Department of Electrical and Electronic Engineering

Program of Communication Engineering for Class 2018

I. Introduction

Communication engineering, especially wireless communications engineering, has become extremely important throughout the world and in particular for Shenzhen, which is recognized as a world-class center of communication industry. With the increasing demand on mobile data access, the development of next generation broadband communication systems has been initiated, which would boost up career opportunity in related academic and industrial fields. The offered 4-year undergraduate program on communication engineering is tailored for the most cutting-edge areas in communication engineering. In addition to lecturers and labs, students are also encouraged to work with supervisors on real research problems as early as the second year of the program. The key areas under study include: classic and modern communication theory, microwave engineering, wireless communications, optical communications, computer networks, embedded systems, microwave imaging, etc.

II. Objectives

The Communication Engineering major aims to cultivate students with solid fundamental theory of communication engineering, modern communication technologies and related R&D capabilities, abilities to use English and computer, and being engaged in science research, engineering design, equipment manufacturing, network operations and technology management in the field of information and communication, as well as in various fields of national economy related to Information Communication Technology (ICT). Upon graduation, the students are expected to work in wireless communication, antenna and microwave engineering, information engineering, integrated circuit and communication system design, research and development, and continue post-graduate education in communication engineering, microwave engineering, information engineering, or pursue research, development, education, and management positions at a broad spectrum of enterprises, research institutes, and universities.

III. Study Length and Degree Requirements

Study length: 4 years

Degree conferred: Bachelor of Engineering

The minimum credit requirement for graduation: 137 credits (not including English courses).

IV. Discipline

Major Disciplines include Communication Engineering, Electronic Engineering, and Information Engineering .etc.

V. Main Courses

Core courses include Signals and Systems, Series of courses concerning Circuit Theory and its Application, Engineering Electromagnetics, Digital Signal Processing, Communication Principles, Wireless Communications, Antennas and Radio Propagation, Fiber Communication, Data Communication and Networking, Series of courses concerning Communication System Design, Microwave Engineering .etc.

VI. Practice-Based Courses

Core practical training includes Industrial practice, Advanced Electronic Science Experiment (It is a subject elective course. Outstanding students after their junior year, can join research working with their professor), and all sorts of domestic and international academic and innovative competitions.

VII. Course Structure and Credit Requirements

General Education (GE) Required Courses: 51 credits (not including English courses);

General Education (GE) Elective Courses: 10 credits (4 credits for Humanities Module, 4 credits for Social Sciences Module, and 2 credits for Arts Module);

Major Foundational Courses： 31 credits;

Major Core Courses: 15 credits;

Major Elective Courses: 18 credits;

Undergraduate Thesis/Projects, Research Projects and Internship: 12 credits；

The minimum credit requirement for graduation: 137 credits (not including English courses).

VIII. Requirements for Science Module of GE Required Courses

Course Cod	Course Name	Credit	Lab Credits	Hours/week	Term	Instruction Language	Prerequisite	Dept
MA101B	Calculus I A	4		4	Spr/ Fall	B/E	NA	MA
MA102B	Calculus II A	4		4	Spr/ Fall	B/E	Calculus I A	MA
MA103A	Linear Algebra I-A	4		4	Spr/ Fall	B/E	NA	MA
PHY103B	General Physics B (I)	4		4	Spr/ Fall	B/E	NA	PHY
PHY105B	General Physics B (II)	4		4	Spr/ Fall	B/E	General Physics B (I)	PHY
CH101B	General Chemistry B	3		3	Spr/ Fall	B/E	NA	CH
BIO102B	Introduction to Life Science	3		3	Spr/ Fall	B/E	NA	BIO
CS102A	Introduction to Computer Programming A	3	1	4	Spr/ Fall	B/E	NA	CS
PHY104B	Experiments of Fundamental Physics	2	2	4	Spr/ Fall	B/E	NA	PHY
Total		**31**	**3**	**34**				

IX. Pre-requisites for Major Declaration

Course Code	Course Name	Notes
EE104	Fundamentals of Electric Circuits	
EE201-17	Analog Circuits	
EE201-17L	Analog Circuits Laboratory	
EE202-17	Digital Circuits	
EE202-17L	Digital Circuits Laboratory	
EE205	Signals and Systems	
EE206	Communication Principles	
EE208	Engineering Electromagnetics	

X. Course Arrangement

Table 1: Major Required Course (Foundational and Core Courses)

Course Category	Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	take the course Advised term to	language Instruction	Prerequisite	Dept.
Major Foundational Courses	EE104	Fundamentals of Electric Circuits	2		2	Spr/ Fall	1/ Spr or Fall	B/E	MA102B MA103A or MA103B	EE
	EE201-17	Analog Circuits	3		3	Fall	2/Fall	C	PHY105B EE104	EE
	EE201-17L	Analog Circuits Laboratory	1	1	2	Fall	2/Fall	B	EE201-17	EE
	EE202-17	Digital Circuits	3		3	Spr/ Fall	2/Spr or Fall	B/E	PHY105B	EE
	EE202-17L	Digital Circuits Laboratory	1	1	2	Spr/ Fall	2/Spr or Fall	B/E	EE202-17	EE
	EE203	Solid-state Electronics	3		3	Fall	2/Spr or Fall	B/E	NA	EE
	EE205	Signals and Systems	3	1	4	Fall	2/Fall	B	NA	EE
	EE206	Communication Principles	3	1	4	Spr	2/Spr	E	EE205	EE
	EE208	Engineering Electromagnetics	3	1	4	Spr	2/Spr	B	MA101B MA103A EE104	EE
	MA212	Probability and Statistics	3		3	Spr	2/Spr	B/E	MA102B Or MA102a	MA
	CS203B	Data Structures and Algorithm Analysis B	3	1	4	Fall	2/Fall	E	CS102A	CS
	EE316	Microwave Engineering	3	1	4	Fall	3/Fall	E	EE104 EE201-17 EE208	EE
	Total		31	7	38					
Major Core Courses	EE301	Frontier Seminars in Modern Electronic Science and Technology I	1		1	Fall	3/Fall	B	NA	EE
	EE302	Frontier Seminars in Modern Electronic Science and Technology II	1		1	Spr	3/Spr	B	NA	EE
	EE307	Antennas and Radio Propagation	3	1	4	Spr	3/Spr	E	EE208 EE104	EE
	EE313	Wireless Communications	3	1	4	Fall	3/Fall	E	EE206	EE
	CS305	Computer Networks	3	1	4	Fall	3/Fall	E	CS102A	CS

	EE312	Design of Modern Communication Systems	3	1	4	Spr	3/Spr	B	EE206 EE313	EE
	EE401	Frontier seminars in modern electronic science and technology III	1		1	Fall	4/Fall	B	NA	EE
	Total		15	4	19					
Practice	EE470	Internship*	2	2	16	Smr	3/Smr	NA	NA	EE
	EE480	Research Projects**	2	2				NA	NA	EE
	EE490	Undergraduate Thesis/Projects	8	8	8	Fall & Spr	4/Fall& Spr	NA	NA	EE
Total			12	12	24					

Notes:

1. Internship will be approximately 4 to 6 weeks, 14 to16 hours per week.
2. Students can choose the term most appropriate for the course of Research Projects based on their study plan, so the advised term to take the course is not listed here. The minimum study load for this course is 48 to 64 hours in total.

Table 2: Major Elective Courses

Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	Advised term to take the course	language Instruction	Prerequisite	Dept.
EE106	Introduction to Optoelectronic	2		2	Spr	1/Spr	C	NA	EE
EE204	Introduction to Semiconductor Devices	3	1	4	Spr	2/Spr	B	EE203	EE
EE210	Fundamentals of Optics	3		3	Spr	2/Spr	B	NA	EE
EE303	Fundamentals of Optoelectronic Technology	3	1	4	Fall	3/Fall	B	PHY105B	EE
EE304	Integrated Circuit Design	3	2	5	Fall	3/Fall	E	EE202-17 EE204	EE
EE305	Introduction to VLSI technology	3	1	4	Fall	3/Fall	B	EE203	EE
EE306	Introduction to MEMS	3	1	4	Spr	3/Spr	E	PHY105B	EE
EE308	Fiber Communication Principles and Techniques	3	1	4	Spr	3/Spr	B	NA	EE
EE309	Introduction to Semiconductor Optics	3		3	Fall	3/Fall	B	NA	EE
EE310	Principles and Technologies of Lasers	3		3	Spr	3/Spr	B	NA	EE
EE311	Optical Design	3	1	4	Fall	3/Fall	B	NA	EE
EE317	Advanced Electronic Science Experiment I	1	1	2	Fall	3/Fall		NA	EE
EE318	Advanced electronic science experiment II	1	1	2	Spr	3/Spr		NA	EE
EE320-15	Integrated Circuit Fabrication Laboratory	3	1.5	4.5	Spr Fall	3/Spr Fall	C	EE204	EE
EE322	Optoelectronics Devices Fabrication Laboratory	2	1	3	Spr	3/Spr	B	EE204	EE
EE323	Digital Signal Processing	3	1	4	Fall	3/Fall	E	EE205	EE
EE325	Nonlinear Optimization Techniques for Electrical Engineering	3	1	4	Fall	3/Fall	E	MA102B MA103A	EE
EE326	Digital Image Processing	3	1	4	Spr	3/Spr	E	EE205	EE
EE327	Fundamentals of Information Optics	3	1	4	Fall	3/Fall	B	EE205	EE
EE328	Speech Signal Processing	3	1	4	Spr	3/Spr	B	EE323	EE
EE330	DSP Design and Simulation	1.5	1.5	3	Spr	3/Spr	C	EE323	EE
EE332	Digital System Design	3	1	4	Spr	3/Spr	E	EE202-17	EE
EE334	Advanced Integrated Circuit Design: Machine Learning on Chip	3	1	4	Spr	3/Spr	E	EE202-17	EE
EE335	Liquid Crystal Optoelectronics	3	1	4	Fall	3/Fall	C	EE210	EE

EE336	Fundamentals of Photovoltaics	3	1	4	Fall	3/Fall	E	EE204	EE
EE337	Analog Integrated Circuit Design	3	1	4	Fall	3/Fall	B	EE201-17 EE204	EE
EE339	Analog IC Layout Design	1	1	2	Fall	3/Fall	B	EE304	EE
EE341	Advanced Integrated Circuit Design: Microprocessor	3	1	4	Fall	3/Fall	B	EE202-17	EE
EE343	Optoelectronic Instrumentation	3	1	4	Fall	3/Fall	B	NA	EE
EE345	Introduction of Wide Bandgap Semiconductors	3		3	Fall	3/Fall	B	EE203 or EE204	EE
EE402	Frontier Seminars in Modern Electronic Science and Technology IV	1		1	Spr	4/Spr	B	NA	EE
EE403	Introduction to Display and Lighting Technologies	2		2	Fall	4/Fall	B	EE204	EE
EE405	Advanced Electronic Science Experiment III	1	1	2	Fall	4/Fall	NA	NA	EE
EE411	Information theory and coding	2		2	Fall	4/Fall	B	MA212	EE
EE417	Communications System Design II	2	2	4	Fall	4/Fall	E	EE316 EE206 EE307	EE
EE423-14	Pattern Recognition	3	1	4	Fall	4/Fall	B	EE323 EE326	EE
EE427	Principles of Remote Sensing	2		2	Fall	4/Fall	B	EE323 EE326	EE
EE429	Image and Video Processing	3	1	4	Fall	4/Fall	E	EE205 MA103A MA212	EE
EE431	BioMEMS and Lab-on-a-Chip	3		3	Fall	4/Fall	E	NA	EE
EE433	Modern Electric Vehicle Technologies	2		2	Fall	4/Fall	B	EE104 EE208	EE
EES101	Brief Introduction of “Creative Electronic Design I"	1	0.5	6	Smr	1/Smr	C	PHY102B	EE
EES102	DIY Project: Assembling an iPhone6	2	2	8	Smr	1/Smr	C	NA	EE
EES201	Brief Introduction of “Creative Electronic Design II"	0.5	0.5	4	Smr	2/Smr	C	NA	EE
EES202	Design based on LabVIEW Programming	1	1	8	Smr	2/Smr	C	NA	EE
EES203	Innovation and Entrepreneurship	0.5	0.5	4	Smr	2/Smr	C	NA	EE
EES204	Fiber Sensor Design	1	1	8	Smr	2/Smr	C	NA	EE
EES205	Advanced Technology Forecasting	1.5		6	Smr	2/Smr	E	NA	EE
EES301	Statistical Machine Learning	2		8	Smr	3/Smr	E	MA103A MA212	EE
EES302	2D Materials: Properties and Devices	2		8	Smr	3/Smr	E	NA	EE

EES303	Convex Optimization	2		2	Smr	3/Smr	E	MA103A MA215 or MA212	EE
EES305	Electronic Materials	2		2	Smr	3/Smr	E	NA	EE
CS201	Discrete Mathematics	3		3	Fall	2/Fall	B	MA102B MA103A	CS
CS302	Operating Systems	3	1	4	Spr	3/Spr	B	CS301	CS
CS303B	Artificial Intelligence B	3	1	4	Fall	3/Fall	E	CS203B CS102A MA212	CS
CS309	Object-oriented Analysis and Design	3	1	4	Fall	3/Fall	B	CS202 CS203 CS102A	CS
CS403	Cryptography and Network Security	2		2	Fall	4/Fall	B	CS201 CS305 CS302	CS
CS202	Computer Organization Principle	3	1	4	Spr	2/Spr	B	CS207	CS
CS301	Embedded System and Microcomputer Principle	3	1	4	Fall	3/Fall	B	CS207	CS
BMEB221	Biomedical Instrumentation	4	2	6	Spr	2/Spr	C	NA	BMEB
MA206	Mathematical Modeling	3		3	Spr	2/Spr	B	MA203A or MA213	MA
MA305	Numerical Analysis	3		3	Fall	3/Fall	B	MA203A or MA213	MA
MA110	MATLAB Programming and Application	3	1	4	Spr	1/Spr	B	NA	MA
MA201b	Ordinary Differential Equations B	4		4	Fall	2/Fall	B	MA102B	MA
MA202	Complex Analysis	3		3	Spr	2/Spr	B	MA203A or MA213	MA
MA208-13	Applied Stochastic Processes	4		4	Spr	2/Spr	E	MA212 or MA204	MA
Total		161	45.5	249.5					

Table 3: Overview of Practice-Based Courses

Course Code	Course Name	Credits	Lab Credits	Hours/week	Terms	Advised term to take the course	language Instruction	Prerequisite	Dept.
EE201-17L	Analog Circuits Laboratory	1	1	2	Fall	2/Fall	B	EE201-17	EE
EE202-17L	Digital Circuits Laboratory	1	1	2	Spr /Fall	2/Spr or Fall	B/E	EE202-17	EE
EE204	Introduction to Semiconductor Devices	3	1	4	Spr	2/Spr	B	EE203	EE
EE205	Signals and Systems	3	1	4	Fall	2/Fall	B	NA	EE
EE206	Communication Principles	3	1	4	Spr	2/Spr	E	EE205	EE
EE208	Engineering Electromagnetics	3	1	4	Spr	2/Spr	B	MA101B MA103A EE104	EE
EE303	Fundamentals of Optoelectronic Technology	3	1	4	Fall	3/Fall	B	PHY105B	EE
EE304	Integrated Circuit Design	3	2	5	Fall	3/Fall	E	EE202-17 EE204	EE
EE305	Introduction to VLSI technology	3	1	4	Fall	3/Fall	B	EE203	EE
EE306	Introduction to MEMS	3	1	4	Spr	3/Spr	E	PHY105B	EE
EE307	Antennas and Radio Propagation	3	1	4	Spr	3/Spr	E	EE208 EE104	EE
EE308	Fiber Communication Principles and Techniques	3	1	4	Spr	3/Spr	B	NA	EE
EE311	Optical Design	3	1	4	Fall	3/Fall	B	NA	EE
EE313	Wireless Communications	3	1	4	Fall	3/Fall	E	EE206	EE
EE312	Design of Modern Communication Systems	3	1	4	Spr	3/Spr	B	EE206 EE313	EE
EE316	Microwave Engineering	3	1	4	Fall	3/Fall	E	EE104 EE201-17 EE208	EE
EE317	Advanced Electronic Science Experiment I	1	1	2	Fall	3/Fall		NA	EE
EE318	Advanced electronic science experiment II	1	1	2	Spr	3/Spr		NA	EE
EE320-15	Integrated Circuit Fabrication Laboratory	3	1.5	4.5	Spr Fall	3/Spr Fall	C	EE204	EE
EE322	Optoelectronics Devices Fabrication Laboratory	2	1	3	Spr	3/Spr	B	EE204	EE
EE323	Digital Signal Processing	3	1	4	Fall	3/Fall	E	EE205	EE
EE325	Nonlinear Optimization Techniques for Electrical Engineering	3	1	4	Fall	3/Fall	E	MA102B MA103A	EE
EE326	Digital Image Processing	3	1	4	Spr	3/Spr	E	EE205	EE

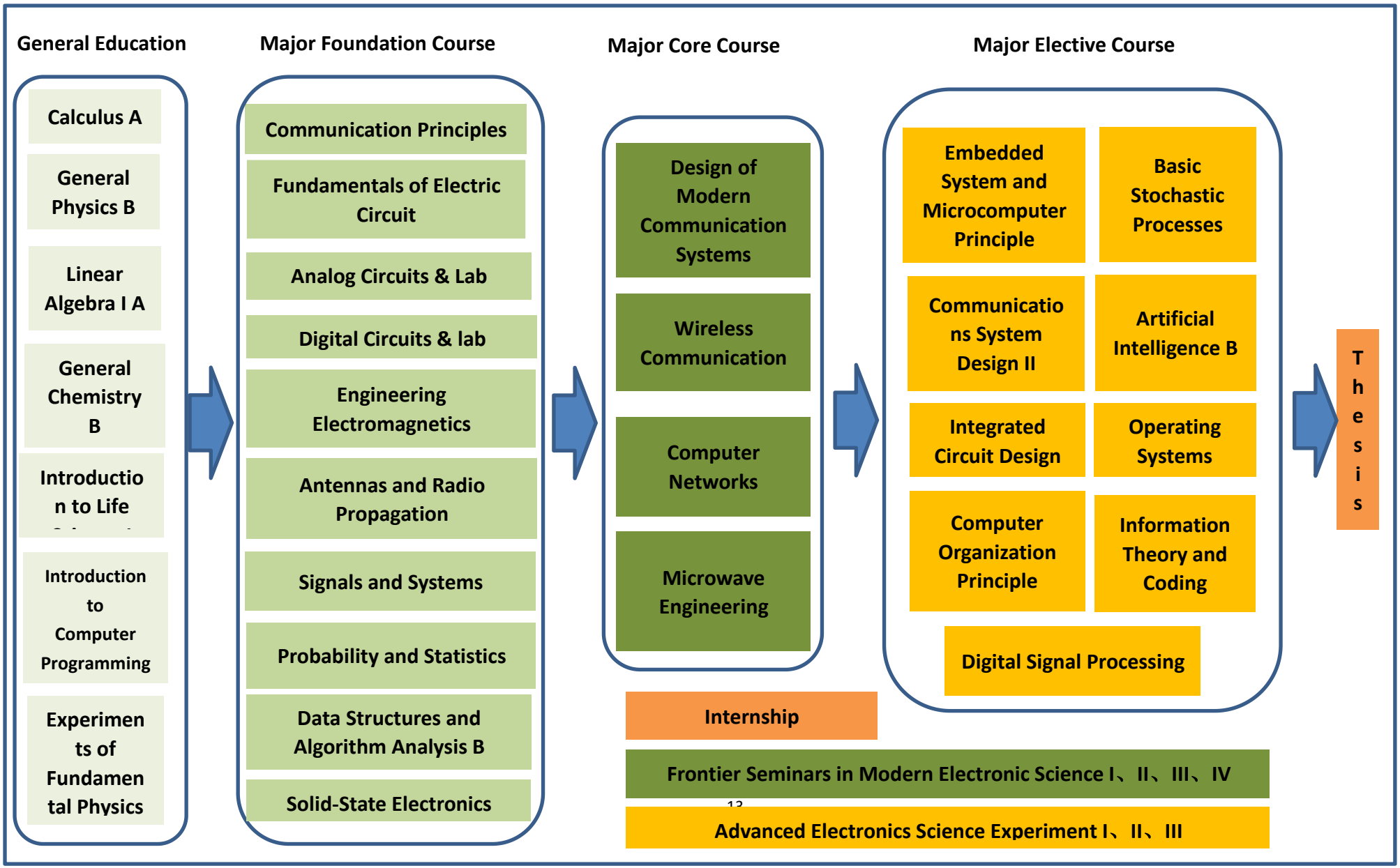
EE327	Fundamentals of Information Optics	3	1	4	Fall	3/Fall	B	EE205	EE
EE328	Speech Signal Processing	3	1	4	Spr	3/Spr	B	EE323	EE
EE330	DSP Design and Simulation	1.5	1.5	3	Spr	3/Spr	C	EE323	EE
EE332	Digital System Design	3	1	4	Spr	3/Spr	E	EE202-17	EE
EE334	Advanced Integrated Circuit Design: Machine Learning on Chip	3	1	4	Fall	3/Fall	E	EE202-17	EE
EE335	Liquid Crystal Optoelectronics	3	1	4	Fall	3/Fall	C	EE210	EE
EE336	Fundamentals of Photovoltaics	3	1	4	Fall	3/Fall	E	EE204	EE
EE337	Analog Integrated Circuit Design	3	1	4	Fall	3/Fall	B	EE201-17 EE204	EE
EE339	Analog IC Layout Design	1	1	2	Fall	3/Fall	B	EE304	EE
EE341	Advanced Integrated Circuit Design: Microprocessor	3	1	4	Fall	3/Fall	B	EE202-17	EE
EE343	Optoelectronic Instrumentation	3	1	4	Fall	3/Fall	B	NA	EE
EE405	Advanced Electronic Science Experiment III	1	1	2	Fall	4/Fall	NA	NA	EE
EE417	Communications System Design II	2	2	4	Fall	4/Fall	E	EE316 EE206 EE307	EE
EE423-14	Pattern Recognition	3	1	4	Fall	4/Fall	B	EE323 EE326	EE
EE429	Image and Video Processing	3	1	4	Fall	4/Fall	E	EE205 MA103A MA212	EE
EE470	Internship	2	2	16	Smr	3/Smr	NA	NA	EE
EE480	Research Projects	2	2				NA	NA	EE
EE490	Undergraduate Thesis/Projects	8	8	8	Fall & Spr	4/Fall& Spr	NA	NA	EE
EES101	Brief Introduction of “Creative Electronic Design I"	1	0.5	6	Smr	1/Smr	C	PHY102B	EE
EES102	DIY Project: Assembling an iPhone6	2	2	8	Smr	1/Smr	C	NA	EE
EES201	Brief Introduction of “Creative Electronic Design II"	0.5	0.5	4	Smr	2/Smr	C	NA	EE
EES202	Design based on LabVIEW Programming	1	1	8	Smr	2/Smr	C	NA	EE
EES203	Innovation and Entrepreneurship	0.5	0.5	4	Smr	2/Smr	C	NA	EE
EES204	Fiber Sensor Design	1	1	8	Smr	2/Smr	C	NA	EE

BMEB221	Biomedical Instrumentation	4	2	6	Spr	2/Spr	C	NA	BMEB
CS202	Computer Organization Principle	3	1	4	Spr	2/Spr	B	CS207	CS
CS203B	Data Structures and Algorithm Analysis B	3	1	4	Fall	2/Fall	E	CS102A	CS
CS301	Embedded System and Microcomputer Principle	3	1	4	Fall	3/Fall	B	CS207	CS
CS302	Operating Systems	3	1	4	Spr	3/Spr	B	CS301	CS
CS303B	Artificial Intelligence B	3	1	4	Fall	3/Fall	E	CS203B CS102A MA212	CS
CS305	Computer Networks	3	1	4	Fall	3/Fall	E	CS102A	CS
CS309	Object-oriented Analysis and Design	3	1	4	Fall	3/Fall	B	CS202 CS203 CS102A	CS
MA110	MATLAB Programming and Application	3	1	4	Spr	1/Spr	B	NA	MA
Total		144.5	68.5	239.5					

Table 4: Overview of Course Hours and Credits

Course Category	Total Course Hours	Total Credits	Credit Requirements
General Education (GE) Required Courses (not including English courses)	832	51	51
General Education (GE) Elective Courses		10	10
Major Foundational Courses	608	31	31
Major Core Courses	304	15	15
Major Elective Courses	3992	161	18
Research Projects, Internship and Undergraduate Thesis/Projects	380	12	12
Total (not including English courses)	6116	280	137

Curriculum Structure of Communication Engineering



Note: The Subject Elective course lists include only part of the courses, see more in Program.