Computer Engineering Technical Electives 2024–2025

Five (5) Technical Electives are required in the Computer Engineering Program. Those five electives must be selected from the following list of courses. Of the five courses, not more than two (2) may be Electrical Engineering courses (identified with an asterisk *).

### FALL TERM 2024

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 3580 *  Foundations of Electromagnetics</td>
<td>PHYS 2152, MATH 3132, ECE 2240</td>
<td>4</td>
</tr>
<tr>
<td>ECE 3670 *  Electronics 3E</td>
<td>ECE 2160</td>
<td>4</td>
</tr>
<tr>
<td>ECE 3720 *  Electric Power and Machines</td>
<td>ECE 2262</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4150 *  Control Systems ‡</td>
<td>ECE 3780, ECE 2160</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4260 *  Communication Systems ‡</td>
<td>STAT 2220, ECE 3780</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4450 *  Applied Computational Intelligence</td>
<td>MATH 3132</td>
<td>4</td>
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<tr>
<td>ECE 4530 *  Parallel Processing</td>
<td>(COMP 2140 and ECE 3790) or (ECE 2240 and ECE 3730)</td>
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<tr>
<td>ECE 4560 *  Modern Computing Systems</td>
<td>ECE 3610</td>
<td>4</td>
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<tr>
<td>ECE 4610 *  Biomedical Instrumentation and Signal Processing</td>
<td>ECE 2160, ECE 3780</td>
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<tr>
<td>ECE 4860 (T02) Biomedical Signal Processing</td>
<td>ECE 3780</td>
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<tr>
<td>ECE 4860 (T05) Applied Probability and Stochastic Processes</td>
<td>STAT 2220</td>
<td>4</td>
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<tr>
<td>COMP 2150 *  Object Orientation</td>
<td>COMP 2140, COMP 2160</td>
<td>3</td>
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<tr>
<td>COMP 2160 Programming Practices</td>
<td>COMP 1020 (C+) and (pre-/co-requisite COMP 2140)</td>
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<tr>
<td>COMP 3010 *  Distributed Computing</td>
<td>ECE 3740, ECE 3790, STAT 2220</td>
<td>3</td>
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<tr>
<td>COMP 3020 *  Human-Computer Interaction 1</td>
<td>ECE 3740 or COMP 2150</td>
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</tr>
<tr>
<td>COMP 3190 Introduction to Artificial Intelligence</td>
<td>(ECE 3740 or COMP 2150), STAT 2220</td>
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</tr>
<tr>
<td>COMP 3380 Database Concepts and Usage</td>
<td>ECE 3740 or COMP 2150</td>
<td>3</td>
</tr>
<tr>
<td>COMP 3490 *  Computer Graphics 1</td>
<td>ECE 3740 or COMP 2150, MATH 1210, MATH 1510</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4350 Software Engineering 2</td>
<td>COMP 3010, COMP 3350, COMP 3380</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4710 Introduction to Data Mining</td>
<td>COMP 3380, STAT 2220</td>
<td>3</td>
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</table>

### WINTER TERM 2025

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Cr. Hrs.</th>
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</thead>
<tbody>
<tr>
<td>ECE 3540 *  Advanced Circuit Analysis and Design</td>
<td>ECE 2262, MATH 3132</td>
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<tr>
<td>ECE 3660 *  Physical Electronics</td>
<td>PHYS 2152, MATH 3132, ECE 3670</td>
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<tr>
<td>ECE 3630 *  Real-time Embedded Systems</td>
<td>ECE 3610, ECE 3740</td>
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<tr>
<td>ECE 4100 *  Microelectronic Fabrication</td>
<td>ECE 2160 (B+) or ECE 3670</td>
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<tr>
<td>ECE 4150 *  Control Systems ‡</td>
<td>ECE 3780, ECE 2160</td>
<td>4</td>
</tr>
<tr>
<td>ECE 4160 *  Control Engineering</td>
<td>ECE 4150</td>
<td>4</td>
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<tr>
<td>ECE 4180 Introduction to Robotics</td>
<td>ECE 4150, ECE 4240</td>
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<tr>
<td>ECE 4250 Digital Communications</td>
<td>ECE 4260, ECE 3780</td>
<td>4</td>
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<tr>
<td>ECE 4260 *  Communication Systems ‡</td>
<td>STAT 2220, ECE 3780</td>
<td>4</td>
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<tr>
<td>ECE 4440 *  Computer Vision</td>
<td>ECE 3780</td>
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<tr>
<td>ECE 4860 (T08) Sensors, Instrumentation, and the IoT</td>
<td>ECE 2160</td>
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<tr>
<td>COMP 2150 *  Object Orientation</td>
<td>COMP 2140, COMP 2160</td>
<td>3</td>
</tr>
<tr>
<td>COMP 2160 Programming Practices</td>
<td>COMP 1020 (C+) and (pre-/co-requisite COMP 2140)</td>
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<tr>
<td>COMP 3190 Introduction to Artificial Intelligence</td>
<td>(ECE 3740 or COMP 2150), STAT 2220</td>
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<tr>
<td>COMP 3380 Database Concepts and Usage</td>
<td>ECE 3740 or COMP 2150</td>
<td>3</td>
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<tr>
<td>COMP 3430 Operating Systems</td>
<td>COMP 2140, ECE 3610, ECE 3790, STAT 2220</td>
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<tr>
<td>COMP 4020 Human-Computer Interaction 2</td>
<td>COMP 3020, STAT 2220</td>
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<tr>
<td>COMP 4190 *  Artificial Intelligence</td>
<td>COMP 3190, STAT 2220</td>
<td>3</td>
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<tr>
<td>COMP 4350 Software Engineering 2</td>
<td>COMP 3010, COMP 3350, COMP 3380</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4360 Machine Learning</td>
<td>COMP 3190, STAT 2220, MATH 1210, MATH 1510</td>
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<tr>
<td>COMP 4380 Database Implementation</td>
<td>COMP 3010, COMP 3380, COMP 3430</td>
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<tr>
<td>COMP 4490 *  Computer Graphics 2</td>
<td>COMP 3490</td>
<td>3</td>
</tr>
<tr>
<td>COMP 4580 *  Computer Security</td>
<td>COMP 3010, COMP 3430</td>
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</tbody>
</table>

§ Computer Engineering students are required to take one of ECE 4150 Control Systems or ECE 4260 Communication Systems as a core program requirement. The other course may be taken as an elective.
Elective Courses Not Offered in 2024-2025

The following courses may be used as technical electives within the Computer Engineering program but are not being taught in the current academic year. Students who hold credit in these courses may continue to use them as electives within their program.

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
<th>Cr. Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 3750</td>
<td>Systems Engineering Principles 2</td>
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<tr>
<td>ECE 3770</td>
<td>Digital Systems Design 2</td>
<td>4</td>
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<tr>
<td>ECE 4390 *</td>
<td>Engineering Computation 4E</td>
<td>4</td>
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<tr>
<td>ECE 4420</td>
<td>Digital Control</td>
<td>4</td>
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<td>ECE 4520</td>
<td>Simulation and Modelling</td>
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<tr>
<td>ECE 4540</td>
<td>Wireless Networks</td>
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<td>ECE 4740</td>
<td>Digital System Implementation</td>
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<tr>
<td>ECE 4860</td>
<td>(T14) Optimization Techniques</td>
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<tr>
<td>COMP 3290</td>
<td>Introduction to Compiler Construction</td>
<td>3</td>
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<tr>
<td>COMP 4430</td>
<td>Operating Systems 2</td>
<td>3</td>
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</tbody>
</table>