

Electrical Engineering (EE)

Curriculum Outline

The areas of study in electrical engineering are quite diverse. The curriculum is therefore developed to provide fundamental knowledge in several major study areas so that students will be well-prepared for work in the highly competitive and fast-moving electrical engineering professions.

The compulsory courses are designed to provide students a broad understanding of the principles, illustrated by current applications, in electrical engineering. The compulsory courses include four laboratory courses, providing hands-on learning of electric circuits, digital circuits, electronics, and feedback control. They also include two project design courses emphasizing the applications of the principles under the framework of the CDIO (conceiving, designing, implementing, and operating) process.

By the end of the first semester of their third year, students complete the study of most compulsory courses. The students then choose to study in one of the two options: communication engineering or power engineering. Each option include one laboratory course and six lecture courses covering several important areas in the corresponding options. Furthermore, through technical elective courses, students can further extend their knowledge with courses from another option and/or explore topics in other areas such as electronics or mechatronics.

In 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. The last two options provide a project-based learning opportunity, in which students must integrate and apply the knowledge they have acquired throughout their study in the program.

Structure and Components

1. General Basic Courses	30 Credits
1.1 Part I	21 Credits
1.1.1 Social Sciences	6 Credits
1.1.2 Humanities	3 Credits
1.1.3 Science and Mathematics	3 Credits
1.1.4 Languages	9 Credits
1.2 Part II	9 Credits
2. Major Courses	114 Credits
2.1 Basic Courses	38 Credits
2.1.1 Basic Mathematics and Science Courses	21 Credits
2.1.2 Basic Engineering Courses	17 Credits
2.2 Specialized Courses	76 Credits
2.2.1 Compulsory Engineering Courses	64 Credits
2.2.2 Elective Engineering Courses	12 Credits
3. Free Elective Courses	6 Credits
Total	<u>150 Credits</u>

Details of the Curriculum

1. General Basic Courses	30 Credits
1.1 Part I	21 Credits
1.1.1 Social Sciences (2 courses)	6 Credits
TU100 TU101	
1.1.2 Humanities (1 course)	3 Credits
TU102	
1.1.3 Science and Mathematics (1 course)	3 Credits
TU103	
1.1.4 Languages (3 courses)	9 Credits
TU104 TU105 TU106	
1.2 Part II	9 Credits
GTS133 GTS202 ITS100	
2. Major Courses	114 Credits
2.1 Basic Courses	38 Credits
2.1.1 Basic Mathematics and Science Courses	21 Credits
MAS116 MAS117 MAS210 SCS126	
SCS138 SCS139 SCS176 SCS183	
SCS184	
2.1.2 Basic Engineering Courses	17 Credits
GTS302 IES303 MES211 MES300	
MES351 MES371	
2.2 Specialized Courses	76 Credits
2.2.1 Compulsory Engineering Courses	64 Credits
• Communication Engineering	
2.2.1.1 Basic Electrical Engineering	
EES 210 EES 211 EES 212 EES 216	
EES 221 EES 281 EES 298 EES 315	
EES 330 EES 331 EES 332 EES 341	
EES 370 EES 371 EES 380 EES 381	
EES 382 EES 398	
2.2.1.2 Communications Theory	
EES 351	
2.2.1.3 Signal Processing	
EES 472	
2.2.1.4 Communication Devices and Transmission Lines	
EES 450 EES 454	
2.2.1.5 Communication systems and Networks	
EES 451 EES 452 EES 455 EES 457	
• Power Engineering	
2.2.1.1 Basic Electrical Engineering	
EES 210 EES 212 EES 216 EES 221	
EES 281 EES 298 EES 315 EES 330	
EES 331 EES 332 EES 351 EES 370	
EES 371 EES 382 EES 398	
2.2.1.2 Measurement, Instrument and Control System	
EES 211 EES 380 EES 381	
2.2.1.3 Energy Conversion and Transportation	
EES 340 EES 341 EES 445 EES 446	
2.2.1.4 Electrical System, High Voltage Engineering, and Installation Standard	
EES 342 EES 441 EES 442 EES 448	
2.2.2 Elective Engineering Courses	12 Credits
2.2.2.1 Special Study	6 Credits
Select one of the following tracks	
• Senior Project Track	
EES 300 EES 498	
• Foreign Exchange Track	
EES300 EES 496 EES 497	
• Extended Training Track	
EES 499	
2.2.2.2 Technical Elective courses	6 Credits
Select 6 credits from the list of courses offered by Electrical Engineering Program, except basic courses.	
EESxxx EESxxx	
3. Free Elective Courses	6 Credits
Students may choose any free elective courses (not less than 6 credits in total) offered by SIIT or TU, including general basic courses, except:	
1. General basic courses in Science and Mathematics.	
2. General basic TU courses.	
3. Courses with contents similar to those of other courses in the curriculum already taken by the students.	
Total Credit Requirement	<u>150 Credits</u>

EE Curriculum : 150 Credits

Course Credits (lecture-practice-self study hours)

First Year

Semester I

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)
TU104	Critical Thinking, Reading, and Writing	3(3-0-6)
TU103	Life and Sustainability	3(3-0-6)
Sub-Total		20(18-6-36)

Semester II

GTS133	Environmental Studies	3(3-0-6)
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)
TU 105	Communication Skills in English	3(3-0-6)
TU 106	Creativity and Communication	3(3-0-6)
Sub-Total		19(17-6-34)

Second Year

Semester I

EES216	Circuit Analysis	3(3-0-6)
EES221	Computational Tools in EE	3(2-2-5)
EES298	EE Project Design I	1(0-3-0)
GTS202	English Language Structures	3(3-0-6)
MAS210	Mathematics III	3(3-0-6)
MES300	Engineering Drawing	3(2-3-4)
TU102	Social Life Skills	3(3-0-6)
Sub-Total		19(16-8-33)

Semester II

EES210	Basic Electrical Engineering Laboratory	1(0-3-0)
EES211	Electrical Measurement and Instrumentation	3(3-0-6)
EES212	Electromagnetics	3(3-0-6)
EES281	Signals and Systems	3(3-0-6)
EES331	Electronic Circuits I	3(3-0-6)
EES371	Digital Circuits	3(3-0-6)
GTS302	Technical Writing	2(2-1-3)
MES211	Thermofluids	3(3-0-6)
Sub-Total		21(20-4-39)

Third Year

Semester I

EES315	Probability and Random Processes	3(3-0-6)
EES332	Electronic Circuits II	3(3-0-6)
EES341	Electrical Machines	3(3-0-6)
EES351	Principles of Communications	3(3-0-6)
EES370	Digital Circuit Laboratory	1(0-3-0)
EES381	Feedback Control Systems	3(3-0-6)
EES382	Microprocessors and Embedded System	3(3-0-6)
EES398	EE Project Design II	1(0-3-0)
Sub-Total		20(18-6-36)

Course Credits (lecture-practice-self study hours)

Semester II

EES330	Electronic Circuits Laboratory	1(0-3-0)
EES380	Feedback Control Laboratory	1(0-3-0)
EESxxx	Technical Elective	3(x-x-x)
MES351	Engineering Dynamics	3(3-0-6)

Communication Engineering

EES451	Data Communications and Networks	3(3-0-6)
EES452	Digital Communication Systems	3(3-0-6)
EES455	Mobile Communications	3(3-0-6)
EES472	Digital Signal Processing	3(3-0-6)

Power Engineering

EES342	Electrical Power System	3(3-0-6)
EES441	Electrical System Design	3(3-0-6)
EES446	Energy Conservation and Management	3(3-0-6)
EES448	Electrical Safety	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

EES300	Electrical Engineering Training	1(0-40-0)
Sub-Total		1(0-40-0)

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

EESxxx	Technical Elective	3(x-x-x)
IES303	Engineering Management and Cost Analysis	3(3-0-6)
MES371	Material Science for Engineers	3(3-0-6)
TU101	Thailand, ASEAN, and the World	3(3-0-6)

Communication Engineering

EES450	Signal Processing and Communication Laboratory	1(0-3-0)
EES454	Communication Networks and Transmission Lines	3(3-0-6)
EES457	Broadband Communication	3(3-0-6)

Power Engineering

EES340	Electrical Machines Laboratory	1(0-3-0)
EES442	Power Electronics	3(3-0-6)
EES445	Renewable Energy	3(3-0-6)
Sub-Total		19(x-x-x)

Semester II

1) Senior Project Track

EES498	Electrical Engineering Project	5(0-15-0)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
Sub-Total		11(x-x-x)

2) Foreign Exchange Track

EES496	Special Studies in EE I	3(3-0-6)
EES497	Special Studies in EE III	2(2-0-4)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
Sub-Total		11(x-x-x)

3) Extended Training Track

EES499	Extended Electrical Engineering Training	6(0-40-0)
Sub-Total		6(0-40-0)