

廣東工業大學

Guangdong University of Technology



信息工程学院

信息工程专业 2014（修订版）

人才培养方案

自 2016 级开始执行

信息工程

Information Engineering

学制：四年

Length of Schooling: Four Years

学位：工学学士

Degree: Bachelor Degree of Engineering

制订时间：2016 年 3 月

Time of Formulation: Mar 2016

一、培养目标

培养学生全面掌握信息获取、传输、处理以及应用方面的基础理论和相关技术，侧重于图像、音/视频信号处理技术及软件设计；具有良好道德文化素养和社会责任感；掌握扎实的数学、自然科学基础知识和专业知识；具备良好的学习能力、实践能力、专业能力和创新意识；具备良好的沟通能力、团队合作精神和开阔的国际视野；能在信息及相關领域从事科研、开发和管理等工作的高素质、宽口径和复合型高级工程技术人才。

The objective of Information Engineering is to make the students master the theories and technologies on information acquisition, transmission, processing, and applications, especially on image, audio/video processing and the software design, possess good morals and social responsibility, know well the fundamental knowledge on mathematics and natural science, have good capabilities on learning, practicing and innovative consciousness, are provided with good communication skills, team cooperation and global outlook, and become well-trained practitioners being engaged in the research, development, design, integration, management in the related fields of information technology.

二、毕业要求

1. **工程知识：**具有从事信息工程所需的扎实的数学、自然科学、工程基础和专业知识，并能够综合应用这些知识解决信息工程领域复杂工程问题。

Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problem.

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

研究分析信息工程领域复杂工程问题，以获得有效结论。

Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. **设计/开发解决方案：**能够综合运用理论和技术手段，设计针对信息工程领域复杂工程问题的解决方案，设计满足信息获取、传输、处理或使用等需求的系统、单元（部件）或工艺流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

Design solutions for complex engineering problems and design systems components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. **研究：**能够基于科学原理并采用科学方法对信息工程领域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。

Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. **使用现代工具：**能够针对信息工程领域复杂工程问题，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，包括对信息工程领域复杂工程问题的预测与模拟，并能够理解其局限性。

Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations.

6. **工程与社会：**能够基于信息工程相关背景知识进行合理分析，评价专业工程实践和信息工程领域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。

Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

7. **环境和可持续发展：**能够理解和评价针对信息工程领域复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

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

Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

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

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

10. **沟通:** 能够就信息工程领域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。

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

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

Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **终身学习:** 具有自主学习和终身学习的意识,有不断学习和适应力。

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.

三、专业培养特色

专业特色:

侧重信息处理及相关的信息系统集成、开发、计算机模拟和应用,重点是对图像、语音和视频信号的处理及应用。

培养方案的特色:

按一级学科口径设置专业基础平台;为了提高学生的计算机和外语能力,本专业学生每学年都有相关的逐步提高的课程,做到四年不中断;培养学生掌握一定的硬件设计能力,重

点培养学生掌握信号信息处理技术和软件设计能力。依托“广东省教育厅现代信息技术重点实验室”，加强实践教学，提高了综合性、设计性实验在学生实验中的比重；加强第二课堂教学、工程训练和课程设计，加强教学与科研相结合；将信息学科的前沿技术引入教学中，注重新知识传授。结合学科优势，开设信号与系统、数字信号处理、信息论、信号检测与估值、数字图像处理、计算机图形学、人工智能、语音信号处理、视频信号处理和自适应信号处理等专业课程。

III Characteristics of the specialty education

Specialty Traits:

It place emphasis on information processing and development of the corresponding information system, especially on the processing and applications in image, audio and video signals

Training Program Traits:

Set professional basis platform according to the first level discipline. In every academic year, some step by step courses are set to improve the computer and foreign language ability of our student. Pay attention to the training of both soft and hardware design. Relying on Key Laboratory of Modern Information Technology of Guangdong Province Department of Education, the proportion of designing and comprehensive experiments has been increased.

Strengthen the extracurricular teaching, project training and course design. Strengthen the combination of teaching and research. Introduce the front technology of information science into the teaching and focus on the teaching of new knowledge. Utilizing the discipline advantage, we offer the feature course learning, such as digital image processing, embedded system, information theory, audio signal processing and artificial intelligence.

四、专业主干学科

信息与通信工程，信号信息处理。

IV Main discipline for the specialty

Information and communication engineering, signal and information processing

五、专业核心课程

信号与系统、数字信号处理、数字图象处理、信息论基础、信号检测与估值。

V Core courses of the specialty

Circuit, Signal and System, Analog Electronic Technology, Digital Electronic Technology, C Language Programming, Digital Signal Processing, High Frequency Circuit, Microcomputer Principle and Applications, Object-Oriented Programming, Computer Network, SCM Theory and Interface Technology, Digital Image Processing.

六、双语课程

数字图象处理。

VI Bilingual courses

Digital Image Processing

七、毕业学分要求

毕业总学分不低于 170.0 学分，其中实践环节不低于 35.0 学分。

VII Credits required for graduation

The total credits required for graduation is at least 170.0, including more than 35.0 credits of practice link.

八、主要实践教学环节

模拟电子技术实验、数字电子技术实验、微处理器与接口技术实验、电路实验、信号与系统仿真实验、数字通信原理实验；数字图像处理课程设计、EDA 技术课程设计、DSP 原理与应用课程设计、嵌入式系统课程设计、数字信号处理课程设计、面向对象程序课程设计、数据库原理课程设计、网络编程课程设计；电子工艺实习、生产实习、电子线路 CAD 设计、毕业设计等。

VIII Main components of practical teaching

Analog Electronic Technology Experiments, Digital Electronic Technology Experiments, Microprocessor and Interface Technology Experiments, Circuit Experiments, Signal and System Simulation Experiments, Digital Communication Theory Experiments, Digital Image Processing Course Design, EDA Technology Course Design, DSP Principle and Applications Course Design, Embedded System Course Design, Digital Signal Processing Course Design, Object-Oriented Programming Course Design, Database Principles Course Design, Network Programming Course Design, Electronic Process Practice, Production Practice, ElectronTransmission Line CAD Design, Graduation Project

九、课程体系的构成及课程学分分配比例

1、课内部分

课程类别		内容说明	总学分	总学时	占总学分比例	小计
必修 Compulsory courses	公共基础课 Basic public courses	含“思想政治理论课”、体育、大学英语、高等数学、大学物理、计算机文化基础等。 Courses such as Ideological & Political Theories, University Physical Education, College English, Advanced Mathematics, Basic Computer Literary.	65.0	1040	38.2%	67.0%
	专业基础课 Basic specialty courses	构筑专业基础平台的基本概念、理论和基础知识的课程。 Courses for constructing the basic concepts, theories and knowledge underlying the specialty.	39.0	624	22.9%	
	专业课 Specialty courses	构筑专业方向的概念、理论和知识的课程。 Courses for constructing concepts, theories and knowledge of the specialty emphasis.	10.0	160	5.9%	
	实验实习实训 Experimental and practical courses		14.0	224	8.2%	20%

	设计（论文） Graduation design (thesis)		20.0	320	11.8%	
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课程类别		内容说明	总学分	总学时	占总学分比例	小计
选修 Elective courses	全校性公共课(至少选 12.0 学分) Universitywide public courses (A minimum of 12.0 credits required)	指人文社科类、自然科学与工 程技术类全校性公选课。 Universitywide public elective courses in humanities and social sciences, natural sciences, and engineering.	12.0	192	7.1%	11.8%
	专业基础课 (至少选 0 学分) Basic specialty courses (A minimum of ? credits required)	指相关学科和跨学科的基础 理论和知识的课程。 Courses for basic theories and knowledge in the main discipline and related disciplines.	0	0	0	
	专业课 (至少选 8.0 学分) Specialty courses (A minimum of 8 credits required)	指学科方向和跨学科方向的 基础理论和知识的课程。 Courses for basic theories and knowledge in the disciplinary emphasis and interdisciplinary emphasis.	8.0	128	4.7%	
	实验实习实训 (至少选 0 学分) Experimental and practical courses (A minimum of? credits required)		0	0	0	1.2%
	设计（论文） Graduation design (thesis)		2.0	32	1.2%	
合计 Total			170.0	2720		100%

注：全校性公共课要求学生必选：工程管理、工程伦理两门课。

2、课外部分 Extra-curricular sector

课程类别 Category		课程名称 Course name	学分 Credits	总学时 Total teaching hours	实验学时 Teaching hours for Experiments	实习实训学时 Teaching hours for practice	上机学时 Teaching hours with computers
必修 Compulsory part	公共教育类 Public education	入学教育 Entrance education	0.5	0.5 周			
		公益活动 Social work	1.0	16			
		社会实践 Social practice	2.0	32			
		“毛泽东思想、邓小平理论和‘三个代表’重要思想概论” 课外导读 Extra-curricular guided reading of An Introduction to Mao Tsedung Thoughts, Deng Xiaoping Theory and the Important Thoughts of “Three Represents”	1.0	16			
	专业教育类 Specialty education	毕业教育 Graduation education	0.5	0.5 周			
小计 Subtotal			5.0				

	课外活动名称 Extra-curricular activities	课外活动和社会实践的要求 Requirements for extra-curricular activity and social practice		课外学分 Extra-curricular credits
选修 Elective part	英语及计算机考试 English and computer tests	全国大学英语六级考试 National College English Test (CET) 6	考试成绩达到学校要求者 Meeting score requirement of the university	2
		全国计算机等级考试 National Computer Rank Examination (NCRE)	获二级以上证书者 Granted certificate of or above Level 2	2
		全国计算机软件资格、水平考试 National computer software qualification and proficiency tests	获程序员证书者 Granted programmer's certificate	2
			获高级程序员证书者 Granted advanced programmer's certificate	3
			获系统分析员证书者 Granted system analyst's certificate	4
		行业资格考试 Professional qualification tests	参加全国行业资格统考 Nationwide uniform professional qualification tests	获行业资格证书者 Granted professional qualification certificate
	竞赛 Contests	校级 University level	获一等奖者 Awarded first prize	2
			获二等奖者 Awarded second prize	1
			获三等奖者 Awarded third prize	0.5
		省级 Provincial level	获一等奖者 Awarded first prize	3
获二等奖者 Awarded second prize			2	
获三等奖者 Awarded third prize			1	
全国 National level		获一等奖者 Awarded first prize	5	
		获二等奖者 Awarded second prize	4	

			获三等奖者	3
	系列讲座 Serial lectures	参加学校组织的系列讲座 Attending serial lectures held on the campus	参加累计 4 场次以上 Attending a minimum of 4 lectures	1
	论文 Academic papers	在全国性一般刊物发表论文 Having papers published in nationwide average journals	每篇论文 Per paper	1
		核心刊物发表论文 Having papers published in nationwide key journals	每篇论文 Per paper	2
	课外科技创新活动 Extra-curricular scientific and technological innovation activities	参与课外科技创新活动 Participating extra-curricular scientific and technological innovation activities	每项 Per event	1

十、课程设置及学时（学分）分配

1、课内部分

课程类别 Course category	课程名称 Course name	学分 credits	总学时 Total teaching hours	实验学时 Teaching hours for Experiments	实习实训学时 Teaching hours for practice	上机学时 Teaching hours with computers	开课学期 semester
必修 Compulsory courses	中国近现代史纲要 Conspectus of Chinese Modern History	2.0	32				1
	思想道德修养与法律基础 Cultivation of Ethic Thought & Fundamentals of Law	3.0	48				2
	廉洁修身 Honesty and Moral Cultivation	1.0	16				2
	马克思主义基本原理 Basic principles of Marxism	3.0	48				3
	毛泽东思想、邓小平理论和“三个代表”重要思想概论 Mao Zedong Thought and Deng Xiaoping Theory and the Important	5.0	80				4

		Thought of Three Represents of a Survey						
		形势与政策 situation and policy	2.0	32				6
		体育 Physical training	8.0	128				1-4
		高等数学 A Advanced Mathematics A	11.0	176				1-2
		大学物理 A University Physics A	8.0	128				2-3
		大学英语 College English	16.0	256		64		1-4
		军事理论 Military Theory	2.0	32				1
		大学生心理健康教育 Mental Health Education of College Students	1.5	24				1
		大学生职业规划与创业教育 College Students' Career Planning and Entrepreneurship Education	1.0	16	8			1
		大学生就业创业指导 College Students Employment and Entrepreneurship Guidance	1.5	24	16			6
		小 计 Subtotal	65	1040	24	64		
	专业 基础 课 Basic speci alty cour ses	数据结构与高级语言程序设计 Data Structure and Advanced Language Programming	3.0	48	\		16	3
		电路 Circuit	3.0	48				2
		复变函数与积分变换 Functions of Complex Variables and Integral Transformations	3.0	48				3
		概率论与数理统计 C Probability & Statistics C	2.5	40				4
		模拟电子技术 A Analog Electronics A	3.5	56				3
		EDA 技术 EDA Technology	3.0	48	6			5
		数字电子技术 Digital Electronics	2.5	40				4
		数字通信原理 Principle of Digital Communication	2.5	40				5
		数字信号处理	3.0	48				5

		Digital Signal Processing						
		Matlab 编程及应用 MATLAB Programming and Application	1.0	16				1
		线性代数 Linear Algebra	2.0	32				1
		信号与系统 Signal and System	4.0	64				4
		专业导论 An Introduction to Speciality	1.0	16				1
		信息论基础 Information Theory	2.0	32				4
		电磁场理论与微波技术 Theory of electromagnetic field and microwave technology	2.0	32				6
		专业英语 Special English	1.0	16				5
		小 计 Subtotal	39.0	624	6		16	
	专业 课 Spec ialty cour ses	数字图像处理 Digital Image Processing	3.0	48			6	5
		信号检测与估值 Signal Detection and Estimation	2.0	32				6
		计算机图形学 Computer Graphics	2.0	32			6	6
		微处理器与接口技术 Microprocessor and Interface Technique	3.0	48				6
		小 计 Subtotal	10.0	160			12	
必修 Com puls ory cour ses	实验 实习 实训 Expe rime ntal and prac tical cour ses	军训 Military Training	2.0	2 周			32	1
		电子工艺实习 Electronic Technique Practice	1.0	1 周			16	4
		工程训练 Engineering Training	1.0	1 周			16	5
		电路实验 Experiment of Circuit	1.0	16	16			2
		大学物理实验 A University Physical Experiments A	3.0	48	48			2-3
		模拟电子技术实验 A Experiment of Analog Electronics A	1.5	24	24			3

		信号与系统仿真实验 Simulation experiment of Signal and System	0.5	8	8			4
		数字电子技术实验 Experiment of Digital Electronics	1.0	16	16			4
		微处理器与接口技术实验 Experiment of Microprocessor and Interface Technique	0.5	8	8			6
		生产实习 Production Internship	2.0	2 周		32		8
		数字通信原理实验 Experiment of Principle of Digital Communication	0.5	8	8			5
		小 计 Subtotal	14.0	224	128	96		
	设计 (论 文) Grad uati on desi gn (thes is)	电子线路 CAD 设计 CAD of Electronics	1.0	1 周			16	4
		数字图像处理课程设计 Course Design of Digital Image Processing	1.0	1 周			16	5
		数字信号处理课程设计 Course Design of Digital Signal Processing	1.0	1 周			16	5
		信息系统综合设计 Combined Design of Information System	4.0	4 周		64		7
		毕业设计 (论文) Graduation Design (Thesis)	13.0	13 周				8
		小 计 Subtotal	20.0	20 周		64	48	
选 修 Elec tive cour ses	全校 性公 共课 Univ ersit y wide publi c cour ses	自然科学与工程技术类 The natural sciences and engineering technology	9.0	144				自选
		人文社科类 Humanities and Social Sciences	3.0	48				自选
		小计 (至少选 12.0 学分) Subtotal(A minimum of 12.0 credits required)	12.0	192				
	专业 课	DSP 原理与应用 Principle and Application of DSP	2.5	40	6			6

Specialty courses	面向对象程序设计 Object Oriented Programming	2.5	40			6	5
	嵌入式系统 Embedded System	2.5	40	6			7
	数据库原理及应用 A Principle and Application of Database A	2.5	40			6	5
	网络编程 Computer Networking Programming	2.0	32			6	6
	计算机网络 C Computer Network C	2.5	40	8			6
	音视频信号处理与系统 Audio and Video Signal Processing and System	2.0	32				6
	模式识别 Pattern Recognition	2.0	32				7
	统计与自适应信号处理 Statistical and Adaptive Signal Processing	2.0	32				6
	最优信号处理 Optimal Signal Processing	2.0	32				7
	机器学习与人工智能 Machine Learning and Artificial Intelligence	2.0	32				7
	虚拟现实技术 Virtual Reality Technology	2.0	32				6
	信息安全理论与技术 Information Security Theory and Technology	2.0	32				7
	数据挖掘与融合技术 Data mining and fusion technology	2.0	32				5
	工程伦理 Engineering ethics	1.0	16				7
	工程管理 Engineering Management	1.0	16				7
	小计（至少选 8.0 学分） Subtotal(A minimum of 8.0 credits required)	8.0	128	20		18	
设计（论	EDA 技术课程设计 Project of EDA	1.0	1 周	16			5
	DSP 原理与应用课程设计 Project of DSP	1.0	1 周	16			6

文) Grad uati on desi gn (thes is)	嵌入式系统课程设计 Project of Embedded System	1.0	1 周	16			7
	面向对象程序课程设计 Course Design of Object Oriented Programming	1.0	1 周			16	5
	数据库原理课程设计 Course Design of Database	1.0	1 周			16	5
	网络编程课程设计 Project of Computer Networks Programming	1.0	1 周			16	6
	小计 (至少选 2.0 学分) Subtotal(A minimum of 2.0 credits required)	2.0	2 周				