ELECTRICAL ENGINEERING (B.S.)

In addition to the Undergraduate Program Goals for the College of Engineering, the specific objectives of the Bachelor of Science program in Electrical Engineering include the following:

1. Graduates will understand relevant engineering and scientific principles underlying electrical and computer technologies, and have the capability to apply theoretical, computational, and experimental methods to solve real engineering problems.

2. Graduates will have strong oral and written communication skills to interact with fellow engineers and non-technical personnel in a team environment.

3. Graduates will have computer skills for effective use in engineering. They will possess a working knowledge of modern programming languages, as well as operating systems and software packages for design, analysis, and simulation.

4. Graduates will be able to work hands-on in laboratories with state-of-the-art facilities and equipment to accomplish assigned tasks and projects.

5. Graduates will be aware of the societal responsibility of engineers and the essential nature of high ethical standards of professional behavior.

6. Graduates will possess effective engineering design capability and an awareness of cost, safety, sustainability, accessibility, and other associated constraints in engineering design.

Admission Requirements

For admission to the Bachelor of Science program, students must satisfy the admission criteria of the Division of Engineering, College of Engineering (http://bulletins.wayne.edu/undergraduate/college-engineering/bs).

Candidates for the Bachelor of Science degree must complete 125 credits of coursework, including the University General Education (http://bulletins.wayne.edu/undergraduate/general-information/general-education) requirements. All course work must be completed in accordance with the academic procedures of the University (http://bulletins.wayne.edu/undergraduate/general-information) and the College of Engineering (http://bulletins.wayne.edu/undergraduate/college-engineering/academic-regulations) governing undergraduate scholarship and degrees. The degree requirements shown in the curriculum below are in effect as of the publication date of this bulletin. However, students should consult an academic advisor for verification of current requirements.

In the freshman and sophomore years, the student acquires a foundation in the principles of science and mathematics required for the study of engineering. In addition, general education studies are provided to ensure a well-rounded education. Basic concepts of electrical circuits, electronics, computers and electromagnetic fields are studied after prerequisite mathematics and science backgrounds are mastered. In the senior year, a choice of electrical and computer engineering electives permits the student to specialize in one or more areas.

Electrical Engineering Curriculum

First Year

First Semester

BE 1200  Basic Engineering I: Design in Engineering  3

Second Semester

Any (WE) Wayne Experience  1

Credits  15

Second Year

First Semester

ECE 2610  Digital Logic Design  4

MAT 2030  Calculus III  4

PHY 2185  University Physics for Engineers II  4

Any (CIV) Civic Literacy  3

Credits  15

Second Semester

ECE 3330  Electrical Circuits II  4

ECE 3570  Electronics  4

Credits  14

Third Year

First Semester

ECE 3040  Numerical Methods for Engineers  3

ECE 3300  Introduction to Electrical Circuits  4

MAT 2150  Differential Equations and Matrix Algebra  4

Credits  14

Second Semester

ECE 2610  Digital Logic Design  4

MAT 2030  Calculus III  4

PHY 2185  University Physics for Engineers II  4

Any (CIV) Civic Literacy  3

Credits  15

Note at Bottom of Curriculum

(*) See Note at Bottom of Curriculum
### Computer Option

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>ECE 4050</td>
<td>Algorithms and Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4680</td>
<td>Computer Architecture</td>
<td>4</td>
</tr>
<tr>
<td>ECE 5650</td>
<td>Computer Networking and Network Programming</td>
<td>4</td>
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**Total Credits: 12**

### Electrical Option

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<tbody>
<tr>
<td>ECE 4470</td>
<td>Control Systems I</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4800</td>
<td>Electromagnetic Fields and Waves I</td>
<td>4</td>
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<tr>
<td>ECE Elective</td>
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**Total Credits: 12**

**TOTAL PROGRAM CREDITS: 125**

*Students are required to take either PHY 2171 along with PHY 2175 OR or take PHY 2181 along with PHY 2185. The Electrical Engineering department recommends taking PHY 2181. This makes the degree total 125 credits.*

**Course Material Fee**

A course material fee is charged for laboratory courses using expendable materials.

### Biomedical Electronics and Systems Option

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<th>Credits</th>
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<tr>
<td>ECE 5100</td>
<td>Quantitative Physiology</td>
<td>4</td>
</tr>
<tr>
<td>ECE 6180</td>
<td>Biomedical Instrumentation</td>
<td>4</td>
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Select one of the following:

<table>
<thead>
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<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECE 5690</td>
<td>Introduction to Digital Image Processing</td>
<td>4</td>
</tr>
<tr>
<td>ECE 5575</td>
<td>Introduction to Micro and Nano Electro Mechanical Systems (MEMS/NEMS)</td>
<td>4</td>
</tr>
<tr>
<td>ECE 5425</td>
<td>Robotic Systems I</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits: 12**

*Students are required to take either PHY 2171 along with PHY 2175 OR or take PHY 2181 along with PHY 2185. The Electrical Engineering department recommends taking PHY 2181. This makes the degree total 125 credits.*

Substitution of a course not on this list requires approval of the department chairperson or delegated faculty advisor.