# BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Electrical engineering is concerned with the generation, transmission, and utilization of electrical energy and with the transmitting and processing of information. Electrical engineers are involved in the analysis, design, and production of electric power, radio, radar, television, computing, telecommunication, control, and information systems. These engineers find solutions to the challenging technical problems that arise in our rapidly changing society. They impact virtually every aspect of daily life, as evidenced by examples such as wireless communications, audio and video equipment, power distribution, computerized traffic control, noise pollution monitoring and abatement, and medical instrumentation.

The electrical engineering curriculum puts emphasis on both theory and practical applications by providing a solid background in engineering science and mathematics, followed by a sequence of core courses in electrical engineering. Design skills are fostered in the professional elective courses in the senior year, along with the project experience instilled by Interprofessional Projects (IPROs).

The objectives of the ECE undergraduate electrical engineering program are to produce electrical engineering graduates who are prepared to:

- Enter their profession and make intellectual contributions to it
- Embark on a lifelong career of personal and professional growth
- Take advanced courses at the graduate level

## Required Courses

| Code | Title | Credit Hours |
|---|---|---|
| **Electrical Engineering Requirements** | | (32) |
| ECE 100 | Intro to the Profession I | 3 |
| ECE 211 | Circuit Analysis I | 3 |
| ECE 213 | Circuit Analysis II | 4 |
| ECE 218 | Digital Systems | 4 |
| ECE 242 | Digital Computers&Computing | 3 |
| ECE 307 | Electrodynamics | 4 |
| ECE 308 | Signals Systems | 3 |
| ECE 311 | Engineering Electronics | 4 |
| ECE 319 | Fndmntls of Power Engrn | 4 |
| **Professional ECE Electives** | | (17-20) |
| Select 17-20 credit hours [1] | | 17-20 |
| **Mathematics Requirements** | | (24) |
| MATH 151 | Calculus I | 5 |
| MATH 152 | Calculus II | 5 |
| MATH 251 | Multivariate & Vector Calculus | 4 |
| MATH 252 | Introduction to Diff Equations | 4 |
| MATH 333 | Matrix Alg & Complex Variables | 3 |
| MATH 374 | Probability/Statistics for ECE | 3 |
| **Physics Requirements** | | (11) |
| PHYS 123 | General Physics I: Mechanics | 4 |
| PHYS 221 | Gen Physics II: Elect&Magntism | 4 |
| PHYS 224 | Gen Physics III for Engnrs | 3 |
| **Chemistry Requirement** | | (3) |
| CHEM 122 | Principles of Chem I w/out Lab | 3 |
| **Engineering Science Requirement** | | (3) |
| MMAE 200 | Statics | 3 |
| or MMAE 320 | Thermodynamics | |
| **Computer Science Requirements** | | (4) |
| CS 115 | Object-Oriented Programming I | 2 |
| CS 116 | Object-Oriented Programming II | 2 |
| **Science Elective** | | (3) |
| Select one of the following: | | 3 |

| | | | |
|---|---|---|---|
| BIOL 105 | Introduction to Biology | 3 | |
| BIOL 114 | Introduction to Human Biology | 3 | |
| CHEM 126 | Principles Chemistry II | 3 | |
| MS 201 | Materials Science | 3 | |
| **Technical Elective** | | | (3) |
| Select three credit hours [2] | | | 3 |
| **Free Elective** | | | (3) |
| Select three credit hours | | | 3 |
| **Interprofessional Projects (IPRO)** | | | (6) |
| See Illinois Tech Core Curriculum, section E | | | 6 |
| **Humanities and Social Sciences Requirements** | | | (21) |
| See Illinois Tech Core Curriculum, sections B and C | | | 21 |
| Total Credit Hours | | | 130-133 |

1 Professional ECE electives may be chosen from any of the 400-level ECE courses identified with (P) in the course descriptions. Courses at the 500-level may be taken with the written consent of the instructor, faculty adviser, and the ECE department chair. At least two of the electives must contain laboratories. A maximum of three credit hours of Undergraduate Research (ECE 491) or Special Problems (ECE 497) may be used as professional ECE electives with adviser approval.

2 Adviser-approved course from engineering, science, mathematics, or computer science that is more advanced than the academic level of the student.

# Bachelor of Science in Electrical Engineering Curriculum

| | | | Year 1 |
|---|---|---|---|
| **Semester 1** | **Credit Hours** | **Semester 2** | **Credit Hours** |
| ECE 100 | 3 | MATH 152 | 5 |
| MATH 151 | 5 | PHYS 123 | 4 |
| CHEM 122 | 3 | CS 116 | 2 |
| CS 115 | 2 | Science Elective[1] | 3 |
| Humanities 200-level Course | 3 | Social Sciences Elective | 3 |
| | 16 | | 17 |

| | | | Year 2 |
|---|---|---|---|
| **Semester 1** | **Credit Hours** | **Semester 2** | **Credit Hours** |
| MATH 252 | 4 | MATH 251 | 4 |
| PHYS 221 | 4 | PHYS 224 | 3 |
| ECE 211 | 3 | ECE 213 | 4 |
| ECE 218 | 4 | ECE 242 | 3 |
| | | Social Sciences Elective (300+) | 3 |
| | 15 | | 17 |

| | | | Year 3 |
|---|---|---|---|
| **Semester 1** | **Credit Hours** | **Semester 2** | **Credit Hours** |
| MATH 333 | 3 | ECE 308 | 3 |
| ECE 307 | 4 | ECE 319 | 4 |
| ECE 311 | 4 | MATH 374 | 3 |
| IPRO Elective I | 3 | Social Sciences Elective (300+) | 3 |
| Humanities Elective (300+) | 3 | Free Elective | 3 |
| | 17 | | 16 |

| | | | Year 4 |
|---|---|---|---|
| **Semester 1** | **Credit Hours** | **Semester 2** | **Credit Hours** |
| IPRO Elective II | 3 | Professional ECE Elective[2] | 4 |
| Professional ECE Elective[2] | 4 | Professional ECE Elective[2] | 3-4 |
| Professional ECE Elective[2] | 3-4 | Professional ECE Elective[2] | 3-4 |
| Technical Elective[3] | 3 | MMAE 200 or 320 | 3 |
| Humanities Elective (300+) | 3 | Humanities or Social Sciences Elective | 3 |
| | 16-17 | | 16-18 |

Total Credit Hours: 130-133

1 Science elective must be BIOL 105, BIOL 114, CHEM 126, or MS 201.

2 Professional ECE electives may be chosen from any of the 400-level ECE courses identified with (P) in the course descriptions. Courses at the 500-level may be taken with the written consent of the instructor, faculty adviser, and the ECE department chair. At least two of the electives must contain laboratories. A maximum of three credit hours of Undergraduate Research (ECE 491) or Special Problems (ECE 497) may be used as professional ECE electives with adviser approval.

3 Adviser-approved course from engineering, science, mathematics, or computer science that is more advanced than the academic level of the student.

This program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).