Computer Engineering Advising Guide
Version 1.1

The degree requirements for Computer Engineering are detailed in the Academic Catalog which is available here: https://catalog.union.edu/. You can also find archived copies of the catalog at this location.

In the following pages, we have provided
• a check-sheet for the degree requirements
• a flowchart showing the prerequisite structure of the curriculum
• a course planning guide which shows when courses are offered
• a sample student schedule

Please see the catalog listings or the ECBE website for a list of upcoming courses offered.

Version History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Description</th>
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<tbody>
<tr>
<td>11/13/2019</td>
<td>1.0</td>
<td>Initial Version</td>
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<tr>
<td>02/10/2020</td>
<td>1.1</td>
<td>Changed STA103 -&gt; STA104 on Checksheet</td>
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</table>
### Computer Engineering -- 40 Course Credits Required

#### Core Math and Science

**Sequence Option One**

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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<tbody>
<tr>
<td>MTH 110 - Calculus 1: Differential Calculus</td>
<td></td>
</tr>
<tr>
<td>MTH 112 - Calculus 2: Integral Calculus</td>
<td></td>
</tr>
<tr>
<td>MTH 115 - Calculus 3: Differential Vector Calculus and Matrix Theory</td>
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</tr>
<tr>
<td>PHY 120 - Matter in Motion</td>
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</tr>
<tr>
<td>PHY 121 - Principles of Electromagnetics</td>
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**Sequence Option Two**

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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<tbody>
<tr>
<td>MTH 113 - Accelerated Single-Variable Calculus</td>
<td></td>
</tr>
<tr>
<td>MTH 115 - Calculus 3: Differential Vector Calculus and Matrix Theory</td>
<td></td>
</tr>
<tr>
<td>PHY 120 - Matter in Motion</td>
<td></td>
</tr>
<tr>
<td>PHY 121 - Principles of Electromagnetics</td>
<td></td>
</tr>
</tbody>
</table>

**Sequence Option Three**

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 113 - Accelerated Single-Variable Calculus</td>
<td></td>
</tr>
<tr>
<td>IMP 120 - Integrated Math/Physics (2 credits)</td>
<td></td>
</tr>
<tr>
<td>IMP 121 - Integrated Math/Physics (2 credits; includes MTH117 and satisfies Math Elective below)</td>
<td></td>
</tr>
</tbody>
</table>

*Other calculus sequences are possible depending upon a student's background.*

#### Additional Math and Science Requirements

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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</thead>
<tbody>
<tr>
<td>MTH 130 - Ordinary Differential Equations OR MTH 234 - Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MTH 197 - Discrete Mathematics for Computer Science OR MTH 199 - Introduction to Logic and Set Theory</td>
<td></td>
</tr>
<tr>
<td>One Math Elective from: STA104, MTH117, MTH127, MTH140, STA164, STA264, MTH221*, MTH235*, MTH238*, MTH340* (* requires MTH199 as a prerequisite)</td>
<td></td>
</tr>
<tr>
<td>One Science elective numbered 100 or higher (Recommended: CHM 101, PHY122, PHY123)</td>
<td></td>
</tr>
</tbody>
</table>

#### Engineering and Computer Science

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESC 100 - Exploring Engineering</td>
<td></td>
</tr>
<tr>
<td>CSC 10x - Introduction to Computer Science (choose a course from CSC103-107)</td>
<td></td>
</tr>
</tbody>
</table>

#### Computer Engineering Core

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 118 - Introduction to Computer and Logic Design</td>
<td></td>
</tr>
<tr>
<td>ECE 218 - Embedded Microcontroller Projects</td>
<td></td>
</tr>
<tr>
<td>ECE 225 - Electric Circuits</td>
<td></td>
</tr>
<tr>
<td>ECE 240 - Circuits and Systems [WAC]</td>
<td></td>
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<tr>
<td>ECE 241 - Discrete Systems [WAC]</td>
<td></td>
</tr>
<tr>
<td>ECE 248 - Introduction to Semiconductor Devices and Circuits</td>
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</tr>
<tr>
<td>ECE 318 - Digital Design [WAC]</td>
<td></td>
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<tr>
<td>ECE 336 - Computer Network Protocols OR ECE 337 - Data Communications and Networks</td>
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<tr>
<td>ECE 351 - Probability and Digital Communications</td>
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<tr>
<td>CSC 120 - Programming on Purpose</td>
<td></td>
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<tr>
<td>CSC 151 - Data Structures</td>
<td></td>
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<tr>
<td>CSC 250 - Algorithm Design and Analysis OR CSC 260 - Large-Scale Software Development</td>
<td></td>
</tr>
<tr>
<td>CSC 270 - Computer Organization</td>
<td></td>
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<tr>
<td>CSC 333 - Introduction to Parallel Computing OR CSC 335 - Operating Systems OR</td>
<td></td>
</tr>
<tr>
<td>CSC 375 - Compiler Design OR ECE366 - Control Systems</td>
<td></td>
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</tbody>
</table>
Computer Engineering Electives

3 additional CSC or ECE courses numbered 300 or higher. Students may also enroll in graduate engineering courses offered through Clarkson Graduate School, Capital Region Campus. Students should consult with their advisors.

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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</thead>
<tbody>
<tr>
<td>ECE 3xx OR CSC 3xx</td>
<td></td>
</tr>
<tr>
<td>ECE 3xx OR CSC 3xx</td>
<td></td>
</tr>
<tr>
<td>ECE 3xx OR CSC 3xx</td>
<td></td>
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</tbody>
</table>

Capstone Design

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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</thead>
<tbody>
<tr>
<td>ECE 497 - Electrical and Computer Engineering Capstone Design Project 1 (1/2 Credit)</td>
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<tr>
<td>ECE 498 - Electrical and Computer Engineering Capstone Design Project 2 (1/2 Credit) [WAC]</td>
<td></td>
</tr>
<tr>
<td>ECE 499 - Electrical and Computer Engineering Capstone Design Project 3</td>
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</tbody>
</table>

Common Curriculum Courses

A full description of Common Curriculum Requirements is available here: https://www.union.edu/files/general-education/201807/genedadvising170.pdf

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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</thead>
<tbody>
<tr>
<td>SCLB, QMR, SET - these requirements are fulfilled automatically through courses in the major</td>
<td></td>
</tr>
<tr>
<td>FYP - First Year Preceptorial</td>
<td></td>
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<tr>
<td>SRS - Sophomore Research Seminar</td>
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<tr>
<td>SOCS - Social Science (ANT/ECO/HST/PSC/PSY/SOC):</td>
<td></td>
</tr>
<tr>
<td>HUM - Humanities (ATH/AVA/CLS/EGL/MLL/PHL):</td>
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<tr>
<td>HUL - Humanities Literature:</td>
<td></td>
</tr>
<tr>
<td>LCC - Linguistic and Cultural Competency (†):</td>
<td></td>
</tr>
<tr>
<td>LCC - Linguistic and Cultural Competency (†):</td>
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</table>

† may be fulfilled by Study Abroad OR 2 LCC courses OR a sequence of 2 courses in the same language designated as LCC (note that the first course listed in any language (e.g., FRN 100, SPN 100, LAT 101, GRK 101 etc.) does not carry LCC credit)

Free Electives

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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5 Writing Across the Curriculum (WAC) Courses [Drawn from Courses Above]

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Term Taken</th>
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</thead>
<tbody>
<tr>
<td>ECE 240 - Circuits and Systems</td>
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<tr>
<td>ECE 241 - Discrete Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 318 - Digital Design</td>
<td></td>
</tr>
<tr>
<td>ECE 498 - Electrical and Computer Engineering Capstone Design Project 2</td>
<td></td>
</tr>
<tr>
<td>WAC from outside Engineering &amp; Computer Science -</td>
<td></td>
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</table>

Electives:
Electives should be chosen in consultation with the student’s advisor to meet the Common Curriculum requirements and enhance educational objectives. These elective courses can be customized to complete a double-major or one/or more minors.

Requirements for Honors:
In addition to meeting all of the general college requirements for honors, candidates for honors in computer engineering must present their senior project at the Steinmetz Symposium.
Prerequisites for Specific Required Courses in the Computer Engineering Curriculum

MTH 110 (FW)  MTH 112 (WS)  MTH 199 (FWS)  MTH 234 (W)  OR
  MTH 113 (FW)  MTH 115 (FWS)  MTH 130 (FWS)
  MTH 100,101,102 (F-W-S)  PHY 120 (FWS)  PHY 121 (FWS)
    MTH-197 (W)  IMP 120 (W)  IMP 121 (S)

ECE 318 (S)  ECE 225 (FW)  ECE 240 (WS)  ECE 351 (F)
  ECE 118 (F)  ECE 218 (W)  ECE 248 (S)
    ECE 337 (F)  OR

ESC 100 (F)  ECE 336 (F)
  ECE 337 (F)  OR
  CSC 10x (FWS)  ECE 241 (FS)
  ECE 225 (FW)  ECE 240 (WS)
    ECE 463

ECE 341

CSC 120 (FWS)  ECE 241 (FS)
  ECE 336 (F)
  CSC 151 (FW)
    ECE 347

CSC 260 (W)  ECE 366 (W)  OR
  OR
  CSC 250 (S)
  CSC 375
  OR
  CSC 333
  OR
  CSC 335

KEY:
Prerequisite
Can be a co-requisite
Choice of pre-requisites
Must have C-grade or better
Orange - indicates curriculum required course options
Blue - indicates some ECE elective course options
For electives (science, math, or technical), see on-line catalog for prerequisites
## Union College CpE Course Planning Guide

This guide assumes starting in MTH110

<table>
<thead>
<tr>
<th>Course History / Plan</th>
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<tbody>
<tr>
<td><strong>Freshman Year</strong></td>
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<tr>
<td><strong>Year:</strong></td>
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<tr>
<td><strong>Sophomore Year</strong></td>
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<td><strong>Year:</strong></td>
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<tr>
<td><strong>Junior Year</strong></td>
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<td><strong>Year:</strong></td>
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<tr>
<td><strong>Senior Year</strong></td>
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<td><strong>Year:</strong></td>
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</tbody>
</table>

**Indicates offered in this term ONLY**

[]: Take either CSC250 (S) or CSC260 (W); ECE336 or ECE337; and any one from ECE366 (W), CSC333/335/375. Check the course offerings schedule
### Union College CpE Sample Schedule

#### Your Schedule may differ substantially

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall Term</th>
<th>Winter Term</th>
<th>Spring Term</th>
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</thead>
<tbody>
<tr>
<td>Courses:</td>
<td>ESC 100+L</td>
<td>PHY 120+L</td>
<td>PHY 121+L</td>
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<tr>
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<td>MTH 110</td>
<td>MTH 112</td>
<td>MTH 115</td>
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<tr>
<td></td>
<td>FYP</td>
<td>SCI elective</td>
<td>CSC 103-108+L</td>
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<tr>
<td></td>
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<td>HUL</td>
<td></td>
</tr>
<tr>
<td>Sophomore Year</td>
<td>Fall Term</td>
<td>Winter Term</td>
<td>Spring Term</td>
</tr>
<tr>
<td>Courses:</td>
<td>ECE 118+L</td>
<td>CSC 151</td>
<td>HUM</td>
</tr>
<tr>
<td>10</td>
<td>CSC 120+L</td>
<td>ECE 225+L</td>
<td>ECE 240+L</td>
</tr>
<tr>
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<td>MTH 199</td>
<td>ECE 218+L</td>
<td>MTH 130</td>
</tr>
<tr>
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<td></td>
<td>SRS</td>
<td></td>
</tr>
<tr>
<td>Junior Year</td>
<td>Fall Term</td>
<td>Winter Term</td>
<td>Spring Term</td>
</tr>
<tr>
<td>Courses:</td>
<td>[TERM ABROAD]</td>
<td>[CSC 260]</td>
<td>ELECTIVE</td>
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<td>10.5</td>
<td>LCC</td>
<td>CSC 270</td>
<td>[CSC 335]</td>
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<td></td>
<td>LCC</td>
<td>SOC</td>
<td>ECE 248+L</td>
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<td>ELECTIVE</td>
<td>ECE/CSC elective</td>
<td>ECE497 (1/2)</td>
</tr>
<tr>
<td>Senior Year</td>
<td>Fall Term</td>
<td>Winter Term</td>
<td>Spring Term</td>
</tr>
<tr>
<td>Courses:</td>
<td>ECE 241+L</td>
<td>ECE 499</td>
<td>ECE 318+L</td>
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<tr>
<td>9.5</td>
<td>[ECE 336]</td>
<td>ECE/CSC elective</td>
<td>ECE/CSC elective</td>
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<td></td>
<td>ECE 351</td>
<td>Math elective</td>
<td>ELECTIVE</td>
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<tr>
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<td>ECE 498 (1/2)</td>
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**TERM ABROAD OPTION**

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