

THE MINISTRY OF EDUCATION AND TRAINING
HCMC UNIVERSITY OF TECHNOLOGY AND EDUCATION
FACULTY OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNDERGRADUATE PROGRAMME

BACHELOR OF
**ELECTRONICS AND COMMUNICATION
ENGINEERING TECHNOLOGY**
(52510302)

JANUARY - 2016

**THE MINISTRY OF EDUCATION AND TRAINING
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY AND EDUCATION
Faculty of electrical and electronics engineering**

**UNDERGRADUATE PROGRAMME
(Full-time Curriculum)**

- 1- **Programme Title:** Electronics and Communication Engineering Technology
- 2- **Awarding body or institution:** HCMC University of Technology and Education
- 3- **Major:** Electronics and Communication Engineering Technology
- 4- **Expected training time:** 4 years (The maximum period of registration is 2 years)
- 5- **Type of study:** Campus based
- 6- **Admission Requirements:**
 - High school graduate candidates have total score of Mathematics, Physics, and Chemistry (group A) or Mathematics, Physics, and English (group A1), or Mathematics, Literature, English (group D1) in an annual National High School Graduation Examination held in July by MOET higher than the cut-off score set by the HCMUTE based on the student admission quota from MOET.
 - Candidates, who graduated from specialized high schools, have an average score of five consecutive terms of high school larger than 7.5 and are in top 10% of the HCMUTE annual admission quota.
- 7- **The Goals, Objectives, and Expected Learning Outcomes**

Goals:

The programme is designed to prepare graduates to assume engineering and technology positions in the electronics and communications industry. Graduates of Electronics and Communications Engineering Technology (ECET) programme have an ability to demonstrate expertise and career advancement in Electronics and Communications field through the application of fundamental knowledge, skills, and engineering technology tools. They also have potential to contribute significantly to the achievement of their organization's goals as an effective member and an ability to take part in life-long learning by being engaged with civic institutions, educational organizations, and professional societies.

Objectives:

PEO-01	Excel in their engineering careers and/or postgraduate education by utilizing the fundamental mathematical, scientific, and engineering technology principles in formulating and solving electronics and communication engineering problems
PEO-02	Communicate and work effectively in multidisciplinary teams and continue career-long professional development through engagement in lifelong learning
PEO-03	Fulfill the needs of society in solving technical problems using engineering principles, tools and practices, in an ethical and professional manner

PEO-04	Make technical contributions to design, development, and manufacturing in their practice of electronics and communication engineering technology
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Expected Learning Outcomes:

ELO-01	An ability to apply knowledge of mathematics, science, computer fundamentals, and engineering
ELO-02	An ability to identify, formulate and solve engineering problems and to design a system, component, or process to meet desired needs
ELO-03	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
ELO-04	An ability to apply written, oral, and graphical communication in both technical and non-technical environments
ELO-05	An ability to communicate in English
ELO-06	An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting
ELO-07	A recognition of the need for continuous learning, and an ability to engage in life-long learning
ELO-08	An ability to understand the tenants of professional codes of ethics and to apply ethical considerations to realistic problems
ELO-09	Recognize the importance of the global, economic, environmental and societal context in engineering practice
ELO-10	An ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments related to electronics and communication engineering technology
ELO-11	Demonstrate the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering technology standards to the building, testing, operation, and maintenance of electronics/communication systems

8- Reference points used to inform the programme specification

- The CDIO-based education that engineering graduates should be able to Conceive – Design Implement – Operate engineering systems.
- Stakeholders’ surveys

9- Blocks of knowledge in the whole programme:150 credits (without Physical Education and National Defense Education knowledge)

10- Block of knowledge

Name	Credits			
	Total	Compulsion		Elective
		Theory	Practice	
General knowledge	56	48	02	06
Political Education	12	12		0
Social Science	06	0		06
English	09	09		0

Mathematics and Natural Sciences	23	22	01	0
Informatics	03	03		0
Introduction to ECET	03	02	01	0
Professional knowledge	94	66	19	09
Electrical and Electronics Core	26	19	07	0
Electrical and Electronics Advanced Core	23	18	05	0
Electronics and Communications Specialization	33	19	05	9
Graduation Thesis and Internship	12	00	12	0
Total	150	104	31	15

11- Programme content

a. General knowledge: 56 Credits

No.	Course Prefix and Number	Course Title	Credits	
			Theory	Practice
A	Political Education and General Laws		12	0
1	LLCT150105	Principles of Marxist-Leninism	5	0
2	LLCT120314	Ho Chi Minh's Ideology	2	0
3	LLCT230214	Vietnamese Communist Party Policy of Revolution	3	0
4	GELA220405	General Laws	2	0
B	Introduction to ECET		2	1
1	IEET130145	Introduction to ECET	2	1
C	Informatics		3	0
1	CPRL130064	C Program Language	3	0
D	Foreign Language		9	0
1	ENGL130137	English 1	3	0
2	ENGL230237	English2	3	0
3	ENGL330337	English 3	3	0
E	Mathematics and Natural Sciences		22	1
1	MATH130101	Advanced Mathematics 1	3	0
2	MATH130201	Advanced Mathematics 2	3	0
3	MATH130301	Advanced Mathematics 3	3	0
4	MATH130401	Applied Probability	3	0
5	PHYS120102	General Physics A1	3	0
6	PHYS120202	General PhysicsA2	2	1
7	MATH121201	Complex Functions and Laplace Transforms	2	0
8	GCHE130103	General Chemistry A1	3	0

F	Social Science (Select 03 free elective courses)		6	0
1	GEEC220105	General Economics	2	0
2	PLSK320605	Planning Skill	2	0
3	INMA220305	Introduction to Management	2	0
4	INSO321005	Introduction to Sociology	2	0
5	IQMA220205	Introduction to Quality Management	2	0
6	INLO220405	Introduction to Logic	2	0
7	PRSK320705	Presentation Skills	2	0
8	SYTH220505	Systems Thinking	2	0
9	ULTE121105	University Learning Method	2	0
10	IVNC320905	Vietnamese Culture	2	0
11	TDTS320805	Technical Writing	2	0
G	Physical Education		5*	0
1	PHED110513	Physical Education 1	1	0
2	PHED110613	Physical Education 2	1	0
3	PHED130715	Physical Education 3 (Elective)	3	0
H	National Defense Education		11*	0

**Note: Credits of National Defense Education and Physical Education 1- 3 are not included in total 150 credits of the programme*

b. Professional education knowledge: 94 credits

No.	Course Prefix and Number	Course Title	Credits	
			Theory	Practice
A	Electrical and Electronics Core		17	7
1	ELCI140144	Electric Circuit	4	0
2	BAEL340662	Basic Electronics	4	0
3	DIGI330163	Digital Systems	3	0
4	EMIN330244	Electrical Measurement and Instruments	3	0
5	MICR330363	Microprocessor	3	0
6	ELSA320245	Electrical Safety	2	0
7	ELPR320762	Electronics Lab	0	2
8	PMEM310844	Measurement Engineering Lab	0	1
9	PRDI320263	Digital Systems Lab	0	2
10	PRMI320463	Microprocessor Lab	0	2
B	Electrical and Electronics Advanced Core		18	5

1	SISY330164	Signals and Systems	3	0
2	DACO430664	Data Communication	3	0
3	DSPR431264	Digital Signal Processing	3	0
4	COEL330264	Communication Electronics	3	0
5	DSIC330563	Digital Systems Design with HDLs	3	0
6	EMSY437764	Embedded Systems	3	0
7	LDAT411164	Data Communication Lab	0	1
8	PRDS320663	Digital Systems Design with HDLs Lab	0	2
9	ESPR427064	Embedded Systems Lab	0	2
C	Electronics and Communications Specialization		28	05
C.1	<i>Integrated-Circuits and Communications Area</i>			
I	<i>Compulsory Courses</i>		<i>19</i>	<i>5</i>
1	ELFI220344	Electromagnetic Field	2	0
2	MIEN330364	Microwave Engineering	3	0
3	COSY330464	Communication Systems	3	0
4	AWPR330964	Antennas and Propagation	3	0
5	WCSY431364	Wireless Communication Systems	3	0
6	DICD436264	Digital Integrated Circuits Design	3	0
7	LDSP412564	Digital Signal Processing Lab	0	1
8	COSL420764	Communication Systems Lab	0	2
9	WCSL422664	Wireless Communication Systems Lab	0	2
10	PRTE411464	Project 1	1	0
11	PRTE411664	Project 2	1	0
II	<i>Elective courses</i>		<i>9</i>	<i>0</i>
1	MOCO431864	Mobile Communication	3	0
2	MICI431964	Microwave Circuits	3	0
3	FOCO432064	Optical Communication	3	0
4	INTH422164	Information Theory	2	0
5	DICO432264	Digital Communication	3	0
6	IMPR432463	Image Processing	3	0
7	AUVI321563	Audio and Video Engineering	2	0

8	TETM423164	Advanced Topics in Communication	2	0
9	ITFA436064	Internet of Things: Foundations and Applications	3	0
10	AICD433164	Analog Integrated Circuit Design	3	0
11	CONE337764	Computer and Communication Networks	3	0
C.2	<i>Industrial Electronics Area</i>			
I	<i>Compulsory Courses</i>		<i>19</i>	<i>05</i>
1	POEL330262	Power Electronics	3	0
2	ACSY330346	Automatic Control Systems	3	0
3	ELEQ220944	Electrical Equipment	2	0
4	PLCS330846	Programmable Logic Controller	3	0
5	ELPS330345	Electrical Power System	3	0
6	IMPR432463	Image Processing	3	0
7	ELPR210644	Electric Lab	0	1
8	POEP320262	Power Electronics Lab	0	2
9	PPLC321346	Programmable Logic Controller Lab	0	2
10	ELPR310863	Project 1	1	0
11	ELPR310963	Project 2	1	0
II	<i>Elective courses</i>		<i>9</i>	<i>0</i>
1	SCDA420946	SCADA Systems	2	0
2	RFID321363	RFID Technology	2	0
3	ADMI320763	Advanced Microprocessor	3	0
4	INCO321546	Intelligent Control	2	0
5	IDMA322245	Industry Management	2	0
6	NANO321463	Nano Technology	2	0
7	PLCN422946	Industrial Communication Network	2	0
8	NETT321263	Research in Modern Electronics Technology	2	0
9	ELDA323245	Electric Drive and Application	2	0
10	AUVI321563	Audio and Video Engineering	2	0
11	MALE331063	Machine Learning	3	0
12	BISI331863	Bio-Signal and -Image Processing	3	0
13	SETE331963	Sensor Technology	3	0
D	Internship and Thesis		0	12

D.1	Integrated-Circuits and Communications Electives			
1	GRPR423064	Internship	0	2
2	GRPR403264	Thesis	0	10
D.2	Industrial Electronics Area			
1	GRPR324463	Internship	0	2
2	GRAD401663	Thesis	0	10

12- Teaching plan

1st Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
1	CPRL130064	C program language	3	
2	ENGL130137	English 1	3	
3	MATH130101	Advanced Mathematics 1	3	
4	MATH130201	Advanced Mathematics 2	3	
5	PHYS130102	General Physics A1	3	
6	INMA133164	Introduction to ECET	3	
7	PHED110513	Physical education 1	0	
8	LLCT150105	Fundamental principles Marxism – Leninism	5	
	Total		23	

2nd Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
1	ENGL230237	English 2	3	
2	MATH130301	Advanced Mathematics 3	3	MATH130101
3	MATH121201	Complex variable functions & Laplace transforms	2	MATH130101
4	MATH130401	Applied statistics probability	3	MATH130101
5	PHYS120202	General Physics A2	2	
6	PHYS110302	Physics experiment	1	PHYS130102
7	PHED110613	Physical education 2	0	
8	ELCI140144	Electric circuit	4	MATH130101
9	GCHE130103	General Chemistry A1	3	
	Total		21	

3rd Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
1	ENGL330337	English 3	3	
2	ELSA320245	Electrical Safety	2	ELCI140144
3	LLCT120314	Ho Chi Minh's ideology	2	
4	SISY330164	Signals and Systems	3	MATH130101
5	BAEL340662	Basic Electronics	4	ELCI140144
6	EMIN330244	Electrical measurement and instruments	3	ELCI140144
7	PHED130715	Physical education 3	0	
	<i>Integrated-Circuits And Communications Area</i>			
8	ELFI220344	Electromagnetic Field	2	MATH130101
	<i>Industrial Electronics Area</i>			

8	ELEQ220944	Electrical Equipment	2	ELCI140144
	Total		19	

4th Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
1	DIGI330163	Digital Systems	3	BAEL340662
2	DACO430664	Data Communication	3	SISY330164
3	DSPR431264	Digital Signal Processing	3	SISY330164
4	ELPR320762	Electronics Lab	2	BAEL340662
5	PMEM310844	Measurement Engineering Lab	1	EMIN330244
	<i>Integrated-Circuits And Communications Area</i>			
6	MIEN330364	Microwave Engineering	3	ELFI220344
	<i>Industrial Electronics Area</i>			
6	ELPS330345	Electrical Power System	3	ELEQ220944
	<i>Free Electives (4 Credits)</i>			
7	TDTS320805	Technical Writing	2	
8	PLSK320605	Planning Skills	2	
9	INLO220405	Introduction to Logic	2	
10	PRSK320705	Presentation Skills	2	
11	SYTH220505	System Thinking	2	
12	ULTE121105	University Learning Method	2	
	Total		19	

5th Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
1	MICR330363	Microprocessor	3	DIGI330163
2	DSIC330563	Digital Systems Design with HDLs	3	DIGI330163
3	PRDI320263	Digital Systems Lab	2	DIGI330163
4	LDAT411164	Data Communication Lab	1	DACO430664
5	GELA220405	General law	2	
	<i>Integrated-Circuits And Communications Area</i>			
6	AWPR330964	Antennas and Propagation	3	ELFI220344
7	COSY330464	Communication Systems	3	BMIE330364
8	LDSP412564	Digital Signal Processing Lab	1	DSPR431264
	<i>Industrial Electronics Area</i>			
6	POEL330262	Power Electronics	3	BAEL340662
7	ACSY330346	Automatic Control Systems	3	MATH121201
8	ELPR210644	Electric Lab	1	ELPS330345
	<i>Free Electives (2 Credits)</i>			
9	GEEC220105	General Economics	2	
10	INSO321005	Introduction to Sociology	2	
11	IQMA220205	Introduction to Quality Management	2	
12	INMA220305	Introduction to Management	2	
13	IVNC320905	Vietnamese Culture	2	
	Total		20	

6th Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
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1	EMSY437764	Embedded Systems	3	MICR330363
2	COEL330264	Communication Electronics	3	BAEL340662
3	PRMI320463	Microprocessor Lab	2	MICR330363
4	PRDS320663	Digital Systems Design with HDLs Lab	2	DSIC330563
5	LLCT230214	VN Communist Party Policy of Revolution	3	
<i>Integrated-Circuits And Communications Area</i>				
6	WCSY431364	Wireless Communication Systems	3	TESY330464
7	COSL420764	Communication Systems Lab	2	TESY330464
8	PRTE411464	Project 1	1	
<i>Industrial Electronics Area</i>				
6	PLCS330846	Programmable Logic Controller	3	MICR330363
7	POEP320262	Power Electronics Lab	2	POEL330262
8	ELPR310863	Project 1	1	
Total			19	

7th Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
1	ESPR427064	Embedded Systems Lab	2	EMSY437764
<i>Integrated-Circuits And Communications Area</i>				DSIC330563
2	DICD436264	Digital Integrated Circuits Design	3	DSIC330563
3	WCSL422664	Wireless Communication Systems Lab	2	TESY431364
4	PRTE411664	Project 2	1	
<i>Integrated-Circuits And Communications Electives (9 Credits)</i>				
5	MOCO431864	Mobile Communication	3	TESY431364
6	MICI421964	Microwave Circuits	2	BMIE3303644
7	FOCO432064	Optical Communication	3	TESY330464
8	INTH422164	Information Theory	2	TESY330464
9	DICO432264	Digital Communication	3	TESY330464
10	IMPR432463	Image Processing	3	SISY330164
11	AUVI321563	Audio And Video Engineering	2	TESY431364
12	TETM423164	Advanced Topics In Communication	2	DACO430664
13	ITFA436064	Internet of Things: Foundations and Applications	3	BAEL340662
14	AICD433164	Analog Integrated Circuit Design	3	SISY330164
15	CONE337764	Computer and Communication Networks	3	DACO43066
<i>Industrial Electronics Area</i>				
2	IMPR432463	Image Processing	3	SISY330164
3	PPLC321346	Programmable Logic Controller Lab	1	PLCS330846
4	ELPR310963	Project 2	1	
<i>Industrial Electronics Electives (9 Credits)</i>			4	
5	SCDA420946	SCADA Systems	2	PLCS330846
6	RFID321363	RFID Technology	2	ELCI140144
7	SETE331963	Sensor Technology	2	BAEL340662
8	ADMI320763	Advanced Microprocessor	2	MICR330363
9	INCO321546	Intelligent Control	2	MICR330363
10	IDMA322245	Industry Management	2	ACSY330346
11	NANO321463	Nano Technology	2	

12	PLCN422946	Industrial Communication Network	2	BAEL340662
13	NETT321263	Research In Modern Electronics Technology	2	DACO43066
14	ELDA323245	Electric Drive And Application	2	
15	AUVI321563	Audio And Video Engineering	2	SISY330164
16	MALE331063	Machine Learning	2	IMPR432463
17	BISI331863	Bio-Signal And -Image Processing	2	IMPR432463
	Total		17	

8th Semester

No.	Course Prefix and Number	Course Title	Cr.	Pre-requisite
	<i>Integrated-Circuits And Communications Electives</i>			
1	GRPR423064	Internship	2	
2	GRPR403264	Thesis	10	
	<i>Industrial Electronics Area</i>			
1	GRPR324463	Internship	2	
2	GRAD401663	Thesis	10	
	Total		12	

13- Progression points

- Students must obtain a mark of 5.0 out of 10.0 for all courses. In cases where a student has failed to meet a requirement to progress (A minimum cumulative GPA of 3.0 for the first year, or 3.5 for the second year, or 4.0 for the third year or 4.5 from the fourth year or over allowable study time) he or she will be required to withdraw from the programme and a recommendation will be made to the Academic Affairs Office for an intermediate award where appropriate.

14- Career prospects

- Our programme provides a solid foundation in high technology problem-solving and enables engineers to expand their careers into other fields. A degree in Electronics and Communications Engineering from HCMC University of Technology and Education opens the door to a wide range of career opportunities: computer embedded systems, medical electronics, consumer electronics, industrial electronics, robotics, mobile communication networks, power generation, security, transport, and design consultancy. Our graduates command some of the highest graduate starting salaries and are always in demand for internships and graduate positions with companies ranging from large multinationals to one-person start-ups.
- The career outlook is great for electronics and communications engineers. Electronics engineering and communications engineering are some of the fastest growing career fields in Vietnam. The electronics and communications engineers are not only highly respected, they are highly paid: starting salaries are typically near \$600 for entry-level engineering jobs for bachelor's degree graduates.
- A large number of employers hire graduates from our program, some of the most recognized employers are: Renesas Design Vietnam, Samsung Vina Electronics, Robert Bosch Engineering Vietnam, eSilicon Vietnam, Intel Vietnam, Applied Micro Vietnam, Microchip Vietnam, Viettel Telecom, FPT Telecom, VNPT, SCTV, Mobifone and so on. Careers are many and varied and include Design Engineer, Systems Engineer, Medical Physicist, Postdoctoral Research Scientist and Radio Frequency Scientist. Some of our graduates go on to work in the industrial sector, in government and in education.

The programme was issued in August 2012 and last revised in June 2016.