

## ELECTRONICS AND COMMUNICATION ENGINEERING (EC)

### Curriculum Outline

Electronics and Communication Engineering is 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 several major study areas so that students will be well prepared for work in the highly competitive electronics and communication engineering professions.

The compulsory courses are designed to provide students with 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.

After gaining sufficient basic knowledge through the compulsory courses, students can choose technical elective courses provided in three major areas: Communications, Electronics, and Mechatronics, in the fourth year. The Communications Area concentrates on the study on advanced communication systems, such as optical and mobile communication systems. The Electronics Area focuses on solid state technology, microelectronics, and advanced electronic circuit design. The Mechatronics Area provides fundamental and intermediate courses in mechatronics, robotics, and advanced control systems. These technical elective courses are offered to cope with the rapid changes in technology and the highly diverse areas of study in electronics and communication engineering. During the last semester, students can choose from three main options: academic exchange programs abroad, extended training programs with leading local companies, or senior projects with SIIT advisors.

### Structure and Components

<b>1. General Basic Courses</b>	<b>30</b>	<b>Credits</b>
1.1 Part I	21	Credits
1.1.1 Humanities	2	Credits
1.1.2 Social Sciences	5	Credits
1.1.3 Languages	9	Credits
1.1.4 Science and Mathematics	5	Credits
1.2 Part II	9	Credits
<b>2. Core Courses</b>	<b>114</b>	<b>Credits</b>
2.1 Compulsory Courses	108	Credits
2.2 Technical Elective Courses	6	Credits
<b>3. Free Elective Courses</b>	<b>6</b>	<b>Credits</b>
<b>Total</b>	<b>150</b>	<b>Credits</b>

### Details of the Curriculum

<b>1. General Basic Courses</b>	<b>30</b>	<b>Credits</b>
1.1 Part I	21	Credits
1.1.1 Humanities (1 course) TU110	2	Credits
1.1.2 Social Sciences (2 courses) TU100      TU120	5	Credits
1.1.3 Languages (3 courses) EL171      EL172      TU140	9	Credits
1.1.4 Science and Mathematics ITS100      TU130	5	Credits
1.2 Part II	9	Credits
GTS132      GTS133      GTS202		
<b>2. Core Courses</b>	<b>114</b>	<b>Credits</b>
2.1 Compulsory Courses	108	Credits
2.1.1 Science and Mathematics	21	Credits
MAS116      MAS117      MAS210      SCS126		
SCS138      SCS139      SCS176      SCS183		
SCS184		
2.1.2 Non-EC Courses	17	Credits
GTS302      IES303      MES211      MES300		
MES351      MES371		
2.1.3 EC Courses (27-29 courses)	70	Credits
ECS210      ECS213      ECS216      ECS217		
ECS218      ECS231      ECS233      ECS261		
ECS281      ECS315      ECS320      ECS322		
ECS332      ECS370      ECS371      ECS380		
ECS381      ECS382      ECS396      ECS442		
ECS450      ECS451      ECS452      ECS456		
ECS462      ECS472		
((ECS398 and ECS300) or (ECS399) or (ECS496 and ECS497 and ECS300))		
2.2 Technical Elective Courses	6	Credits
Select 6 credits from the list of courses offered by Electronics and Communication Engineering Program, except basic courses. ECSxxx      ECSxxx		
<b>3. Free Elective Courses</b>	<b>6</b>	<b>Credits</b>
Students may choose any free elective courses (not less than 6 credits in total) including general basic courses, except:		
1. General basic courses in Science and Mathematics		
2. All general basic TU courses in both part 1 and part 2		
<b>Total Credit Requirement</b>	<b>150</b>	<b>Credits</b>

## EC CURRICULUM : 150 CREDITS

### Course Credits (lecture-practice-self study hrs)

#### First Year

##### **Semester I**

EL171	English Course II	3(3-0-6)
GTS132	Introduction to Biological Science	3(3-0-6)
MAS116	Mathematics I	3(3-0-6)
SCS126	Chemistry for Engineers	3(3-0-6)
SCS138	Applied Physics I	3(3-0-6)
SCS176	Chemistry Laboratory	1(0-3-0)
SCS183	Physics Laboratory I	1(0-3-0)
TU100	Civic Education	3(3-0-6)
TU130	Integrated Sciences and Technology	2(2-0-4)

**Sub-Total 22(20-6-40)**

##### **Semester II**

EL172	English Course III	3(3-0-6)
GTS133	Environmental Studies	3(2-2-5)
ITS100	Introduction to Computers and Programming	3(2-3-4)
MAS117	Mathematics II	3(3-0-6)
SCS139	Applied Physics II	3(3-0-6)
SCS184	Physics Laboratory II	1(0-3-0)
TU140	Thai Studies	3(3-0-6)

**Sub-Total 19(16-8-33)**

#### Second Year

##### **Semester I**

ECS213	Electrical Engineering Mathematics	3(3-0-6)
ECS216	Circuit Analysis	3(3-0-6)
ECS217	Computer Tools in EE	1(0-3-0)
GTS202	English Language Structures	3(3-0-6)
MAS210	Mathematics III	3(3-0-6)
MES351	Engineering Dynamics	3(3-0-6)
TU120	Integrated Social Sciences	2(2-0-4)

**Sub-Total 18(17-3-34)**

##### **Semester II**

ECS210	Basic Electrical Engineering Laboratory	1(0-3-0)
ECS218	Data Structures, Algorithms, and Object Oriented Programming	3(2-2-5)
ECS231	Electronic Circuits I	3(3-0-6)
ECS233	Electromagnetics	3(3-0-6)
ECS261	Electrical Measurement and Instrumentation	3(3-0-6)
ECS281	Signals and Systems	3(3-0-6)
ECS371	Digital Circuits	3(3-0-6)
GTS302	Technical Writing	2(2-1-3)

**Sub-Total 21(19-6-38)**

#### Third Year

##### **Semester I**

ECS315	Probability and Random Processes	3(3-0-6)
ECS322	Electronic Circuits II	3(3-0-6)
ECS370	Digital Circuit Laboratory	1(0-3-0)
ECS381	Feedback Control Systems	3(3-0-6)
MES211	Thermofluids	3(3-1-5)
MES300	Engineering Drawing	3(2-3-4)
TU110	Integrated Humanities	2(2-0-4)

**Sub-Total 18(16-7-31)**

### Course Credits (lecture-practice-self study hrs)

#### **Semester II**

ECS320	Electronic Circuits Laboratory	1(0-3-0)
ECS332	Principles of Communications	3(3-0-6)
ECS380	Feedback Control Laboratory	1(0-3-0)
ECS382	Microprocessors	3(3-0-6)
ECS451	Data Communications and Networks	3(3-0-6)
ECS472	Digital Signal Processing	3(3-0-6)
ECSxxx	Technical Elective	3(x-x-x)
MES371	Material Science for Engineers	3(3-0-6)

**Sub-Total 20(x-x-x)**

#### **Summer**

Select either Senior Project Track, Foreign Exchange Track, or Extended Training Track.

##### **1. Senior Project Track and Foreign Exchange Track**

ECS300	Electronics and Communication Engineering Training	0(0-0-0)
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**Sub-Total 0(0-0-0)**

##### **2. Extended Training Track**

XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)

**Sub-Total 6(x-x-x)**

#### Fourth Year

##### **Semester I**

ECS396	Project Development	1(0-3-0)
ECS442	Microwave Principles	3(3-0-6)
ECS450	Signal Processing and Communication Laboratory	1(0-3-0)
ECS452	Digital Communication Systems	3(3-0-6)
ECS456	Optical Communications	3(3-0-6)
ECS462	Antennas	3(3-0-6)
ECSxxx	Technical Elective	3(x-x-x)
IES303	Engineering Management and Cost Analysis	3(3-0-6)

**Sub-Total 20(x-x-x)**

##### **Semester II**

##### **1) Senior Project Track**

ECS398	Electrical and Communication Engineering Project	6(0-18-0)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)

**Sub-Total 12(x-x-x)**

##### **2) Foreign Exchange Track**

ECS496	Special Study in EC I	3(3-0-6)
ECS497	Special Study in EC II	3(3-0-6)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)

**Sub-Total 12(x-x-x)**

##### **3) Extended Training Track**

ECS399	Extended Electronics and Communication Engineering Training	6(0-40-0)
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**Sub-Total 6(0-40-0)**