

# **Department of Electrical and Electronic Engineering**

## **Information Engineering**

### **I. Introduction**

Information Engineering is a promising discipline, which is the result of signals and information processing technology, communication technology, and computer science rapidly penetrated into traditional information industries, and finally combined with the depth by it. In China, information industry is currently the most active and fast-growing profession. This industry has deeply involved in international competition now, and has also become the most vital supporting power of social productivity in many nations. These years, with the increasing demand on the eco-friendly, integrated, and smart information system, professional talents in information engineering are deeply in need.

### **II. Objectives**

The Information Engineering major aims to cultivate students with solid fundamental theory on information transmission and processing, information gathering and its application. Upon graduation, students are expected to work in information processing, information transmission, communication networks, wireless communications, computer communications, information systems and other related professions. Our students can either continue post-graduate education in information engineering or related fields after graduation, or pursue research, development, education, and management positions at a broad spectrum of enterprises, research institutes, and universities.

### **III. Period of Study and Degree Requirement**

**Time length:** 4 years

**Degree conferred:** Bachelor Degree of Engineering

**The minimum credit requirement for graduation: 152 credits**

#### **IV. Discipline**

Major disciplines includes Information and Communications Engineering. Interdisciplinary subject includes Electrical and Electronics Science and Technology, Computer Science and Technology.

#### **V. Main Courses**

Core courses includes Signals and Systems, Digital Signal Processing, Digital Image Processing, Speech Signal Processing, Communication Principles, Data Communications and Networking, Wireless Communications, Data Structures and Algorithm Analysis, Embedded System, Digital System Design, Communication System Design, Database Principles, Pattern Recognition, and DSP Design and Simulation .etc.

#### **VI. Practice - Based Courses**

Core practical training includes industrial practice, Advanced Electronic Science Experiment I (Outstanding students after their junior year, can join research working with their professor), and all sorts of domestic and international academic competitions.

#### **VII. Course Structure and Credit Requirement**

General Education (GE) Required Courses: 66.5 credits; (General Physics A)

General Education (GE) Elective Courses: 10 credits;

Major Foundational Courses: 25 credits;

Major Core Courses: 22.5 credits;

Major Elective Courses: 16 credits;

Undergraduate Thesis/Projects, Research Projects and Internship: 12 credits;  
The minimum credit requirement for graduation: 152 credits.

## VIII. Course Arrangement

**Table 1: Major Required Courses (Foundational and Core courses)**

Major Required Courses	Course Code	Course Name	Credit	Lab Credits	Hours /week	Terms	Advised term to take the course	Instruction language	Prerequisite	Dept
Foundational Courses	EE104	Fundamentals of electric circuits	2		2	Spr.	1/Spr.	C/E	MA101b MA102b MA103b	EE
	EE201	Analog circuit	4	1	5	Fall	2/Fall	C	MA103b PHY101a PHY102a EE104	
	EE202	Digital circuit	4	1	5	Spr.	2/Spr.	C	PHY102a EE203 EE201	
	EE205	Signals and Systems	3	1	4	Fall	2/Fall	C/E	NA	
	EE208	Engineering electromagnetics	3	1	4	Spr.	2/Spr.	C/E	MA101b MA102b MA103b EE104	
	EE206	Communication Principles	3	1	4	Spr.	2/Spr.	C/E	EE 205	
	MA212	Probability Theory and Statistics	3		3	Spr.	2/Spr.	C/E	MA101b MA102b MA103b	MA
	CS203	Data Structures and Algorithm Analysis	3	1	4	Fall	2/Fall	C	NA	CS
	<b>Total</b>		<b>25</b>	<b>6</b>	<b>31</b>					

Core Courses	EE301	Frontier Seminars in Modern Electronic Science and Technology I	1		1	Fall	3/Fall	C/E	NA	EE
	EE313	Wireless Communications	3	1	4	Fall	3/Fall	C/E	EE206	
	CS305	Computer networks	3	1	4	Fall	3/F	C/E	EE206	CS
	EE323	Digital signal processing	3	1	4	Fall	3/Fall	E	EE205	
	EE326	Digital Image Processing	3	1	4	Spr.	3/Spr.	E	EE323	
	EE302	Frontier Seminars in Modern Electronic Science and Technology II	1		1	Spr.	3/Spr.	C/E	NA	
	EE401	Frontier Seminars in Modern Electronic Science and Technology III	1		1	Fall	4/Fall	C/E	NA	
	EE328	Speech Signal Processing	3	1	4	Spr.	3/Spr.	E	EE323	
	EE330	DSP Design and Simulation	1.5	1.5	3	Spr.	3/Spr.	C/E	EE323	
	EE332	Digital system design	3	1	4	Spr.	3/Spr.	E	EE323	
	<b>Total</b>		<b>22.5</b>	<b>7.5</b>	<b>30</b>					
EE470		Internship	2	2	16	Smr.	3/Smr.	NA	NA	EE

EE480	Research Projects	2	2				NA	NA	
EE490	Undergraduate Thesis/Projects	8	8	8	Fall Spr.	4/Fall & Spr.	NA	NA	
<b>Total</b>		<b>12</b>	<b>12</b>	<b>24</b>					
<p>*Note: Internship will last approximately 4 to 6 weeks, 14 to 16 hours per week.</p> <p>**Note: Students can choose whatever term they like to select Research Projects course, so it is not listed on advised term to take the course. Minimum learning hours of this course are 48 to 64 hours in total.</p>									

**Table 2: Major Elective Courses**

Course Code	Course Name	Credits	Lab Credits	Hours /week	Terms	Advised term to take the course	Instruction language	Prerequisite	Dept.
EE423	Pattern Recognition	2		2	Fall	4/Fall	C/E	EE323 EE326	
EE427	Principles of Remote Sensing	2		2	Fall	4/Fall	C/E	EE323 EE326	
EE314	Communication System Design I	2	2	4	Spr.	3/Spr.	C/E	EE313	
EE419	Biosensor	3	1	4	Fall	4/Fall	E	NA	
EE411	Information Theory and Coding	2		2	Fall	4/Fall	C/E	MA101b MA102b MA103b MA212	
CS301	Embedded System and Microcomputer Principle	3	1	4	Fall	3/Fall	C/E	NA	CS
CS307	Database Principle	3	1	4	Fall	3/Fall	C/E	NA	CS
CS403	Cryptography and Network Security	2		2	Fall	4/Fall	C/E	CS201 CS305 CS302	CS
MA208	Fundamental of Random Processes	3		3	Spr.	2/Spr.	E	MA101b MA102b MA103b MA212	MA
EE106	Introduction to Optoelectronic	2		2	Spr.	1/Spr.	C	NA	
EE203	Solid-State Electronics	3		3	Fall	2/Fall	C/E	MA101b MA102b PHY101a PHY102a	
EE204	Introduction to Semiconductor Devices	3	1	4	Spr.	2/Spr.	C/E	EE203	
EE210	Fundamentals of Optics	3		3	Spr.	2/Spr.	C/E	NA	
EE303	Fundamental of Optoelectronic Technology	3	1	4	Fall	3/Fall	C/E	NA	
EE304	Integrated Circuit Design	3	2	5	Spr.	3/Spr.	C/E	MA101b	

								MA102b EE202 EE204	
EE305	Introduction to VLSI Technology	3	1	4	Fall	3/Fall	C/E	EE202	
EE306	Introduction to MEMS	3	1	4	Spr.	3/Spr.	E	PHY101a PHY102a	
EE307	Antennas and Radio Propagation	3	1	4	Fall	3/Fall	C/E	EE104 EE201 EE208	
EE308	Fiber Communication Principles and Techniques	3	1	4	Spr.	3/Spr.	C/E	EE303	
EE309	Introduction to Semiconductor Optics	3		3	Fall	3/Fall	C/E	EE203	
EE310	Principles and Technologies of Lasers	3		3	Spr.	3/Spr.	C/E	NA	
EE311	Optical Design	3	1	4	Fall	3/Fall	C/E	PHY307	
EE316	Microwave Engineering	3	1	4	Spr.	3/Spr.	E	EE104 EE201 EE208	
EE317	Advanced Electronic Science Experiment I*	1	1	2	Fall	3/Fall	NA	NA	
EE318	Advanced Electronic Science Experiment II	1	1	2	Spr.	3/Spr.	NA	NA	
EE320	Integrated Circuit Fabrication Laboratory	3	1.5	4.5	Spr./Fall	3/Spr./Fall	C	EE203	
EE321	Spectral Technology and Application	3		3	Fall	3/Fall	C/E	NA	
EE322	Optoelectronics Devices Fabrication Laboratory	2	1	3	Spr.	3/Spr.	C/E	EE203 EE204 EE303 EE309 EE310	
EE324	Laser Microfabrication	3		3	Spr.	3/Spr.	C/E	NA	
EE325	Nonlinear Optimization Techniques for Electrical Engineering	3	1	4	Fall	3/Fall	C/E	MA101b MA102b MA103b	
EE402	Frontier Seminars in Modern Electronic Science and Technology IV	1		1	Spr.	4/Spr.	C/E	NA	
EE403	Introduction to Display and Lighting Technologies	2		2	Fall	4/Fall	C/E	EE311 EE203 EE204	
EE405	Advanced Electronic Science	1	1	2	Fall	4/Fall	NA	NA	



	Experiment III								
EE407	Energy Harvesting Technologies	3		3	Fall	4/Fall	C/E	NA	
EE409	Ultrafast Photonics	3	1	4	Fall	4/Fall	C/E	NA	
EE417	Communications System Design II	2	2	4	Fall	4/Fall	E	EE316 EE307 EE206	
MA104b	Linear Algebra II	4		4	Spr.	1/Spr.	C/E	MA103b	MA
MA201b	Ordinary Differential Equations B	4		4	Fall	2/Fall	C/E	MA101b MA102b MA103b	MA
EE327	Fundamentals of Information Optics	3	1	4	Fall	3/F	C/E	EE205	
EE329	Liquid crystal optoelectronics	2	1	3	Fall	3/F	C	EE210	
EE331	Fundamentals of the 3rd generation Semiconductors	2		2	Fall	3/F	C/E	EE203orE E204	
EES101	Brief Introduction of Creative Electronic Design I	1	0.5	6	Sum	3/ Sum	C	PHY101a PHY102a	
EES102	DIY Project: Assembling an iphone6	2	2	8	Sum	3/ Sum	C	NA	
EES201	Brief Introduction of Creative Electronic Design II	0.5	0.5	4	Sum	6/ Sum	C	NA	
EES202	Design Based on LabVIEW Programming	1	1	8	Sum	6/ Sum	C	NA	
EES203	Innovation and Entrepreneurship	0.5	0.5	4	Sum	6/ Sum	C	NA	
EES204	Fiber Sense Design	1	1	8	Sum	6/ Sum	C	NA	
EES205	Advanced Technology Forecasting	1.5		6	Sum	6/ Sum	E	NA	
EES301	Statistical Machine Learning	2		8	Sum	9/ Sum	E	MA103b	
EES302	2D Materials: Properties and Devices	2		8	Sum	9/ Sum	E	NA	
<b>Total</b>		<b>117.5</b>	<b>32</b>	<b>192.5</b>					
<p>*Note: To meet the graduate criteria, one must select at least 16 credits course from above.</p> <p>**Note: Advanced Electronic Science Experiment can be selected by outstanding senior students. This course will allow those students accomplish researching work with their professors.</p>									

**Table 3: Overview of Practice-Based Courses**

Course Code	Course Name	Credits	Lab Credits	Hours /week	Terms	Advised term to take the	Instruction language	Prerequisite	Dept.
EE201	Analog Circuit	4	1	5	Fall	2/Fall	C	MA103b PHY101a PHY102a EE104	
EE202	Digital Circuit	4	1	5	Spr.	2/Spr.	C	PHY102a EE203 EE201	
EE205	Signals and Systems	3	1	4	Fall	2/Fall	C/E	NA	
EE208	Engineering Electromagnetics	3	1	4	Spr.	2/Spr.	C/E	MA101b MA102b MA103b EE104	
EE206	Communication Principles	3	1	4	Spr.	2/Spr.	C/E	EE 205	
CS203	Data Structures and Algorithm Analysis	3	1	4	Fall	2/Fall	C	NA	CS
EE313	Wireless Communications	3	1	4	Fall	3/Fall	C/E	EE206	
EE315	Data Communications and Networking	3	1	4	Fall	3/Fall	C/E	EE206	
EE323	Digital Signal Processing	3	1	4	Fall	3/Fall	E	EE205	
EE326	Digital Image Processing	3	1	4	Spr.	3/Spr.	E	EE323	
EE328	Speech Signal Processing	3	1	4	Spr.	3/Spr.	E	EE323	
EE330	DSP Design and Simulation	1.5	1.5	3	Spr.	3/Spr.	C/E	EE323	
EE332	Digital System Design	3	1	4	Spr.	3/Spr.	E	EE323	
EE314	Communication System Design I	2	2	4	Spr.	3/Spr.	C/E	EE313	
EE419	Biosensor	3	1	4	Fall	4/Fall	E	NA	
CS307	Database Principle	3	1	4	Fall	3/Fall	C/E	NA	CS
CS301	Embedded System and Microcomputer Principle	3	1	4	Fall	3/Fall	C/E	NA	
EE470	Industrial Practice	2	2	16	Smr.	3/Smr.	NA	NA	

EE480	Projects of Science and Technology Innovation	2	2				NA	NA	
EE490	Thesis (Graduation Project)	8	8	8	Fall & Spr.	4/Fall&Spr.	NA	NA	
EE204	Introduction to Semiconductor Devices	3	1	4	Spr.	2/Spr.	C/E	EE203	
EE303	Fundamental of Optoelectronic Technology	3	1	4	Fall	3/Fall	C/E	NA	
EE304	Integrated Circuit Design	3	2	5	Spr.	3/Spr.	C/E	MA101b MA102b EE202 EE204	
EE305	Introduction to VLSI Technology	3	1	4	Fall	3/Fall	C/E	EE202	
EE306	Introduction to MEMS	3	1	4	Spr.	3/Spr.	E	PHY101a PHY102a	
EE307	Antennas and Radio Propagation	3	1	4	Fall	3/Fall	C/E	EE104 EE201 EE208	
EE308	Fiber Communication Principles and Techniques	3	1	4	Spr.	3/Spr.	C/E	EE303	
EE311	Optical Design	3	1	4	Fall	3/Fall	C/E	PHY307	
EE316	Microwave Engineering	3	1	4	Spr.	3/Spr.	E	EE104 EE201 EE208	
EE317	Advanced Electronic Science Experiment I*	1	1	2	Fall	3/Fall	NA	NA	
EE318	Advanced Electronic Science Experiment II	1	1	2	Spr.	3/Spr.	NA	NA	
EE320	Integrated Circuit Fabrication Laboratory	3	1.5	4.5	Spr./Fall	3/Spr./Fall	C	EE203	
EE322	Optoelectronics Devices Fabrication Laboratory	2	1	3	Spr.	3/Spr.	C/E	EE203 EE204 EE303 EE309 EE310	
EE325	Nonlinear Optimization Techniques for Electrical Engineering	3	1	4	Fall	3/Fall	C/E	MA101b MA102b MA103b	
EE405	Advanced Electronic Science	1	1	2	Fall	4/Fall	NA	NA	

	Experiment III								
EE409	Ultrafast Photonics	3	1	4	Fall	4/Fall	C/E	NA	
EE417	Communications System Design II	2	2	4	Fall	4/Fall	E	EE316 EE307 EE206	
EE327	Fundamentals of Information Optics	3	1	4	Fall	3/F	C/E	EE205	
EE329	Liquid crystal optoelectronics	2	1	3	Fall	3/F	C	EE210	
EES101	Brief Introduction of Creative Electronic Design I	1	0.5	6	Sum	3/Sum	C	PHY101a PHY102a	
EES102	DIY Project: Assembling an iphone6	2	2	8	Sum	3/ Sum	C	NA	
EES201	Brief Introduction of Creative Electronic Design II	0.5	0.5	4	Sum	6/ Sum	C	NA	
EES202	Design Based on LabVIEW Programming	1	1	8	Sum	6/ Sum	C	NA	
EES203	Innovation and Entrepreneurship	0.5	0.5	4	Sum	6/ Sum	C	NA	
EES204	Fiber Sense Design	1	1	8	Sum	6/ Sum	C	NA	
<b>Total</b>		<b>116.5</b>	<b>57.5</b>	<b>200.5</b>					

**Table 4: Overview of Course Hours and Credits**

<b>Course Category</b>	<b>Total Course Hours</b>	<b>Total Credits</b>	<b>The Minimum Credit Requirement</b>
General Education (GE) Required Courses	1168	66.5	66.5
General Education (GE) Elective Courses	3144	182.5	10
Major Foundational Courses	496	25	25
Major Core Courses	480	22.5	22.5
Major Elective Courses	2904	117.5	16
Internship, Research Projects, and Undergraduate Thesis/Projects	Est 380	12	12
<b>Total</b>	8572	426	152