### Electrical Engineering

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>Math 1371 Calculus I (placement into course or pre-req)</td>
<td>Math 1372 Calculus II (1371)</td>
</tr>
<tr>
<td>Phys 1301W Intro Physics I (Math 1371)</td>
<td>Phys 1302W Intro Physics II (1301, &amp;Math 1372)</td>
</tr>
<tr>
<td>CSE 1001 1st Yr Experience</td>
<td>EE1301 Intro to Comp Sys (Math 1371)</td>
</tr>
<tr>
<td>Liberal Education course or Writ 1301</td>
<td>EE 1001 Intro to EE and CompE (optional)</td>
</tr>
<tr>
<td>Liberal Education course</td>
<td>Liberal Education course</td>
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</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>Math 2371 Lin Alg/Diff Eq (1372)</td>
<td>Math 2374 Multivariable Calc (1372)</td>
</tr>
<tr>
<td>Chem 1065 Chem Princ Lab I (placement into course, 1015, &amp;1065)</td>
<td>Chem 1061 Chem Princ I (placement into course, 1015, &amp;1065)</td>
</tr>
<tr>
<td>EE 2001 Intro to Circ &amp; Elec (Math 2373, &amp;Phys 1302)</td>
<td>EE 2002 Intro Circ/Elec Lab (2001 or &amp;2001)</td>
</tr>
<tr>
<td>EE 2301 Intro Dig Sys Des (CSE, Math 1372)</td>
<td>EE 2301 Intro Dig Sys Des (CSE, Math 1372)</td>
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#### Junior Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tr>
<td>EE 3015 Signals &amp; Systems (UD, 2011)</td>
<td>EE 3025 Statistical Methods (UD, 3015)</td>
</tr>
<tr>
<td>EE 3101 Circ &amp; Elec Lab I (2002, 3115 or &amp;3115)</td>
<td>EE 3102 Circ &amp; Elec Lab II (3101)</td>
</tr>
<tr>
<td>EE 3115 Analog Electronics (UD, 3015 or &amp;3015)</td>
<td>EE 3601 Transmission Lines (2011, Phys 1302, Math 2373)</td>
</tr>
<tr>
<td>EE 3161 Semiconductor Dev (2011, &amp;Phys 2303 or &amp;Chem 1062/66)</td>
<td>Technical Elective (Breadth or Depth)</td>
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<tr>
<td>Liberal Education course</td>
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#### Senior Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>Technical Elective (Breadth or Depth)</td>
<td>EE 4951W Senior Design Proj (3015, 3102, 3115, 2361 preferred)</td>
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<tr>
<td>Technical Elective (Breadth or Depth)</td>
<td>Technical Elective (Breadth or Depth)</td>
</tr>
<tr>
<td>Additional Technical Elective</td>
<td>Additional Technical Elective</td>
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<tr>
<td>Liberal Education course</td>
<td>Additional Technical Elective</td>
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### About This Plan

- This plan is not a contract. Curriculum can change. The APAS is the official method for tracking completion of University degree requirements.
- Shaded courses are only offered in the indicated semester.
- Course pre-requisites and co-requisites (designated by &) are listed below the course number and title.
- Students can take either the CSE-only or University-wide versions of the math course (Math 1371/1271, 1372/1272, 2373/2243, 2374/2263).

### Applying to your Major

Students who have completed the required courses for admission to this major (indicated with double boxes on plan) and have a 3.2 UM-TC technical GPA at the end of the fall semester will be guaranteed admission. All other students who have completed the required courses will be considered for admission on a space-available basis. Admission following the spring semester is only based on space availability. The major application database is available at z.umn.edu/csemajorapp.

### Total Credits Needed for Degree: 124

### Department Contact Information

- Website: www.ece.umn.edu/undergraduate/
- Additional Information: z.umn.edu/ecematrix
- ECE Student Services: 3-166 Keller; Main Phone: 612-624-7777
- Director of Undergraduate Studies: Professor Jim Leger
- Departmental Advisor: Frances Wood; fkwood@umn.edu

### University Degree Requirements

All students must complete the following Writing & Liberal Education requirements, as noted on their APAS report. See link for full Core & Theme names: z.umn.edu/liberaleducation

### Writing Requirements:

**University Writing:**
Writ 1301/1401 or equivalent

**Writing Intensive (WI):**
Two: 1xxx or 2xxx level **
One: 3/4/5xxx level (in major)*
One: 3/4/5xxx level (any dept.)

Requirements with an (*) will be fulfilled by taking courses at UM-TC required for this major.

### Liberal Education

<table>
<thead>
<tr>
<th>CORES:</th>
<th>THEMES:</th>
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<tbody>
<tr>
<td>Bio</td>
<td>4 of 5:</td>
</tr>
<tr>
<td>Phy*</td>
<td>Civ</td>
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<tr>
<td>His</td>
<td>DSJ</td>
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<tr>
<td>SocS</td>
<td>Env</td>
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<tr>
<td>Ltr</td>
<td>GP</td>
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<tr>
<td>AH</td>
<td>TS</td>
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<tr>
<td>Mth*</td>
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</table>
Electrical Engineering

POSSIBLE POSITIONS

- **Application engineer**: Develop, create, and modify general computer applications software or specialized utility programs.
- **Computer hardware engineer**: Design and develop computer hardware, such as computer chips, circuit boards, modems, and printers. Also test hardware and supervise its installation.
- **Electronic engineer**: Employ knowledge of electronic theories and material properties to research, design, develop, and test electronic components and systems that are used in industrial, military, scientific, or commercial uses.
- **Firmware engineer**: Creates software used in electronic devices.
- **Software engineer**: Applies the principles and techniques of computer science, engineering, and mathematical analysis to the design, development, testing, and evaluation of the software and systems that enable computers to perform applications. Must possess strong programming skills, but are more concerned with developing algorithms and analyzing and solving programming problems than with writing code.
- **Test engineer**: Lay out, build, test, troubleshoot, repair, and modify developmental and production electronic components, parts, equipment, and systems.

**Some of these positions may require an advanced degree.**

INDUSTRIES

- Acoustics
- Antennas and propagation
- Automation
- Automotive
- Broadcasting
- Circuits and systems
- Consulting
- Electrical insulation
- Geoscience
- Healthcare
- HVAC systems
- Industrial/food products
- Lasers and electro-optics
- Magnetics
- Medical technologies
- Nuclear and plasma sciences
- Oceanic engineering
- Power electronics
- RF Communications
- Robotics
- Supercomputing
- Telecommunications
- Ultrasonics

EMPLOYERS

- 3M
- Boston Scientific
- Cummins
- Daikin Applied
- Emerson
- Entrust Datacard
- Honeywell
- Fluke Thermography
- Ford Motor Company
- Graco
- IBM
- Medtronic
- MISO
- Open Systems International
- Seagate
- Starkey Hearing Technologies
- Ulteig
- UTC Aerospace
- Wold Architects and Engineers
- Xcel Energy

**CSE Career Outcomes**

**Average Starting Salary:**

$64,406*

**Post-graduation Outcomes:**

Grad School: 27.5%
Employed: 71.5%
Other: 1%

**Post-graduation outcomes reflect the percentage of students who were employed full-time in their field or were enrolled in a graduate program.**

More Information

- Career Center: cse.umn.edu/career
- Salary Information: z.umn.edu/csesalary
- More Information on
- Undergraduate Majors: cse.umn.edu/majors

*Salary and Career Outcomes gathered from the 2016-2017 CSE Graduation Survey.