

Electronics and Communication Engineering (EC)

Curriculum Outline

Electronics and Communication Engineering are among the most challenging fields of study in electrical engineering. The areas of study in electronics and communication engineering are quite diverse. The curriculum is therefore developed to include many major study areas so that the student will be well prepared for work in the highly competitive electronics and communication engineering professions.

The compulsory courses are designed to provide students broad knowledge in electronics and communication engineering, which is necessary to satisfy the general needs of the industrial sectors in Thailand. The compulsory courses include four laboratory courses in electrical engineering, which are provided to illustrate practical aspects of electric circuits, electronics, feedback control, signal processing and communication. By the end of the third year, the student will complete the study of most compulsory courses, except for courses related to seminar and senior project, which will be taken in the fourth year.

After gaining sufficient basic knowledge through the compulsory courses, students can choose compulsory elective courses provided in three major areas: Communications, Electronics, and Mechatronics, in the fourth year. The Communications Area concentrates the study on advanced communication systems such as optical and mobile communication systems. While, the Electronics Area focuses on solid state technology, microelectronics and advanced electronic circuit design. Last, the Mechatronics Area provides fundamental and intermediate courses in mechatronics, robotics, and advanced control systems.

In addition, courses for topics in communications are also offered as technical elective courses in order to cope with the rapid changing in technology and the highly diverse areas of study in communication engineering. During the last semester, students has options to go for an exchange abroad, to participate in extended training program with leading local companies, or to work on senior project with SIIT advisors.

Structure and Components

1. General Basic Courses	51 Credits
1.1 Humanities	6 Credits
1.2 Social Sciences	6 Credits
1.3 English Language	9 Credits
1.4 Science and Mathematics	30 Credits
2. Core Courses	93 Credits
2.1 Compulsory Courses	75 Credits
2.2 Compulsory Elective Courses	12 Credits
2.3 Technical Elective Courses	6 Credits
3. Free Elective Courses	6 Credits
Total	<u>150</u> Credits

Details of the Curriculum

1. General Basic Courses and Basic Courses in Science and Mathematics	51 Credits
1.1 Humanities (2 courses) TU 110 TU 140	6 Credits
1.2 Social Sciences (2 courses) EC 210 TU 120	6 Credits
1.3 English Language (3 courses) EL 171 EL 172 EL 210	9 Credits
1.4 Science and Mathematics (12 courses) GTS 132 GTS 133 MAS 116 MAS 117 MAS 210 SCS 126 SCS 138 SCS 139 SCS 176 SCS 183 SCS 184 TU 130	30 Credits
2. Core Courses	93 Credits
2.1 Compulsory Courses (28 courses)	75 Credits
EMS 211 GTS 302 IES 303 ITS 050 MCS 352 MES 351 ECS 310 ECS 313 ECS 315 ECS 316 ECS 317 ECS 318 ECS 319 ECS 320 ECS 321 ECS 331 ECS 332 ECS 361 ECS 370 ECS 371 ECS 372 ECS 380 ECS 381 ECS 382 ECS 395 ECS 396 ECS 450 ECS 472 ((ECS 398 and ECS 300) or (ECS 399) or (ECS 496 and ECS497 and ECS 300))	
2.2 Compulsory Elective Courses Select 4 courses (12 credits) from the following courses:	12 Credits
ECS 322 ECS 323 ECS 424 ECS 425 ECS 427 ECS 431 ECS 441 ECS 442 ECS 451 ECS 452 ECS 455 ECS 456 ECS 462 ECS 475 ECS 477 ECS 478 ECS 483 MCS 321 MCS 361 MCS 451 MCS 483	
2.3 Technical Elective Courses Select 6 credits from the list of courses offered by SIIT, except basic courses. XXS xxx	6 Credits
3. Free Elective Courses	6 Credits
Select any courses offered by the university, except basic courses. XXX xxx	

Total Credit Requirement 150 Credits

EC Curriculum : 150 Credits

First Year

Semester I Credits (lecture-practice-self study hrs)

EL	171	English Course II	3(3-1-5)
ITS	050	Intro. to Computers and Programming	3(2-3-4)
MAS	116	Mathematics I	3(3-1-5)
SCS	126	Chemistry for Engineers	3(3-1-5)
SCS	138	Applied Physics I	3(3-1-5)
SCS	176	Chemistry Laboratory	1(0-3-0)
SCS	183	Physics Laboratory I	1(0-3-0)
TU	130	Integrated Science and Technology	3(3-0-6)
		Sub-Total	20(17-13-30)

Semester II

EL	172	English Course III	3(3-1-5)
GTS	132	Introduction to Life Science	3(3-1-5)
GTS	133	Environmental Studies	3(2-2-5)
MAS	117	Mathematics II	3(3-1-5)
SCS	139	Applied Physics II	3(3-1-5)
SCS	184	Physics Laboratory II	1(0-3-0)
TU	140	Thai Studies	3(3-0-6)
		Sub-Total	19(17-9-31)

Second Year

Semester I Credits (lecture-practice-self study hrs)

ECS	313	Electrical Engineering Mathematics	3(3-0-6)
ECS	316	Circuit Analysis	3(3-1-5)
ECS	317	Computer Graphics and Tools in Electrical Engineering	3(2-2-5)
EL	210	English for Engineering I	3(3-1-5)
MAS	210	Mathematics III	3(3-1-5)
MES	351	Engineering Dynamics	3(3-1-5)
TU	120	Integrated Social Science	3(3-0-6)
		Sub-Total	21(20-6-37)

Semester II

ECS	310	Basic Electrical Engineering Laboratory	1(0-3-0)
ECS	318	Data Structures, Algorithms, and Object Oriented Programming	3(2-2-5)
ECS	321	Electronic Circuits I	3(3-0-6)
ECS	331	Electromagnetics	3(3-0-6)
ECS	361	Electrical Measurement and Instrumentation	3(3-0-6)
ECS	371	Digital Circuits	3(3-0-6)
ECS	372	Signals and Systems	3(3-0-6)
GTS	302	Technical Writing	2(2-1-3)
		Sub-Total	21(19-6-38)

EC Curriculum : 150 Credits

Third Year

Semester I

EC 210	Introductory Economics	3(3-1-5)
ECS 315	Probability and Random Processes	3(3-0-6)
ECS 319	Java Programming	3(2-2-5)
ECS 320	Electronic Circuits Laboratory	1(0-3-0)
ECS 332	Principles of Communications	3(3-0-6)
ECS 370	Digital Circuit Laboratory	1(0-3-0)
ECS 381	Feedback Control Systems	3(3-0-6)
ECS 382	Microprocessors	3(3-0-6)
	Sub-Total	20(17-9-34)

Semester II

ECS 380	Feedback Control Laboratory	1(0-3-0)
ECS 450	Signal Processing and Communication Laboratory	1(0-3-0)
ECS 472	Digital Signal Processing	3(3-0-6)
E/M-CS xxx	Compulsory Elective Course	3(3-0-6)
EMS 211	Thermofluids	3(3-1-5)
MCS 352	Microcontroller and Computer Interfacing	3(3-0-6)
TU 110	Integrated Humanities	3(3-0-6)
XXS xxx	Technical Elective	3(x-x-x)
	Sub-Total	20(x-x-x)

Summer

ECS 300	Electronics and Communication Engineering Training	0(0-0-0)
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Remark

Students, who take ECS 399 Extended Electronics and Communication Engineering Training in their last semester, are exempted from ECS 300 Electronics and Communication Engineering Training and are advised to complete 6 credits of Free Electives by the first semester of their fourth year.

Fourth Year

Semester I

ECS 395	Seminar	1(0-3-0)
ECS 396	Project Development	1(0-3-0)
E/M-CS xxx	Compulsory Elective Courses	3(3-0-6)
E/M-CS xxx	Compulsory Elective Courses	3(3-0-6)
E/M-CS xxx	Compulsory Elective Courses	3(3-0-6)
IES 303	Engineering Management and Cost Analysis	3(3-0-6)
XXS xxx	Technical Elective	3(x-x-x)
	Sub-Total	17(x-x-x)

List of Compulsory Elective Courses

Communications Area

ECS 441	Communication Electronics	3(3-0-6)
ECS 442	Microwave Principles	3(3-0-6)
ECS 451	Data Communications and Networks	3(3-0-6)
ECS 452	Digital Communication Systems	3(3-0-6)
ECS 455	Mobile Communications	3(3-0-6)
ECS 456	Optical Communications	3(3-0-6)
ECS 462	Antennas	3(3-0-6)
ECS 477	Signal Processing for Communication Systems	3(3-0-6)

Electronics Area

ECS 322	Electronic Circuits II	3(3-0-6)
ECS 323	Physical Electronics	3(3-0-6)
ECS 424	Analog Integrated Circuits	3(3-0-6)
ECS 425	Digital Integrated Circuits	3(3-0-6)
ECS 427	Introduction to VLSI Design	3(3-0-6)
ECS 431	Industrial Electronics	3(3-0-6)

Mechatronics Area

ECS 478	Introduction to Computer Vision and Pattern Recognition	3(3-0-6)
ECS 475	Digital Image Processing	3(3-0-6)
ECS 483	Linear System Theory	3(3-0-6)
MCS 321	Real-time and Embedded Systems	3(3-0-6)
MCS 361	Mechatronic Instrumentation	3(3-0-6)
MCS 451	Introduction to Robotics	3(3-0-6)
MCS 483	Dynamic Systems and Control	3(3-0-6)

Semester II

(a) ECS 398	Senior Project	6(0-18-0)
or		
(b) ECS 399	Extended Electronics and Communication Engineering Training	6(0-40-0)
or		
(c) ECS 496	Special Study in EC I	3(3-0-6)
(c) ECS 497	Special Study in EC II	3(3-0-6)
and		
XXX xxx	Free Electives	3(x-x-x)
XXX xxx	Free Electives	3(x-x-x)
	Sub-Total	12(x-x-x)