Electronic Information Engineering

(Grade 2022)

Course code: 080701

I. Cultivation Objectives

1. General cultivation objective

This program cultivates builders of the new era with comprehensive development of morality, intellect, physique, aesthetics and labor, who have a wide range of employment, focus on practice and emphasize innovation. Students mainly learn the basic theory and basic knowledge of signal acquisition and processing, electronic equipment and information systems, etc., while receiving basic training of various electronic and information engineering practice. Students will be trained to have good scientific quality, strong ability to update knowledge and wide range of engineering adaptability, and be able to engage in research, design, application, development, management and technical service of various electronic equipment and information systems.

2. Objective of value guidance

The Program of Electronic Information Engineering cultivates students with a strong sense of social responsibility, selfless dedication and good integrity by taking the spirit of patriotism, model worker and craftsmanship as the value leader and the cultivation and education of core competency and teaching activities as the carrier. The major takes " building moral and cultivating people" as the central part of education, and teaches engineers' values and engineering ethics in practice through the spirit of craftsmanship, so as to cultivate students into builders of the new era who have a rigorous, meticulous and responsible working attitude, a refined and perfect working concept, a mastery of high skills, and are diligent in thinking, good at research, brave in innovation, and master the planning, design and implementation of new electronic systems.

3. Five years after graduation, students in this program should achieve the following objectives:

(1) Have sense of social responsibility and good professional ethics, be able to integrate the impact of legal, environmental, social, cultural and sustainable development factors in their engineering practice.

(2) Master the relevant standards, specifications and protocols in the field of Electronic Information Engineering, be able to follow the cutting-edge technologies in the field, having the ability to innovate in theory and engineering, and the ability to apply new technologies to engineering practice.

(3) Have extensive professional and technical work experience, and be able to apply basic knowledge of engineering mathematics and science and professional knowledge in the field of Electronic Information Engineering to solve complex engineering problems in fields related to the design and integration of electronic information systems.

(4) Master a healthy body and mind and good humanities and scientific qualities, have team spirit, good communication, coordination, cooperation, competition and engineering Project Management skills, and grow into the core and high-level talents of the industry.

(5) Be able to communicate internationally with international counterparts using a foreign language. Be able to proactively adapt to changing domestic and international scientific and technological developments, develop the habit of independent and lifelong learning, and continuously increase their knowledge base and enhance their abilities.

II. Graduation requirements

1.Engineering knowledge: Be able to combine mathematical, natural science, electronic engineering fundamentals, professional fundamentals and professional knowledge for solving complex engineering problems in the field of Electronic Information Engineering.

1-1: Be able to use the language tools of mathematics, natural science and engineering science to formulate engineering problems in their field of profession.

1-2: Be able to develop suitable mathematical models and solve them for specific objects of study.

1-3: Be able to apply relevant knowledge and mathematical modelling methods to derive and analyse professional engineering problems in electronic information.

2.Analysis of the Problem: Have knowledge of analytical methods commonly used in the field of Electronic Information Engineering, the ability to apply basic principles of mathematics, natural sciences and electronic information science to identify, represent, and analyse complex engineering problems in the field of electronic information through literature research in order to reach valid conclusions.

2-1: Be able to apply the fundamental principles of mathematics, natural and engineering sciences to accurately identify and identify critical problems in complex engineering in the field of Electronic Information Engineering.

2-2: Be able to correctly represent complex engineering problems in the field of electronic information based on relevant scientific principles and mathematical modelling methods.

2-3: Be able to recognize that there are multiple options available for solving problems, be familiar with search channels for information related to the electronic information profession, and be able to use literature and information resources to analyse topics, evaluate search results, seek viable solutions and obtain valid conclusions.

3.Design/develop of solutions: Have the ability to design systems, hardware and software units (modules) or processes that meet the targets and requirements for specific needs, and to demonstrate a sense of innovation in the design process, taking into account social, health, safety, legal, cultural and environmental factors. Have the ability to design project solutions independently**.**

3-1: Have knowledge of basic design/development methods, techniques and language tools for the full cycle and full process of engineering design and product development in the field of electronic information, and understanding of the factors that influence design objectives and technical solutions.

3-2: Be able to complete the design of hardware and software units (modules) for the specific needs of Electronic Information Engineering field.

3-3: Be able to design a system or process in the field of Electronic Information Engineering and gain the ability to be creative and demonstrate a sense of innovation in the design.

3-4: Be able to integrate the impact of social, health, safety, legal, cultural and environmental constraints in design.

4.Research: Have the ability to use scientific principles and methods to study electronic information systems and software and hardware modules, and to design experimental solutions and obtain experimental data for complex engineering problems in Electronic Information Engineering. Be able to analyse and interpret experimental results and synthesize information to reach reasonable and valid conclusions.

4-1: Be able to analyse solutions to complex engineering problems in their field of profession and investigate the scientific issues involved, based on scientific principles and through literature research and related methods.

4-2: Be able to choose a route of research and design experimental programs for simulation and hardware based on the characteristics of the object.

4-3: Be able to construct experimental systems or platforms according to experimental protocols, carry out

experiments safely and collect experimental data correctly.

4-4: Be able to analyse and synthesize collected experimental data, make analyses and interpretations of experimental results and draw reasonable and valid conclusions.

5.Use of modern tools: Be able to develop and use a variety of electronic test-related instrumentation and equipment, and select and use a variety of simulation software for complex engineering problems in the field of electronic information.

5-1: Be familiar with the use of modern instrumentation, information technology tools, engineering tools and simulation software commonly used in Electronic Information Engineering.

5-2: Be able to select and use appropriate techniques, resources, modern instrumentation, information technology tools, engineering tools and professional simulation software to analyse, calculate and design complex engineering problems in the field of Electronic Information Engineering.

5-3: Be able to learn and select modern tools and simulation software that meet specific needs in order to simulate and predict professional problems, and be able to understand and analyse their limitations.

6.Engineering and Society: Understand basic engineering design methods, processes and implementation specifications, and be able to carry out sound analysis based on background knowledge of Electronic Information Engineering and evaluate the social, health, safety, legal and cultural impacts of engineering practices and solutions to complex engineering problems in the electronic information profession, and understand the responsibilities involved.

6-1: Understand the technical standards system, intellectual property rights, industrial policies and laws and regulations in fields related to Electronic Information Engineering and understand the impacts of different socio-cultural contexts on engineering activities.

6-2: Be able to analyse and evaluate the social, health, safety, legal and cultural impacts of Electronic Information Engineering engineering practices and solutions to complex engineering problems, and the impacts of these constraints on project implementation, and understand the possible consequences and responsibilities that may arise from engineering activities.

7.Environment and Sustainable Development: Understand the meaning and significance of environmental and social sustainable development. Understand the basic guidelines, policies, laws and regulations on environmental and social sustainable development, and understand the impact of engineering practice on environmental and social sustainable development in the complex engineering problems in the field of electronic information.

7-1: Know and understand the concept and meaning of environmental protection and sustainable development, and have an consciousnesses of environmental protection and sustainable development.

7-2: Be able to consider the sustainability of professional engineering practice in the context of environmental protection and sustainable development, evaluating the potential hazards and possible damage to humans and the environment during the product cycle.

8.Professional Codes: Have knowledge of humanities and social science literacy, social responsibility, and the ability to understand and comply with engineering ethics and codes of practice and responsibilities in the practice of Electronic Information Engineering.

8-1 Have a firm and correct political stance and viewpoint, a scientific perspective on the world, life and values, patriotism and an understanding of China's national conditions; have a healthy psychological quality, a correct self-understanding, good emotional management skills, the ability to deal rationally with conflicts in life, work and study, and an understanding of the relationship between the individual and society.

8-2: Master a sense of integrity-based thinking and an understanding of the engineering ethics and codes of

honesty and fairness and integrity, and be able to consciously observe them in engineering practice.

8-3: Understand the engineer's responsibility for the safety, health and well-being of the public and for the protection of the environment, and be conscious of their responsibilities in engineering practice.

9.Individual and team: Have the ability to take on the role of individual, team member and leader in a multidisciplinary team context. Have knowledge of Project Management protocols and project implementation processes.

9-1: Have good interpersonal skills, a strong sense of cooperation and the ability to communicate effectively and work cooperatively with members of other disciplines.

9-2: Be a coordinated and collaborative team player who is able to work independently or cooperatively in a team.

9-3: Demonstrated organizational leadership skills with the ability to organize, coordinate and direct the work of a team.

10.Communication: The ability to communicate effectively with industry peers and the public on complex engineering issues in the field of electronic information, and to communicate in a cross-cultural context.

10-1: Be able to use language and writing proficiently to express their views and opinions clearly in oral, script, diagram and report formats on professional issues in the field of electronic information, respond to instructions and queries, communicate and interact effectively with industry peers and the public, and understand the differences in communication with industry peers and the public.

10-2: Understand the channels for discovering the frontiers of disciplinary knowledge in their field of specialization, be aware of international trends and research hotspots in their field of specialization, and understand and respect the differences and diversity of different cultures around the world.

10-3: Demonstrated verbal and written skills in intercultural communication and the ability to communicate and interact in a basic intercultural context on issues in the field.

11.Project Management: Understand and master the principles of engineering management and economic decision-making methods related to electronic information, and apply them in a multidisciplinary environment.

11-1: Have knowledge of engineering management and economic decision-making methods involved in engineering projects in this professional field.

11-2: Master cost consciousnesses and profit concepts, understand the cost components of the full cycle and full process of engineering and products, and understand the engineering management and economic decision-making issues involved.

11-3: Be able to apply engineering management and economic decision-making methods in the design and development of solutions in a multidisciplinary environment (including simulation).

12.Spirit and ability of lifelong learning: Have consciousnesses of independent learning and lifelong learning, master the basic methods and approaches to follow the frontiers and development trends of electronic information. Be able to learn, self-improve and adapt to the needs of personal and professional development.

12-1: Be able to recognize the need for independent and lifelong learning in the context of social development, keep abreast of technological advances, have a sense of crisis and have a philosophy of lifelong learning.

12-2: Master a scientific approach to learning and the ability to learn independently, including the ability to understand technical issues, to summarize and to ask questions, etc.

III. Schooling System

Four years.

IV. Length of Study

Flexible study period, generally four years, the minimum length of flexibility is not less than three years, the

longest not more than six years.

V. Requirements for Graduation and Degree Conferring

In order to graduate, students must complete the minimum number of credits required by the Instructive Cultivation Plan for each course category and all the content required by the Extracurricular Class, with a total of 165 credits, and will be awarded a Bachelor of Engineering degree if they meet the requirements for the award of a Bachelor's degree.

VI. Discipline

Electronic Science and Technology, Information and Communication Engineering, Computer Science and Technology.

VII. Core Courses

Fundamentals of Programming, Fundamentals of Circuit Analysis, Analog Electronic Technology, Digital Electronic Technology, Signal and System, Electromagnetic Field and Electromagnetic Waves, Digital Signal Processing, Principles of Communication, Fundamentals of Information Theory, RF Electronic Circuits, Principles and Applications of Microcontrollers, Embedded Systems and Its Applications, Simulation Practice for Circuit Design, Automotive Embedded Systems, Signal and Information Processing.

VIII. Course Structure and Course Hours (excluding Extracurricular Class)

Category	**Total Credit**	**%**	**Total Course Hours**	**Theory Learning**	**Practical Training**
Public Fundamental Course	57.5	35	1056	976	80
General Education	10	6	160	160	0
Engineering Fundamental Course	15	9	240	166	74
Professional Fundamental Course	23	14	368	308	60
Professional Course	35	21	560	414	146
Professional Practice	23.5	15	712	0	712
Total	16 4	100	3096	2024	1072
Theory: **Practical** (%)	65: 35				

IX. Teaching schedule (1)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Public Fundamental Course	required	School of Marxism	b1080001	Basic Principles of Marxism	test	3	48	42	6	Spring 1
	required	School of Marxism	b1080009	Ethics and the Rule of Law	non-test	3	48	42	6	Spring 1
	required	School of Marxism	b1080006	Outline of Modern Chinese History	non-test	3	48	42	6	Autumn 1
	required	School of Marxism	b1080004	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics I	test	3	48	42	6	Autumn 2
	required	School of Marxism	b1080007	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics II	test	2	32	28	4	Spring 2
	required	School of Marxism	-----	Situation and Policy (Modules 1 to 4)	non-test	2	32	28	4	Autumn 1 to Spring 2
	required	School of Marxism	b1080008	Labour Education A	non-test	0.5	16	16		Autumn 2
	required	College of Arts and Sciences	b1020112	Advanced Mathematics D1	test	5	80	80		Autumn 1
	required	College of Arts and Sciences	b1020113	Advanced Mathematics D2	test	5	80	80		Spring 1
	required	College of Arts and Sciences	b1020063	Academic Physics A (Module 2)	test	3	48	48		Spring 1
	required	College of Arts and Sciences	b1020065	Academic Physics B	test	2	32	32		Autumn 2
	required	College of Arts and Sciences	b1020111	Academic Physics C	non-test	2	32	0	32	Autumn 2
	required	College of Arts and Sciences	b1020108	Linear Algebra	test	3	48	48		Spring 1
	required	College of Arts and Sciences	b1020114	Probability Theory and Mathematical Statistics	test	3	48	48		Autumn 2
	required	College of Arts and Sciences	b1020018	Academic Chinese	non-test	2	32	32		Spring 2
	required	College of Physical Education	-----	Physical Education I to VI	non-test	3	160	160		Autumn 1 to Autumn 4
	required	Others	b1110004	Mental Health Education for University Students	non-test	2	32	16	16	Spring 1
	required	Others	b1110003	Military skills	non-test	0.5	0	0		Autumn 1
	required	College of Arts and Sciences	b1110002	Military theory	non-test	0.5	32	32		Autumn 2
	★ Academic English (Select 1 Module for 10 Credits)	Module A	b1020003	General English III	test	3	48	48		Autumn 1
			b1020004	General English IV	test	3	48	48		Spring 1
			b1020005	Academic English A	test	2	32	32		Autumn 2
			---	Foreign Language Expansion	non-test	2	32	32		Spring 2
		Module B	b1020002	General English II	test	3	48	48		Autumn 1
			b1020003	General English III	test	3	48	48		Spring 1
			b1020006	Academic English B	test	2	32	32		Autumn 2
			---	Foreign Language Expansion	non-test	2	32	32		Spring 2
		Module C	b1020001	General English I	test	4	64	64		Autumn 1
			b1020002	General English II	test	3	48	48		Spring 1
			b1020003	General English III	test	3	48	48		Autumn 2
	★ Academic German	College of Arts and Sciences	b1020040	Academic German I	test	3	48	48		Autumn 1
		College of Arts and Sciences	b1020041	Academic German II	test	3	48	48		Spring 1
		College of Arts and Sciences	b1020042	Academic German III	test	4	64	64		Autumn 2
	★ Academic Japanese	College of Arts and Sciences	b1020077	Academic Japanese I	test	3	48	48		Autumn 1
		College of Arts and Sciences	b1020078	Academic Japanese II	test	3	48	48		Spring 1
		College of Arts and Sciences	b1020079	Academic Japanese III	test	4	64	64		Autumn 2
Subtotal (Public Fundamental Course)						**57.5**	**1056**	**976**	**80**	
General Education	selective	Art Education Center	b0-----	Aesthetic Education	non-test	2	32	32		Autumn, Spring
	selective	Each College	b0-----	Social Sciences and Humanistic Qualities	non-test	4	64	64		Autumn, Spring
				Natural Sciences and Technology Innovation	non-test	4	64	64		Autumn, Spring
Subtotal(General Education)						**10**	**160**	**160**		

(★Note: The first foreign language is 10 credits in total, including 3 languages: Academic English, Academic German and Academic Japanese, choose the appropriate language as required; When Academic English is chosen, please choose the appropriate module in Module A, B, C)

IX. Teaching schedule (2)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Engineering Fundamental Course	required	Engineering Training	b2090011	Fundamentals of Circuit Analysis	test	4	64	52	12	Autumn 1
	required	Engineering Training	b2012061	Analog Electronic Technology	test	4	64	48	16	Spring 1
	required	Engineering Training	b2011123	Digital Electronic Technology	test	4	64	48	16	Autumn 2
	required	School of Computer and Information Engineering	b2012314	Printed board design and signal integrity analysis	non-test	3	48	18	30	Spring 2
subtotal (Engineering Fundamental Course)						**15**	**240**	**166**	**74**	
Professional Fundamental Course	required	School of Computer and Information Engineering	b2012175	Introduction to the Program of Electronic Information Engineering	non-test	1	16	16	0	Autumn 1
	required	School of Computer and Information Engineering	b2012018	Fundamentals of Programming	test	4	64	48	16	Autumn 1
	required	School of Computer and Information Engineering	b2012231	Data Structures and Algorithms	test	4	64	56	8	Spring 1
	required	School of Arts and Sciences	b1020100	Functions of complex variables and integral transformations	test	3	48	48	0	Autumn 2
	required	School of Computer and Information Engineering	b2012131	Foundations of Information Theory	test	2	32	32	0	Spring 2
	required	School of Computer and Information Engineering	b2012129	Signal and System	test	3	48	36	12	Spring 2
	required	School of Computer and Information Engineering	b2012103	Digital Signal Processing	test	3	48	36	12	Autumn 3
	required	School of Computer and Information Engineering	b2012109	Communication principles	test	3	48	36	12	Spring 3
subtotal (Professional Fundamental Course)						**23**	**368**	**308**	**60**	
Professional Course	required	School of Computer and Information Engineering	b2012315	Microcontroller Principles and Applications	test	5	80	50	30	Autumn 2
	required	School of Computer and Information Engineering	b2012022	Electromagnetic fields and electromagnetic waves	test	2	32	32	0	Spring 2
	required	School of Computer and Information Engineering	b2012318	Sensor and microcomputer interface technology	test	4	64	40	24	Spring 2
	required	School of Computer and Information Engineering	b2012066	Embedded Systems and Its Applications	test	3	48	36	12	Spring 2
	required	School of Computer and Information Engineering	b2012249	RF electronic circuits	test	2	32	24	8	Autumn 3
	required	School of Computer and Information Engineering	b2012245	Automotive electronics	test	3	48	36	12	Autumn 3
	required	School of Computer and Information Engineering	b2012244	Automotive Embedded Operating Systems	test	3	48	36	12	Autumn 3
	required	School of Computer and Information Engineering	b2012101	Digital image processing	non-test	2	32	24	8	Spring 3
	required	School of Computer and Information Engineering	b2012316	Electronic Product Development and Management	test	2	32	32	0	Autumn 4
	required	School of Computer and Information Engineering	b2012317	Motor drives and controls	non-test	2	32	24	8	Autumn 4
	Subtotal(Required Professional Course)					**28**	**448**	**334**	**114**	
	select different courses in different modules for 7 credits	Module A	b2012248	Radio frequency identification technology	non-test	2	32	24	8	Autumn 3
			b2012319	FPGA Principles and Applications (English-taught)	non-test	3	48	24	24	Spring 3
			b2012247	Telematics	non-test	2	32	32	0	Autumn 4
		Module B	b2012148	Speech signal processing	non-test	2	32	24	8	Autumn 3
			b2012320	DSP Principles and Applications (English-taught)	non-test	3	48	24	24	Spring 3
			b2012296	Artificial Intelligence Technology	non-test	2	32	32	0	Autumn 4
	Subtotal (Selective Professional Course)					**7**	**112**	**80**	**32**	
Subtotal (Professional Course)						**35**	**560**	**414**	**146**	

IX. Teaching schedule (3)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Professional Practice	required	Engineering Training	b4090002	Basic Engineering Training B	non-test	2	48		48	Summer 1
	required	School of Computer and Information Engineering	b4012011	Practice for Fundamental Electronic Engineering	non-test	2	48		48	Summer 1
	required	School of Computer and Information Engineering	b4012192	Automotive Electronics Integrated Training Ⅰ	non-test	1	24		24	Summer 1
	required	School of Computer and Information Engineering	b4012193	Comprehensive Automotive Electronics Training II	non-test	2	48		48	Summer 2
	required	School of Computer and Information Engineering	b4012010	Practice for Circuit Design Simulation	non-test	2	48		48	Summer 2
	required	School of Computer and Information Engineering	b4012195	Comprehensive training for automotive embedded systems	non-test	2	48		48	Summer 2
	required	School of Computer and Information Engineering	b4000006	the Program of Electronic Information Engineering Innovation and Entrepreneurship	non-test	2	48		48	Spring 3
	required	School of Computer and Information Engineering	b4012186	Labour Education B	non-test	0.5	16		16	Spring 3
	required	School of Computer and Information Engineering	b4012194	Automotive Electronics Integrated Training III	non-test	2	48		48	Summer 3
	required	School of Computer and Information Engineering	b4012196	Integrated Signal and Information Processing	non-test	2	48		48	Summer 3
	required	School of Computer and Information Engineering	b4012136	Electronic Information Engineering Graduation Internship and Graduation Design (Thesis)	non-test	6	288		288	Spring 4
Subtotal(Professional Practice)						**23.5**	**712**		**712**	
Extracurricular Class	required	Others	b5110001	Extracurricular Class	non-test	**1**	-	-	-	Autumn, Spring, Summer
Total						**165**	**3096**	**2024**	**1072**	

Description of Selective Professional Course:

Selective Professional Course are divided into modules according to different competency requirements, and students must take one of the modules and achieve the required credits for that module.

Module A: Intelligent Hardware. Focuses on the learning of intelligent hardware systems and other knowledge, and develops students' basic skills in the design, development and debugging of intelligent hardware systems.

Module B: Signal and Information Processing. Focuses on the study of signal processing and other knowledge to train students with basic skills in signal processing system design, development and debugging.

X. Prerequisite for Course Study

No.	Course Name	Prerequisite Course
1	Analog Electronic Technology	Fundamentals of Circuit Analysis
2	Digital Electronic Technology	Fundamentals of Circuit Analysis
3	Microcontroller Principles and Applications	Fundamentals of Circuit Analysis, Analog Electronic Technology, Digital Electronic Technology
4	Signal and System	Fundamentals of Circuit Analysis, Complex Functions and Integral Transformations
5	Digital Signal Processing	Signal and System
6	Electromagnetic fields and electromagnetic waves	Fundamentals of Circuit Analysis, Analog Electronic Technology, Digital Electronic Technology
7	RF electronic circuits	Analog Electronic Technology, Digital Electronic Technology
8	FPGA Principles and Applications (English-taught)	Analog Electronic Technology, Digital Electronic Technology
9	Automotive Embedded Operating Systems	Embedded Systems and Its Applications, Fundamentals of Programming
10	Embedded Systems and Its Applications	Microcontroller Principles and Applications
11	Foundations of Information Theory	Functions of complex variables and integral transformations, Probability Theory and Mathematical Statistics
12	DSP Principles and Applications (English-taught)	Digital Signal Processing
13	Digital image processing	Digital Signal Processing
14	Speech signal processing	Digital Signal Processing
15	Sensor and microcomputer interface technology	Analog Electronic Technology, Digital Electronic Technology, Embedded Systems and Its Applications
16	Automotive electronics	Analog Electronic Technology Digital Electronic Technology
17	Comprehensive training for automotive embedded systems	Sensor and microcomputer interface
18	Integrated Signal and Information Processing	Digital image processing

XI. Credit of Extracurricular Class

Through taking extracurricular classes, students are encouraged to take part in academic lectures, social practice activities, campus cultural and sports activities, innovative and entrepreneurial activities, voluntary activities, etc. to improve their social adaptability and enhance the competitiveness in the job market. Details are specified in Students' Manual.