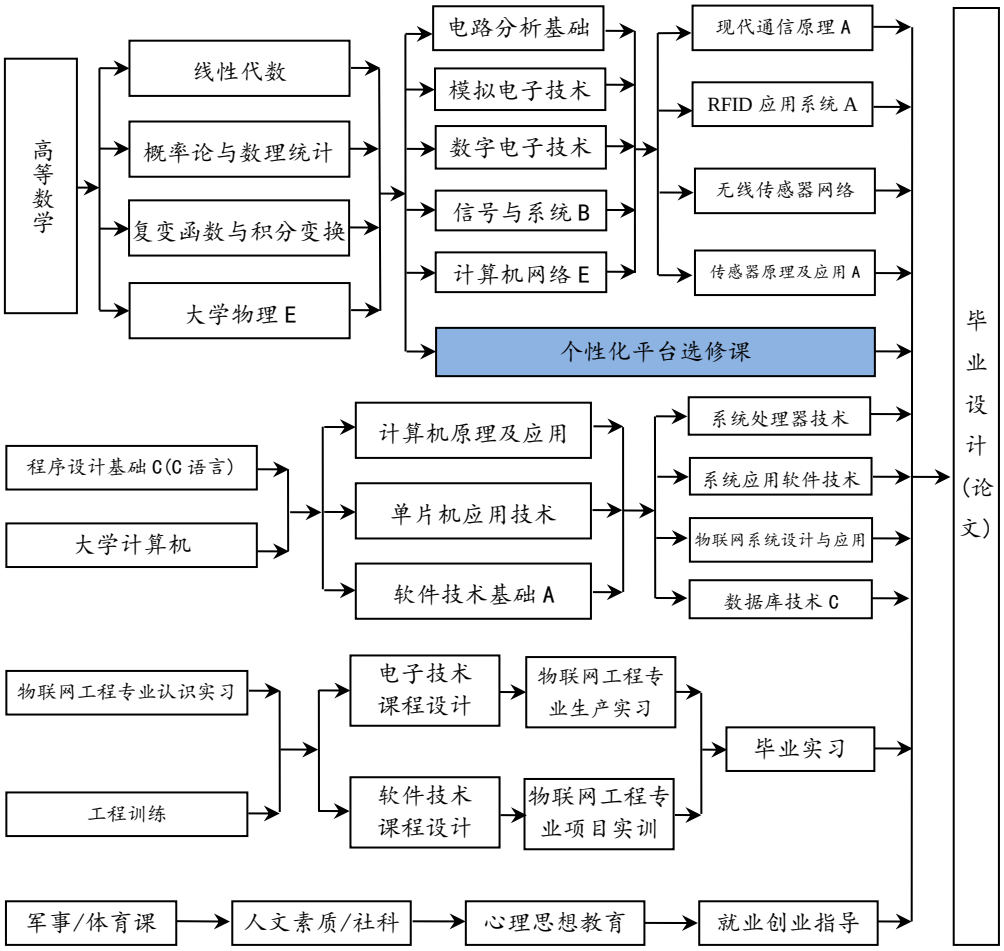
2. 课程考核方式分为考试和考查。

Remarks:

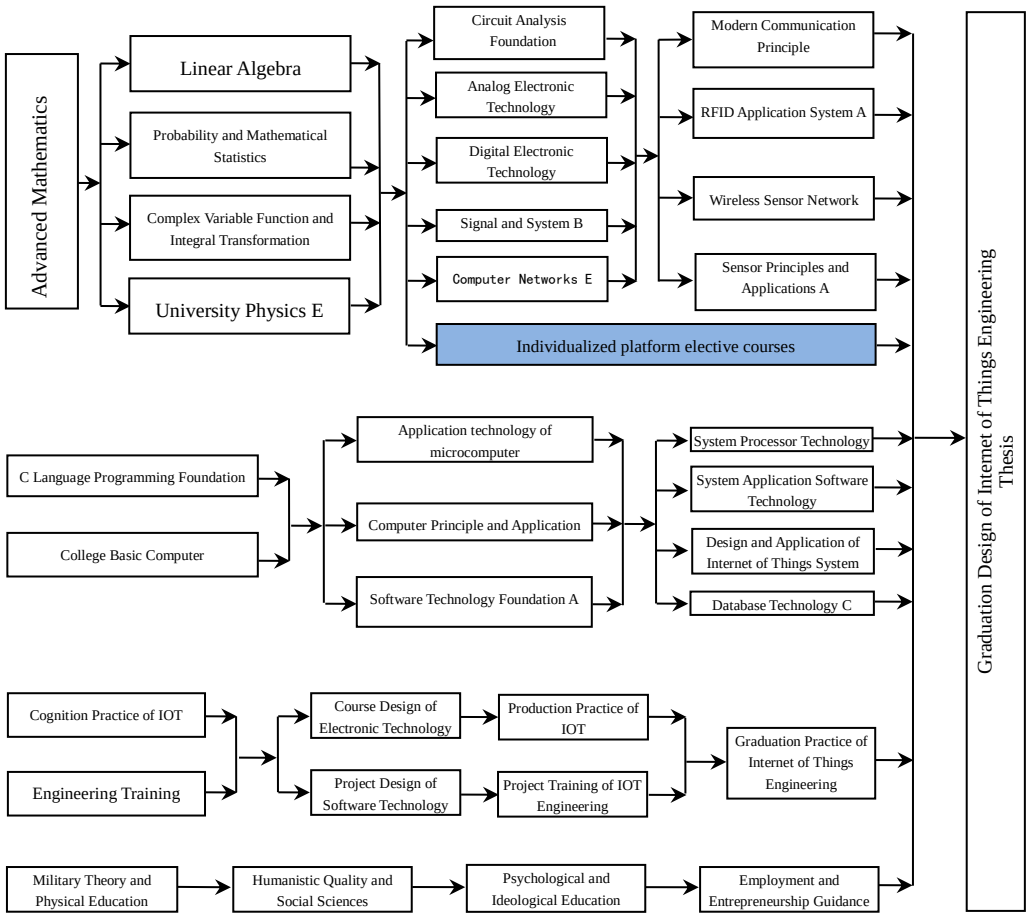
1. ★stands for “degree course”, ◆ stands for “minor course”, ▲ stands for “bi-language course”, △stands for the course is in bi-language, ☆stands for the course is all in English.

2.“ExaminationonMode” includes “examination” or “check”.

八、课程配置流程图


高等数学
线性代数
概率论与数理统计
复变函数与积分变换
大学物理 E
电路分析基础
模拟电子技术
数字电子技术
信号与系统 B
计算机网络 E
个性化平台选修课
现代通信原理 A
RFID 应用系统 A
无线传感器网络
传感器原理及应用 A
程序设计基础 C(C 语言)
大学计算机
计算机原理及应用
单片机应用技术
软件技术基础 A
系统处理器技术
系统应用软件技术
物联网系统设计与应用
数据库技术 C
物联网工程专业认识实习
工程训练
电子技术课程设计
软件技术课程设计
物联网工程专业生产实习
物联网工程专业项目实训
毕业实习
军事/体育课
人文素质/社科
心理思想教育
就业创业指导
毕业设计(论文)

Ⅷ. Flow for Courses Configuration



九、各学期应修学分分布表

Ⅸ.Credit's Table for each Semester

学期 Semester	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th	学分合计 Total
必修学分 Compulsory Credits	24	26.5	26	22.5	17.5	14	5	15	150.5
	4（体育）								13
		6（通识选修）							
	3（创新创业实践）								
建议专业限选学分 Optional Credits					2	4	4		≥9.5
合计 Totals									173

十、说明

选修课的修学计划须在班主任和专业导师指导下完成。

Ⅹ.Instructions

The plan for elective courses should be implemented under the guidance of a head teacher or a mentor.

自动化专业培养方案
Undergraduate Program for Specialty in Automation

专业负责人：吴 斌　　主管院长：姚远程　　院学术委员会主任：邹传云

Director of Specialty: Bin Wu

Executive Dean: Yuancheng Yao

Academic Committee Director: Chuanyun Zou

一、修业年限及授予学位名称

学制 4 年，最低毕业学分 170，允许学习年限为 3-6 年。授予工学学士学位。

Ⅰ. Length of Schooling and Degree

Duration: 4years

Lowest credits for graduation: 170

Allowable period of schooling: 3 to 6 years

Degrees Conferred: Bachelor of Engineering

二、培养目标

本专业培养能够综合运用自然科学、工程科学的基础理论与专业知识，分析和解决自动化专业领域的复杂工程问题，具备在自动化或相关工程领域进行技术开发、系统集成、设备运行维护、工程项目的实施管理等方面的工作能力，能在团队中进行有效交流与合作，具有较高的思想政治素质、社会责任感、职业道德、创新意识和善于学习的应用型高层次人才。

Ⅱ. Educational Objectives

The specialty aims at bringing up the "Application-oriented high-level talents", who are capable of comprehensively applying the basic theory and professional knowledge of natural science and engineering science to analyze and solve complex engineering problems in the field of automation, as well as having the ability to carry out technical development, system integration, equipment operation and maintenance, project management and other aspects in automation or related engineering field. They should also possess the following qualities: to be able to communicate and cooperate effectively in the team, have high ideological and political quality, social responsibility, professional ethics, innovative consciousness and be good at learning.

三、培养规格及要求

毕业生应获得以下几方面的知识和能力：

1．工程知识：能够将数学、自然科学、工程基础和专业知识用于解决自动化专业领域的复杂工程问题。

2．问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析自动化专业领域的复杂工程问题，以获得有效结论。

3．设计/开发解决方案：能够设计针对自动化专业领域复杂工程问题的解决方案，设计出满足特定要求的系统，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。

4．研究：能够基于科学原理并采用科学方法对自动化领域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。

5．使用现代工具：能够针对自动化领域中的复杂工程问题，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，包括对自动化专业领域复杂工程问题的预测和模拟，并能够理解其局限性。

6．工程与社会：能够基于工程相关背景知识进行合理分析，评价自动化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。

7．环境和可持续发展：能够理解和评价针对自动化专业领域的复杂工程问题的具体工程实践对环境、社会可持续发展的影响。

8．职业规范：具有人文社会科学素养、社会责任感，能够在自动化专业领域的工程实践中理解并遵守工程职业道德和规范，履行责任。

9．个人和团体：能够在多学科背景下的团体中承担个体、团队成员以及负责人的角色。

10．沟通：能够就自动化专业领域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。

11．项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。

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。

Ⅲ. Skills Profile

The graduates should acquire the following knowledge and abilities:

1．Engineering knowledge: the ability to use mathematics, natural sciences, engineering foundations and expertise to solve complex engineering problems in the field of automation.;

2．Problem analysis: able to apply the basic principles of mathematics, natural science and engineering science; recognizing, expressing and analyzing complex engineering problems through literature research in the field of automation specialty, in order to obtain valid conclusions;

3．Design/development of solutions: able to devise solutions of complex engineering problems in the automation field and design systems to meet specific requirements; in the process, capable of reflecting innovation consciousness and considering the social, health, safety, legal, cultural, environmental and other factors.

4．Research: able to study complex engineering problems in the field of automation based on scientific principles and scientific methods, including experiment design, data analysis and interpretation, and reasonable and effective conclusion obtaining through comprehensive information.

5．Modern tool utilization: able to develop, select and use proper technology, resources, modern engineering tools and information technology to solve complex engineering problems in automation field, including predicting and simulating of these problems, as well as to understand their limitations.

6．Engineering and society: can carry on reasonable analysis based on related engineering background knowledge, evaluate influence of automation engineering practice and complex engineering solutions on society, health, safety, law and culture, and understand the responsibilities.

7．Environment and sustainable development: the ability to understand and evaluate the impact of concrete engineering practices of complex engineering problems on the environment and social sustainability in the field of automation.

8．Professional ethics: able to possess humanistic and social science literacy and social responsibility, understand and abide by engineering ethics and norms in the engineering practice of automation specialty, and fulfill responsibilities.

9．Individuals and groups: able to take on the role of individuals, team members, and responsible person in a multi-disciplinary community.

10．Communication: able to communicate effectively with the industry peers and the social public communication on complex engineering problems in the field of automation, including writing reports, designing documents, presenting speech and clearly expressing or responding to commands; have a certain international vision and able to communicate in a cross-cultural context.

11．Project management: understand and master the engineering management principles and economic decision-making methods, and can apply them in multi-disciplinary environment.

12．Lifelong learning: possess senses of self-learning and lifelong learning, and able to learn constantly and

adapt to development.

四、专业特色

本专业以社会需求为导向，在学校“共建与产学研联合办学”思想指导下，以“强化学生工程实践能力培养”为目标，培养具有扎实的工程理论基础，熟练掌握自动化领域设计开发的核心技能，能综合运用专业知识分析和解决实际工程问题，具有科技创新精神的应用型高层次人才。

Ⅳ. Specialty Features

Oriented to the needs of society, guided by the thoughts of ‘construction and cooperative education’ of the university, this discipline aims to strengthen the students' ability of engineering practice. We foster students with solid engineering theoretical foundation, the students should master core skills of automation design and development, have the ability of integrated usage of professional knowledge and solving the practical engineering problems with innovation spirit.

五、主干学科、专业核心课程、学位课程

主干学科：控制科学与工程、电气工程、计算机技术与科学

专业核心课程：电机与拖动 A、电力电子技术 A、检测技术 C、电气控制及 PLC、过程控制及仪表、计算机控制系统

学位课程：综合英语 4、高等数学 A2、程序设计基础 C（C 语言）、电路分析基础 A1、电路分析基础 A2、数字电子技术、电机与拖动 A、电力电子技术 A、检测技术 C、自动控制理论 C、自动化专业综合设计

Ⅴ. Core Disciplines and Courses

Core Disciplines: Control Science and Engineering, Electrical Engineering, Computer Technology and Science.

Core Courses: Motor and Drag A, Power Electronics Technology A, Detection Technology C, Process Control and Instrumentation, Computer Control System

Degree Course： Comprehensive English 4, Higher Mathematics A2, C Language Programming Foundation C, Fundamentals of Circuit Analysis A1, Fundamentals of Circuit Analysis A2, Digital Electronics, Electrical Machinery and Towage A, Power Electronics Technology A, Detection Technology C, Automatic Control Theory C, Comprehensive Design of Automation

六、学分分配

Ⅵ. Credits of Courses

类别 Type of Course	必修 Required			选修 Elective		集中实践环节 Practice Training	合计(比例) Total(%)
	通识教育 Basic Courses in General Education	学科（大类）教育 Basic Courses in General Discipline	专业教育 Specialty-oriented Courses	通识教育 Basic Courses in General Education	个性化教育 Characteristic Education Courses		
理论学分 Theory Credits	33	29	36.5	6	10	0	67.4%
实践学分 Practice Credits	9	5	9.5	0	5	27	32.6%
小计 Subtotal	42	34	46	6	15	27	170

比例（%） Proportion(%)	24.7%	20%	27.1%	3.5%	8.8%		15.9%	100%

七、专业教学计划

Ⅶ. Table of Teaching Schedule

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
通识教育平台 Basic Courses in General Education	必修 Required	1	XG160010	入学教育 Entrance Education	0.5	8	0	8	0	0	1				考试 exam
		2	GF160930	军事理论 Military Theory	0.5	36	16	0	0	20	2				考试 exam
		3	BW160010	军事技能训练 Military Skills	0.5	32	0	32	0	0	1				考试 exam
		4	自选项目	体育项目 1-4 Sports Items	4	128	0	128	0	0	1-4				考试 exam
		5	TY160031	体能训练及体质达标测试 1 Physical Training& Physical Fitness Test 1	0.5	8	0	8	0	0	1				考试 exam
		6	TY160032	体能训练及体质达标测试 2 Physical Training& Physical Fitness Test 2	0.5	8	0	8	0	0	2				考试 exam
		7	MY160210	思想道德修养与法律基础 Thought Morals Tutelage and Legal Foundation	3	48	48	0	0	0	2				考试 exam
		8	MY160360	中国近现代史纲要 Chinese Modern History	2	32	32	0	0	0	1				考试 exam
		9	MY160080	马克思主义基本原理概论 Introduction to The Basic Principles of Marxism	3	48	48	0	0	0	3				考试 exam
		10	MY160110	毛泽东思想与中国特色社会主义理论体系概论 An Introduction to Mao Zedong Thought and The Theoretical System of Socialism With Chinese Characteristics	4	64	64	0	0	0	4				考试 exam
		11	MY160041	形势与政策 1 Situation and Policy 1	0.5	8	8	0	0	0	1				考查 non-exam
		12	MY160042	形势与政策 2 Situation and Policy 2	0.5	8	8	0	0	0	2				考查 non-exam
		13	MY160033	形势与政策 3 Situation and Policy 3	0.5	8	8	0	0	0	3				考查 non-exam
		14	MY160024	形势与政策 4 Situation and Policy 4	0.5	8	8	0	0	0	4				考查 non-exam
		15	MY160280	思想政治理论课实践教学 The Practice Teaching of Ideological and Political Theory	2	32	0	32	0	0	3				考查 non-exam
		16	WY160371	综合英语 1 Integrated English 1	3	48	48	0	0	0	1				考试 exam
		17	WY160372	综合英语 2 Integrated English 2	3	48	48	0	0	0	2				考试 exam
		18	WY160203	综合英语 3 Integrated English 3	2	32	32	0	0	0	3				考试 exam
		19	WY160104	综合英语 4 Integrated English 4	2	32	32	0	0	0	4	★			考试 exam
		20	JK160230	大学计算机（理工 A） College Basic Computer (A, for Students of Science and Engineering)	2	32	32	0	0	0	1				考查 non-exam
		21	JK160380	计算机基本技能训练 Computer Application Skill Training	1	16	0	0	16	0	1				考试 exam

课程类别 Course Classified	课程性质 Course Nature	序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
						总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
		22	FX160020	大学生心理健康教育 Mental Health Education of College Students	1	16	10	6	0	0	1				考试 exam
		23	JW160020	就业创业基础 Employment and Entrepreneurship Foundation	2.5	40	40	0	0	0	3				考查 non-exam
		24	JW160010	创新思维与方法 Innovative Thinking and Methods	1	16	16	0	0	0	4				考试 exam
		25	JG161360	经济管理概论 Generality of Economics and Management	2	32	32	0	0	0	3				考试 exam
	小计 Subtotal				**42**	**788**	**530**	**222**	**16**	**20**					
	选修 Elective	选修全校通识选修课 6 学分									2-8				
	小计 Subtotal				**6**	**96**	**96**	**0**	**0**	**0**					
合计 Total					**48**	**884**	**626**	**222**	**16**	**20**					
学科（大类）教育平台 Basic Courses in General Discipline	必修 Required	1	LX160071	高等数学 A1 Advanced Mathematics A1	6	96	96	0	0	0	1				考试 exam
		2	LX160072	高等数学 A2 Advanced Mathematics A2	6	96	96	0	0	0	2	★			考试 exam
		3	LX160230	概率论与数理统计 B Probability and Mathematical Statistics B	3	48	48	0	0	0	3				考试 exam
		4	LX160840	线性代数 A Linear Algebra A	3	48	48	0	0	0	2				考试 exam
		5	LX160210	复变函数与积分变换 Functions of Complex Variable and Integral Transforms	2	32	32	0	0	0	3				考试 exam
		6	LX161390	大学物理 E University Physics E	5	80	80	0	0	0	2				考试 exam
		7	LX160051	大学物理实验 C1 University Physics Experiment C1	1	16	0	0	16	0	3				考查 non-exam
		8	LX160052	大学物理实验 C2 University Physics Experiment C2	1	16	0	0	16	0	4				考查 non-exam
		9	XX161520	程序设计基础 C（C 语言） C Language Programming Foundation C	3	48	32	0	16	0	1	★		▲	考试 exam
		10	GC160040	工程训练 D Engineering Training D	2	32	0	32	0	0	3				考查 non-exam
		11	ZZ160450	工程制图 C Engineering Drawing C	2	32	32	0	0	0	1				考查 non-exam
合计 Total					**34**	**544**	**464**	**32**	**48**	**0**					
Required 专业教育平台 Specialty-oriented Course	必修 课程 specialized basic	1	XX161530	单片机基础与实践 SCM Basis and Practice	3	48	32	0	16	0	1				考查 non-exam

课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
			2	XX160031	电路分析基础 A1 Circuit Analysis Fundamentals A1	2	32	32	0	0	0	2	★	◆	▲	考试 exam
			3	XX160032	电路分析基础 A2 Circuit Analysis Fundamentals A2	2	32	32	0	0	0	3	★	◆	▲	考试 exam
			4	XX160041	电路分析基础实验 A1 Experiments of Circuit Analysis Fundamentals A1	0.5	8	0	0	8	0	2				考查 non-exam
			5	XX160042	电路分析基础实验 A2 Experiments of Circuit Analysis Fundamentals A1	0.5	8	0	0	8	0	3				考查 non-exam
			6	XX160700	模拟电子技术 Analog Electronic Technology	3.5	56	56	0	0	0	3		◆	▲	考试 exam
			7	XX160880	数字电子技术 Digital Electronic Technology	3.5	56	56	0	0	0	4	★	◆	▲	考试 exam
			8	XX160710	模拟电子技术实验 Experiments of Analog Electronic Technology	1	16	0	0	16	0	3				考查 non-exam
			9	XX161740	数字电子技术实验 A Digital Electronic Technological Experiment A	1	16	0	0	16	0	4				考查 non-exam
			10	XX160610	计算机原理及应用 Computer Principles and Applications	3	48	48	0	0	0	5			▲	考试 exam
			11	XX160620	计算机原理及应用实验 Experiments of Computer Principles and Applications	0.5	8	0	0	8	0	5				
			12	XX161180	信号与系统 D Signals and Systems D	2	32	32	0	0	0	4				考试 exam
			13	XX161930	自动控制理论 C Automatic Control Theory C	4	64	56	0	8	0	5	★	◆	▲	考试 exam
			14	XX161600	工业数据通信与控制网络 Industrial Data Communication and Control Network	2.5	40	32	0	8	0	4				考试 exam
		专业核心课程 specialized core courses	1	XX161550	电机与拖动 A Electrical Machinery and Towage A	3.5	56	40	0	16	0	4	★	◆	▲	考试 exam
			2	XX161560	电力电子技术 A Power Electronic Technology A	3	48	40	0	8	0	5	★	◆	▲	考试 exam
			3	XX161650	检测技术 C Detection Technology C	2.5	40	32	0	8	0	5	★	◆	▲	考试 exam
			4	XX161590	电气控制及 PLC Electrical Control and PLC	2.5	40	32	0	8	0	6				考试 exam
			5	XX161620	过程控制及仪表 Process Control and Instrument	2.5	40	32	0	8	0	6		◆	▲	考试 exam

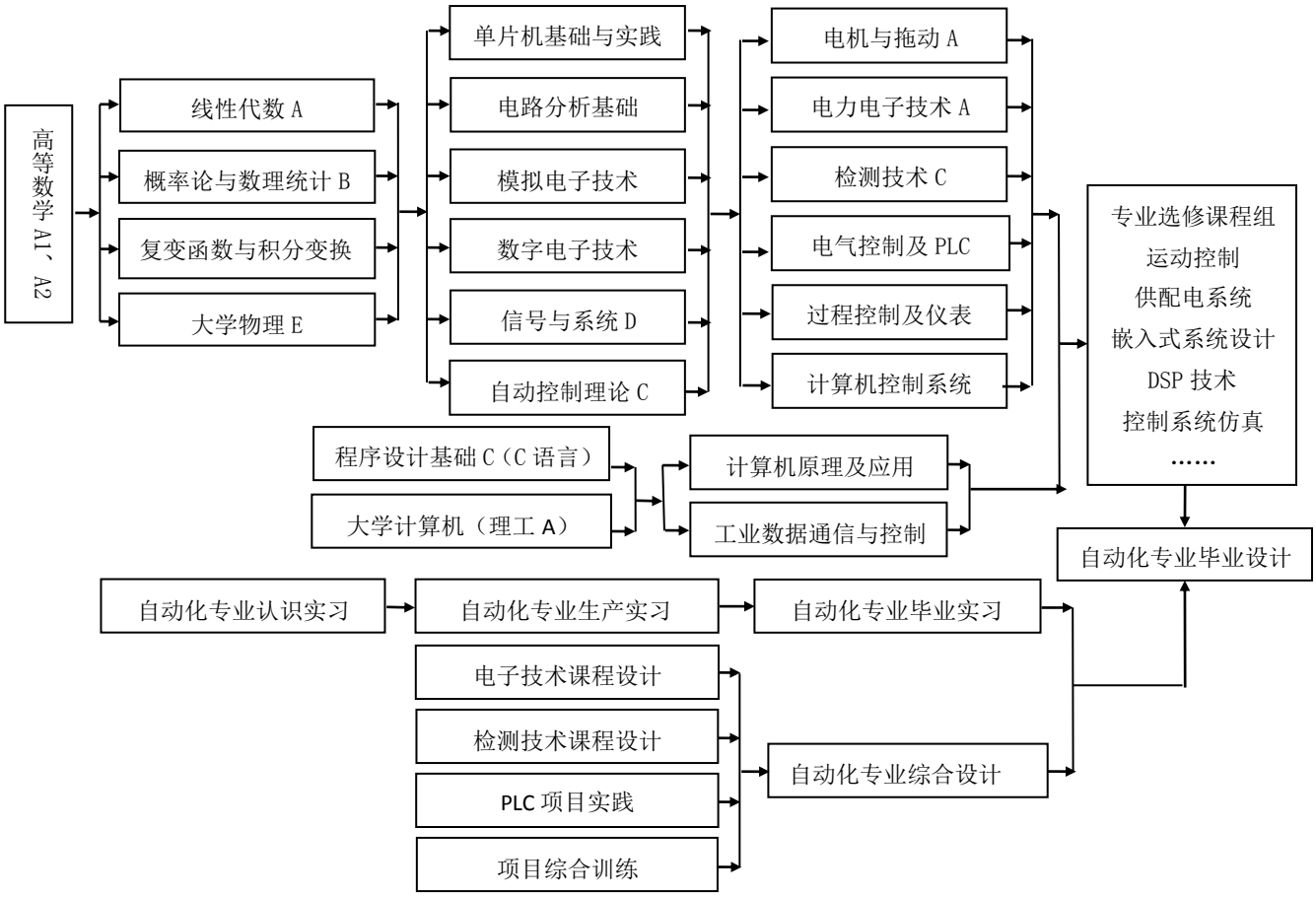
课程类别 Course Classified	课程性质 Course Nature		序号 NO.	课程编号 Course Code	课程名称 Course Name	总学分 Credits	学时 Hours					开课学期 Semester	学位课 Degree Course	辅修 Minor	双学位 Double Degree	考核方式 Examination Mode
							总学时 Total	理论学时 Theory	实践学时 Practice	实验学时 Experiment	网络学时 Online Learning					
			6	XX160580	计算机控制系统 Computer Control System	3	48	40	0	8	0	6				考查 non-exam
		集中实践环节 Practice raining	1	XX160400	电子技术课程设计 Course Design of Electronic Technology	2	32	0	32	0	0	4			▲	考查 non-exam
			2	XX161660	检测技术课程设计 Course Design of Detection Technology	1	16	0	16	0	0	5				考查 non-exam
			3	XX161500	PLC 项目实践 Project practice of PLC	1	16	0	16	0	0	6				考查 non-exam
			4	XX161890	项目综合训练 Project Comprehensive Training	2	32	0	32	0	0	7				考查 non-exam
			5	XX161300	自动化专业认识实习 Cognition Practice of Automation	1	16	0	16	0	0	2			▲	考查 non-exam
			6	XX161310	自动化专业生产实习 Production Practice of Automation	2	32	0	32	0	0	6				考查 non-exam
			7	XX161320	自动化专业综合设计 Comprehensive Design of Automation	3	48	0	48	0	0	7	★	◆	▲	考查 non-exam
			8	XX161290	自动化专业毕业实习 Graduation Practice of Automation	3	48	0	48	0	0	8			▲	考查 non-exam
			9	XX161280	自动化专业毕业设计 Graduation Design of Automation	12	192	0	192	0	0	8			▲	考查 non-exam
合计 Total						**73**	**1176**	**592**	**432**	**152**	**0**					
个性化教育平台 Characteristic Education Courses	选修 Elective		本专业/跨专业选修课程共计 12。(Law major/cross major courses, in total 28 credits)。1-8 学期开设。 1. 学生可根据自身发展方向修读本专业选修课或跨专业修读全校其他专业开设的个性化平台选修课。 2. 跨专业个性化化平台选修课详见《西南科技大学个性化平台选修课程选课指导与修读手册》。													
	创新创业实践必修 Required		创新创业实践系列项目（学术报告/科研项目/创新创业项目/科技竞赛等）共 3 学分。1-8 学期开设。 Serial Program on Innovation and entrepreneurship practice (academic presentation/research project/innovation and entrepreneur program/ Scientific and technical contest, etc.), in total 3 credits.													
合计 Total						**15**										
共计 Total						**170**										

注：

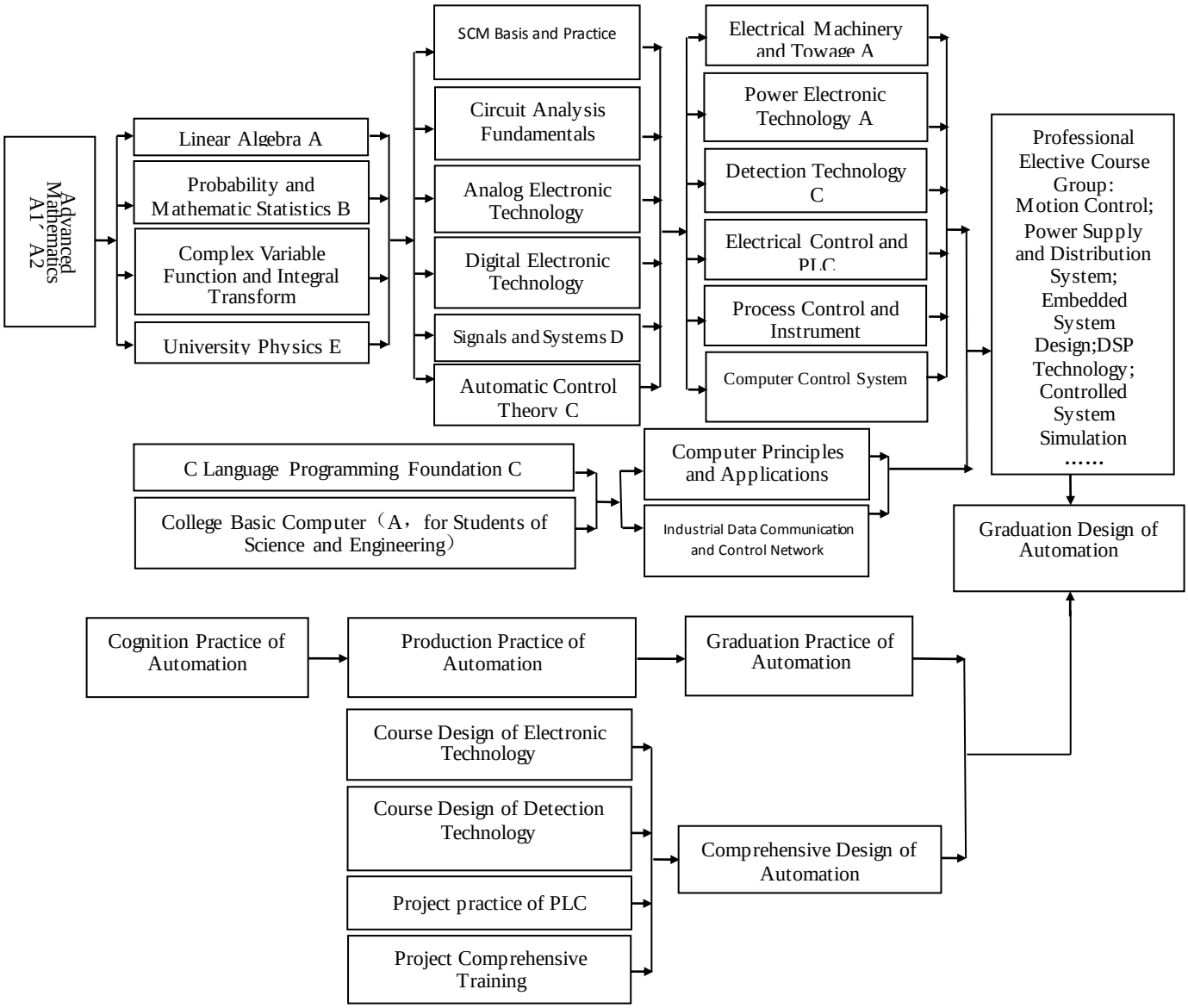
1、“学位课”栏用★标注；“双学位课”栏用▲标注；“辅修课程”栏用◆标注；考核方式栏填写“考试”或“考查”。

2、课程名称后有“☆”的表示该课程是全英文教学课程；课程名称后有“△”的表示该课程是双语教学课程。

八、选课指导（课程配置流程图）



Ⅷ.Guidance for Selecting Courses



九、各学期应修学分分布表

Ⅸ. Credit's Table for each Semester

学期 Semester	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th	学分合计 Total
建议应修学分 Credits	26	26	28	24	22	22	7	15	170

十、说明

选修课的修学计划须在班主任和专业导师指导下完成。

Ⅹ. Instructions

Elective course plan must be formulated under the directions from class adviser and professional supervisor.

*十一、培养标准实现矩阵

*XI. Training standard implementation matrix

毕业要求	指标点	支撑课程
1. 工程知识：能够用科学的语言描述工程问题，并用于自动化系统的设计、制作和优化。	1.1 能够用数学、自然科学的语言对工程问题进行初步描述。	高等数学 A1、高等数学 A2、线性代数 A、概率论与数理统计 B、大学物理
	1.2 能够将工程基础知识应用于信号、电路与电子系统的计算与分析。	电路分析基础 A1、电路分析基础 A2、模拟电子技术、数字电子技术、信号与系统 D
	1.3 能够将专业基础知识应用于自动控制系统的建模、计算与分析。	自动控制理论 C、过程控制与仪表、计算机控制系统、电机与拖动 A
	1.4 能够将检测、驱动、控制、网络通信等专业知识用于自动化系统的设计、制作和优化。	检测技术 C、电力电子技术 A、工业数据通信与控制网络、电气控制及 PLC
2. 问题分析：能够识别和正确表达自动化系统中涉及的电路、信号检测、执行机构等环节，并能根据自动化系统的要求，通过文献调研，得到解决问题的总体思路和方案。	2.1 能够应用数学、自然科学的基本原理，识别电路及电子系统、自动化系统中涉及的电路原理、信号分析等问题。	复变函数与积分变换、电路分析基础 A1、电路分析基础 A2、模拟电子技术、数字电子技术、信号与系统 D
	2.2 能够识别自动控制系统的组成部分并分析各环节的作用，会分析系统性能及其影响因素。	电力电子技术 A、检测技术 C、自动控制理论 C、计算机原理及应用、电机与拖动 A、检测技术课程设计
	2.3 能够根据自动化系统的要求，在文献调研的基础上进行分析，得到解决问题的总体思路和方案。	创新创业实践系列项目、自动化专业综合设计、自动化专业生产实习、自动化专业毕业设计
3. 设计/开发解决方案：能够遵循工程设计流程，合理选择方案，设计出满足特定要求的单元电路和自动化系统，并能够在设计环节中体现创新意识，同时考虑社会、健康、安全、法律、文化以及环境等因素。	3.1 能够根据特定要求，完成单元电路或电子电气系统的设计。	单片机基础与实践、电气控制及 PLC、电子技术课程设计、检测技术课程设计
	3.2 能够根据自动化系统的技术要求，选择合理化解决方案，包括系统方案、器件选型、控制算法选择等。	计算机控制系统、过程控制与仪表、PLC 项目实践
	3.3 能够对系统设计方案的合理性进行论证，根据要求设计出满足性能指标的自动化系统，并在此过程中体现创新意识。	创新思维与方法、项目训练综合、自动化专业综合设计、自动化专业毕业设计
	3.4 能够在设计环节考虑社会、健康、安全、法律、文化和环境等因素。	思想道德修养与法律基础、形势与政策 1-4
4. 研究：能够理解或提出实验目标，基于科学原理设计、实施实验，并对实验结果进行分析，通过信息综合得到合理有效的结论。	4.1 能够理解或提出实验目标，设计并实施实验，对自然科学、电路、电子元器件等相关的物理现象、电气特性进行研究和实验分析。	大学物理实验 C1-C2、电路分析基础实验 A1、电路分析基础实验 A2、模拟电子技术实验、数字电子技术实验、电子技术课程设计
	4.2 基于科学原理并采用科学方法对元部件、自动控制系统、计算机输入输出接口等制订实验方案并实施，以获取实验数据。	自动控制理论 C、电机与拖动 A、检测技术 C、电力电子技术 A、计算机原理与应用实验
	4.3 能够分析和解释实验数据，并通过信息综合得到系统优化等合理有效的结论。	概率论与数理统计 B、过程控制与仪表、计算机控制系统、检测技术课程设计、自动化专业毕业设计
5. 使用现代工具：能够合理选择恰当的技术、资源、编程语言、仿真	5.1 能够理解相关技术、资源、编程工具等的作用、功能，认知其适用场合。	程序设计基础 C（C 语言）、计算机基本技能训练、工业数据通信与控制网络、单片机基础与实践

工具，解决自动化领域的工程问题或者对其进行辅助设计、预测模拟，并能够理解其局限性。	5.2 掌握一门程序设计语言，并能加以利用，以解决自动化领域的实际问题。	程序设计基础 C（C 语言）、大学计算机（理工 A）、计算机原理及应用、单片机基础与实践、电气控制及 PLC
	5.3 能够使用恰当的仿真工具或工程工具对自动化领域中的复杂工程问题进行辅助设计、预测和模拟，并能理解其局限性。	过程控制与仪表、PLC 项目实践、模拟电子技术实验、数字电子技术实验
6. 工程与社会：能够基于工程相关背景知识进行合理分析，评价自动化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 能够认知和解释自动化专业相关的知识产权、产业政策和法律法规，理解不同社会文化的差异。	入学教育、思想道德修养与法律基础、形势与政策 1-4
	6.2 能够理解工程技术人员在专业工程实践和自动化系统中应承担的社会责任；能够评价专业工程实践和自动化系统对社会、健康、安全、法律以及文化的影响。	就业创业基础、创新创业实践系列项目、自动化专业生产实习、自动化专业毕业实习
7. 环境和可持续发展：能够理解和评价自动化专业领域的工程实践对环境、社会可持续发展的影响。	7.1 能够认知环境保护和社会可持续发展的内涵和意义，并在实习、社会实践等项目中践行。	入学教育、就业创业基础、自动化专业认识实习
	7.2 能够评价自动化领域的工程应用对环境、社会可持续发展的影响。	项目综合训练、自动化专业生产实习、自动化专业毕业实习
8. 职业规范：具有人文社会科学素养、社会责任感，能够在自动化专业领域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 具有人文社会科学素养，能够形成正确的世界观、人生观和价值观。	中国近现代史纲要、毛泽东思想与中国特色社会主义理论体系概论、马克思主义基本原理概论
	8.2 具有健康的身体和心理，具备履行社会责任的基础。	体育项目 1-4、体能训练及体质达标测试 1-2、军事理论、大学生心理健康教育
	8.3 能够在自动控制系统中的工程实践中理解并遵守工程职业道德和规范，履行责任。	思想道德修养与法律基础、思想政治理论课实践教学、创新创业实践系列项目、自动化专业认识实习
9. 个人和团队：能够在多学科背景下的团体中承担个体、团队成员以及负责人的角色。	9.1 具备良好的团队协作意识，能够与其他学科成员协作互补。	军事理论、军事技能训练、工程训练 D、思想政治理论课实践教学
	9.2 能够独立完成团队分配的工作，胜任团队成员的角色，组织团队成员开展工作。	工程训练 D、PLC 项目实践、项目综合训练、自动化专业综合设计、自动化专业毕业实习
10. 沟通：能够就自动化专业领域的复杂工程问题与同行及公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。能够在跨文化背景下进行沟通和交流。	10.1 能够就自动化领域的复杂工程问题，通过文稿、图表、口头表达等方式进行表达，回应质疑，与业界同行及社会公众进行有效沟通和交流。	PLC 项目实践、检测技术课程设计、电子技术课程设计、项目训练综合、自动化专业毕业设计
	10.2 能够阅读外文文献资料，在跨文化背景下进行沟通和交流，具备一定的国际视野。	综合外语 1-4
11. 项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。	11.1 理解自动化领域工程活动涉及的重要经济与管理因素。	经济管理概论、工程训练 D、自动化专业生产实习
	11.2 具备在多学科环境中对工程问题进行经济分析、决策和管理的能力。	经济管理概论、就业创业基础、自动化专业综合设计、自动化专业毕业设计

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 能认识不断探索和学习的必要性，具备自主学习和终身学习的意识。	马克思主义基本原理概论、毛泽东思想与中国特色社会主义理论体系概论、自动化专业认识实习
	12.2 能够通过学习不断提高，适应工程技术的发展，适应社会竞争与合作。	电子技术课程设计、自动化专业毕业实习、自动化专业毕业设计