



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 tracks: academic exchange programs abroad, extended training programs with leading local companies, or senior projects with SIIT advisors. The last two tracks 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 | 150 Credits |

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 or TU109 | |
| 1.1.2 Humanities (1 course) | 3 Credits |
| TU102 or TU108 | |
| 1.1.3 Science and Mathematics (1 course) | 3 Credits |
| TU103 or TU107 | |
| 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 |
| Select one of the following two options: | |
| Option I : Communication Engineering | |
| 2.2.1.1 Basic Electrical Engineering | |
| EES210 EES211 EES212 EES216 | |
| EES221 EES281 EES298 EES315 | |
| EES330 EES331 EES332 EES341 | |
| EES370 EES371 EES380 EES381 | |
| EES382 EES398 | |
| 2.2.1.2 Communications Theory | |
| EES351 | |
| 2.2.1.3 Signal Processing | |
| EES472 | |
| 2.2.1.4 Communication Devices and Transmission Lines | |
| EES450 EES454 | |
| 2.2.1.5 Communication systems and Networks | |
| EES451 EES452 EES455 EES457 | |
| Option II : Power Engineering | |
| 2.2.1.1 Basic Electrical Engineering | |
| EES210 EES212 EES216 EES221 | |
| EES281 EES298 EES315 EES330 | |
| EES331 EES332 EES351 EES370 | |
| EES371 EES382 EES398 | |
| 2.2.1.2 Measurement, Instrument and Control System | |
| EES211 EES380 EES381 | |
| 2.2.1.3 Energy Conversion and Transportation | |
| EES340 EES341 EES445 EES446 | |
| 2.2.1.4 Electrical System, High Voltage Engineering, and Installation Standard | |
| EES342 EES441 EES442 EES448 | |
| 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 | |
| EES300 EES498 | |
| • Foreign Exchange Track | |
| EES300 EES496 EES497 | |
| • Extended Training Track | |
| EES499 | |
| 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 | 150 Credits |



EE Curriculum : 150 Credits

| 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 Engagement | 3(3-0-6) |
| TU104 | Critical Thinking, Reading, and Writing | 3(3-0-6) |
| TU103 | Life and Sustainability | 3(3-0-6) |
| or | | |
| TU107 | Digital Skill and Problem Solving | 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) |
| TU105 | Communication Skills in English | 3(3-0-6) |
| TU106 | 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) |
| or | | |
| TU108 | Self Development and Management | 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) |
| 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) |
| Option I : 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) |
| Option II : 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) |
| or | | |
| TU109 | Innovation and Entrepreneurial mindset | 3(3-0-6) |
| Option I : 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) |
| Option II : 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) |