**ELECTRICAL AND COMPUTER ENGINEERING (B.S.E.C.E.)**

The Electrical and Computer Engineering curriculum consists of two main course stems. In the electrical stem, students study signals and systems, electromagnetics, electronic circuit design and control systems design. In the computer stem, students study digital logic design, computer organization, embedded computer systems, hardware/software design and digital signal processing. With these two required stems, students gain a foundation in the major areas of electrical and computer engineering and are prepared for careers in a broad spectrum of industries. Elective courses allow a student to study a specialized field of interest, including areas like communication and networking, signal and image processing, optics and photonics, control and robotics, digital and embedded systems, wireless and microwave systems, and power and energy systems.

**Electrical and Computer Engineering Mission Statement**

The mission of the Electrical and Computer Engineering program is to educate students within a caring Christian environment, in the discipline of electrical and computer engineering. We want our graduates to be motivated by Christian ideals and to view their career as a lifelong commitment to serving others. We strive to provide our students with a strong technical foundation with an emphasis on professional, moral, ethical, and leadership development.

**BSECE Program Educational Objectives**

Within a few years after graduation, Baylor BSECE graduates will:

1. Be productive and valuable engineers.
2. Be successful in high-quality MS, PhD, JD, MBA, and MD programs.
3. Be mindful of the moral and ethical relationships that their engineering decisions have with society and the world.
4. Make positive contributions to their communities, churches, and society at large.

**BSECE Expected Graduate Outcomes**

In support of the program objectives, graduates of the program must demonstrate that they have:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

**B.S.E.C.E. Degree Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>ENG 2301</td>
<td>British Literature</td>
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<td>ENG 2304</td>
<td>American Literature</td>
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<tr>
<td>ENG 2306</td>
<td>World Literature</td>
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<td>ENG 2310</td>
<td>American Literary Cultures</td>
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<td>REL 1310</td>
<td>The Christian Scriptures</td>
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<td>REL 1350</td>
<td>The Christian Heritage</td>
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<td>REL 1360</td>
<td>The U.S. Constitution, Its Interpretation, and the American Political Experience</td>
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<td>CHE 1301</td>
<td>Basic Principles of Modern Chemistry I</td>
<td>3</td>
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<tr>
<td>MTH 1321</td>
<td>Calculus I</td>
<td>3</td>
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<tr>
<td>MTH 1322</td>
<td>Calculus II</td>
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<tr>
<td>MTH 2311</td>
<td>Linear Algebra</td>
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<tr>
<td>MTH 2321</td>
<td>Calculus III</td>
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<tr>
<td>MTH 3325</td>
<td>Ordinary Differential Equations</td>
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<td>STA 3381</td>
<td>Probability and Statistics</td>
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<td>PHY 1420</td>
<td>General Physics I</td>
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<td>PHY 1430</td>
<td>General Physics II</td>
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<td>MTH 3324</td>
<td>Numerical Methods</td>
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<tr>
<td>MTH 3326</td>
<td>Partial Differential Equations</td>
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<td>MTH 3370</td>
<td>Mathematical Methods of Operations Research</td>
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<td>MTH 4322</td>
<td>Numerical Analysis</td>
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<tr>
<td>MTH 4324</td>
<td>Systems of Ordinary Differential Equations</td>
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<td>MTH 4329</td>
<td>Theory of Functions of a Complex Variable</td>
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<td>STA 4374</td>
<td>Statistical Process Control</td>
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<tr>
<td>ME 4327</td>
<td>Numerical Methods for Engineers</td>
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**Other Requirements**
### Writing/Communication
- **ENG 1310** Writing and Academic Inquiry Seminars 3
- **PWR 3300** Technical Writing 3

### Engineering Economics
- **ECO 3308** Engineering Economic Analysis 3

### Ethics Elective
- **EGR 3305** Social and Ethical Issues in Engineering 3
- or **EGR 3315** Ethics of International Service

### Lifetime Fitness
Select three courses 3

### New Student Experience
- **EGR 1101** Engineering New Student Experience 1

### Electrical and Computer Engineering Major

#### Introduction to Engineering
- **EGR 1301** Introduction to Engineering 3
- **CSI 1430** Introduction to Computer Science I with Laboratory 4

#### Digital Design
- **ELC 2337** Digital Logic Design 3
- **ELC 2137** Digital Logic Design Laboratory 1
- **ELC 2330** Electrical Circuit Theory 3
- **ELC 2130** Electrical Circuit Laboratory 1
- **ELC 3114** Electronic Design Laboratory 1

#### Electrical Circuit Analysis
- **ELC 3314** Electronic Design 3
- **ELC 3335** Signals and Systems 3
- **ELC 3336** Microprocessor Systems 3
- **ELC 3337** Applied Electromagnetic Fields 3
- **ELC 3338** Computer Organization 3

#### Control and Systems
- **ELC 4332** Automatic Control Systems 3
- **ELC 4351** Digital Signal Processing 3
- **ELC 4438** Embedded Systems Design 4

#### Design
- **EGR 3380** Engineering Design I 3
- **EGR 4390** Engineering Design II 3

Select four courses from the following: 12
- **EGR 3V95** Internship Experience
- **ELC 4375** Elements of Nuclear Engineering
- **ELC 4311** Advanced Logic Design
- **ELC 4318** Avionics System Design
- **ELC 4320** Introduction to Optics
- **ELC 4321** Computational Photonics
- **ELC 4322** Integrated Photonics
- **ELC 4323** Solid-State Materials
- **ELC 4324** Semiconductor Devices
- **ELC 4325** Fundamentals of Lasers
- **ELC 4329** Introduction to Microfabrication
- **ELC 4330** Introduction to Robotics
- **ELC 4331** Electric Machines and Drives
- **ELC 4340** Power Systems
- **ELC 4345** Power Electronics
- **ELC 4350** Principles of Communication
- **ELC 4353** Image Formation and Processing
- **ELC 4357** Cardiovascular Engineering and Instrumentation

A grade of "C" or better in all of the Electrical and Computer Engineering hours counted towards major.

### Total Hours
128