# 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 provide fundamental knowledge in several major study areas so that students will be well prepared for work in the highly competitive and fast-moving electronics and communication engineering professions.

The compulsory courses are designed to provide students a broad understanding of the principles, illustrated by current applications, in electronics and communication engineering. The compulsory courses include four laboratory courses, providing hands-on learning of electric circuits, electronics, feedback control, and signal processing and communication.

By the end of the first semester of their fourth year, students will complete the study of most compulsory courses, with a strong emphasis in various communication systems. Through technical elective courses, students can further extend their knowledge in the communications area 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.

## Structure and Components

| | | |
|---|---|---|
| **1. General Basic Courses** | **30 Credits** | |
| 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 | |
| | | |
| **2. Core Courses** | **114 Credits** | |
| 2.1  Compulsory Courses | 108 Credits | |
| 2.2  Technical Elective Courses | 6 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  Humanities (1 course)  2  Credits
       TU110
    1.1.2  Social Sciences (2 courses)  5  Credits
       TU100    TU120
    1.1.3  Languages (3 courses)  9  Credits
       EL171    EL172    TU140
    1.1.4  Science and Mathematics (2 courses)  5  Credits
       ITS100    TU130
  1.2  Part II  9  Credits
     GTS132    GTS133    GTS202

**2. Core Courses**  **114 Credits**
  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

**3. Free Elective Courses**  **6 Credits**
  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

**Total Credit Requirement**  **150 Credits**

# EC Curriculum : 150 Credits

| Course | | Credits (lecture-practice-self study hours) |
|---|---|---|

## 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) |
| MES300 | Engineering Drawing | 3(2-3-4) |
| MES351 | Engineering Dynamics | 3(3-0-6) |
| | **Sub-Total** | **19(17-6-34)** |

### 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) |
| ECS332 | Principles of Communications | 3(3-0-6) |
| ECS370 | Digital Circuit Laboratory | 1(0-3-0) |
| ECS381 | Feedback Control Systems | 3(3-0-6) |
| ECS442 | Microwave Principles | 3(3-0-6) |
| MES211 | Thermofluids | 3(3-0-6) |
| | **Sub-Total** | **19(18-3-36)** |

| Course | | Credits (lecture-practice-self study hours) |
|---|---|---|

### Semester II
| | | |
|---|---|---|
| ECS320 | Electronic Circuits Laboratory | 1(0-3-0) |
| ECS380 | Feedback Control Laboratory | 1(0-3-0) |
| ECS382 | Microprocessors | 3(3-0-6) |
| ECS451 | Data Communications and Networks | 3(3-0-6) |
| ECS452 | Digital Communication Systems | 3(3-0-6) |
| ECS472 | Digital Signal Processing | 3(3-0-6) |
| ECSxxx | Technical Elective | 3(x-x-x) |
| TU110 | Integrated Humanities | 2(2-0-4) |
| | **Sub-Total** | **19(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) |
| | **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) |
| ECS450 | Signal Processing and Communication Laboratory | 1(0-3-0) |
| 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) |
| MES371 | Material Science for Engineers | 3(3-0-6) |
| TU120 | Integrated Social Sciences | 2(2-0-4) |
| | **Sub-Total** | **19(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) |
| | **Sub-Total** | **6(0-40-0)** |