# Curriculum Worksheet for the Computer Systems Engineering Class of 2019

<table>
<thead>
<tr>
<th>First Year</th>
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<th>Second Year</th>
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<th>Third Year</th>
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<th>Fourth Year</th>
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</thead>
<tbody>
<tr>
<td><strong>ENGIN 112</strong></td>
<td><strong>CMPSCI 121</strong></td>
<td><strong>ECE 211</strong></td>
<td><strong>ECE 212</strong></td>
<td><strong>ECE 313</strong></td>
<td><strong>ECE 314</strong></td>
<td><strong>ECE 415</strong></td>
<td><strong>ECE 416</strong></td>
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<tr>
<td>Intro. to ECE</td>
<td>Intro. Problem Solving w/Comp (Java)</td>
<td>Circuit Analysis I</td>
<td>Circuit Analysis II</td>
<td>Signals &amp; Systems &amp; Random Processes</td>
<td>Intro. Prob. &amp; Random Processes</td>
<td>Senior Design Project I</td>
<td>Senior Design Project II</td>
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<tr>
<td><strong>PHYSICS 151</strong></td>
<td><strong>PHYSICS 152</strong></td>
<td><strong>ECE 221</strong></td>
<td><strong>ECE 232</strong></td>
<td><strong>ECE 323</strong></td>
<td><strong>ECE 374</strong></td>
<td><strong>CSE Elective</strong></td>
<td><strong>CSE Elective</strong></td>
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<td>[4 cr]</td>
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<tr>
<td><strong>MATH 131</strong></td>
<td><strong>MATH 132</strong></td>
<td><strong>ECE 242</strong></td>
<td><strong>MATH 235</strong></td>
<td><strong>ECE 353</strong></td>
<td><strong>ECE 354</strong></td>
<td><strong>CSE Elective</strong></td>
<td><strong>CSE Elective</strong></td>
</tr>
<tr>
<td>Calculus I</td>
<td>Calculus II</td>
<td>Data Structures &amp; Algorithms (w/Java)</td>
<td>Linear Algebra</td>
<td>Computer Systems Lab I</td>
<td>Computer Systems Lab II</td>
<td>[3 or 4 cr]</td>
<td>[3 or 4 cr]</td>
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<td>[4 cr]</td>
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<tr>
<td><strong>Social World Elective</strong></td>
<td><strong>Biological Sciences Elective</strong></td>
<td><strong>MATH 331</strong></td>
<td><strong>ECE 250</strong></td>
<td><strong>ECE 373</strong></td>
<td><strong>ECE 303</strong></td>
<td><strong>Social World Elective</strong></td>
<td><strong>Social World Elective</strong></td>
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<td>[4 cr]</td>
<td>[3 or 4 cr]</td>
<td>Differential Equations</td>
<td>Intro. to Computation</td>
<td>Software Intensive Engineering</td>
<td>Junior Seminar</td>
<td>[3 cr]</td>
<td>[4 cr]</td>
</tr>
<tr>
<td>[Note 2]</td>
<td>[Note 4]</td>
<td>[3 cr]</td>
<td>[4 cr]</td>
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<tr>
<td><strong>ENGIN 191</strong></td>
<td><strong>ENGLWRIT 112</strong></td>
<td><strong>Science Elective</strong></td>
<td><strong>ENGIN 351</strong></td>
<td><strong>5-yr B.S. / M.S. Graduate Course</strong></td>
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<td>Freshman Seminar</td>
<td>College Writing</td>
<td>[3 or 4 cr]</td>
<td>Writing in Engineering</td>
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<td>[1 cr]</td>
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<td>[Notes 5 &amp; 6]</td>
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<td>[Note 3]</td>
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*The curriculum notes can be found on the reverse side of this worksheet.*

**University of Massachusetts Amherst** • **Department of Electrical and Computer Engineering**

[http://ece.umass.edu/](http://ece.umass.edu/)

Updated June 2015
The abbreviations “ECE” and “E&C-ENG” are equivalent. They are both abbreviations of “Electrical and Computer Engineering”. “ECE” tends to be used in departmental publications and “E&C-ENG” is used on SPIRE and on official schedules and transcripts.

It is important that the Undergraduate Catalog posted on SPIRE (https://spire.umass.edu) be consulted for course descriptions and course requisites. It is the student’s responsibility to drop any course for which she or he does not have all of the published requisites.

Note 1 • ENGIN 112, Intro. to ECE

In the Fall semester, choose one of the following:

- ENGIN 110: Intro. to Chemical Engineering I
- ENGIN 111: Intro. to Civil & Environmental Engineering I
- ENGIN 112: Intro. to Electrical & Computer Engineering I
- ENGIN 113: Intro. to Mechanical & Industrial Engineering I

A grade of C or better in one of the ENGIN 11x courses is required for all engineering majors. ENGIN 112 is strongly recommended for CSE and EE majors.

Note 2 • Social World Electives / Diversity Requirements

Choose four Social World Electives (four credits each) consisting of:

1. One Literature or Art elective: AL or AT
2. One Historical Studies elective: HS
3. One Social and Behavioral elective: SB
4. One more elective: AL, AT, SB, I or SI

Also, choose two courses to meet the Social & Cultural Diversity requirement: one course focusing on United States diversity (U, ALU, ATU, HSU, IU, SBG, or SIU) and one course focusing on Global diversity (G, ALG, ATG, HSG, IG, SBG, or SIG). Most students satisfy the Diversity requirement with two of their four Social World electives. In other words, with careful planning, four courses may be used to satisfy all six graduation requirements.

Note 3 • Freshman Seminar

All engineering students required to enroll in a 1-credit Freshman Seminar in their first semester.

Note 4 • Biological Sciences Elective

The Biological Sciences Elective can be fulfilled with any course that satisfies the University’s Biological Sciences (BS) General Education requirement.

Note 5 • Science Elective

The Science Elective is required for all CSE and EE majors. There are currently five approved courses, as listed below.

- BIO 110: Intro. Biology for Science Majors (2nd sem) 4 cr
- BIO 151: Intro. Biology I (both sem) 4 cr
- CHEM 111: Gen. Chemistry for Science Majors (both sem) 4 cr
- CHEM 121H: Hon. Gen. Chem. for Science Maj. (1st sem) 4 cr
- PHYSICS 287: Physics III – Waves & Thermo. (1st sem) 3 cr

Note 6 • Alternative Electives

To propose a different course to satisfy either the Science Elective or CSE Elective, fill out the Alternative Elective Request Form, and take it to the Undergraduate Programs Office. The form is online at: http://ece.umass.edu/undergraduate-students/forms-documents.

Note 7 • CSE Electives

Choose four CSE Electives. The electives must include at least two 500-level courses (or above) that may not be used to satisfy the requirements for any other major. Each is 3 credits unless otherwise indicated.

- ECE 324: Electronics II (2nd sem)
- ECE 333: Fields and Waves I (2nd sem) 4 cr
- ECE 344: Semiconductor Devices and Materials (1st sem) 4 cr
- ECE 544: Trustworthy Computing (1st sem)
- ECE 558: Intro. to VLSI Design (1st sem) 4 cr
- ECE 559: VLSI Design Project (2nd sem)
- ECE 563: Intro. to Comm. & Signal Processing (1st sem)
- ECE 564: Communication Systems (2nd sem) 4 cr
- ECE 565: Digital Signal Processing (2nd sem) 4 cr
- ECE 568: Introduction to Computer Architecture (1st sem)
- ECE 570: System Software Design (2nd sem)
- ECE 571: Microelectronic Fabrication (2nd sem) 4 cr
- ECE 572: Optoelectronics (1st sem)
- ECE 575: Intro. to Analog IC Design (1st sem)
- ECE 580: Feedback Control Systems (1st sem) 4 cr
- ECE 584: Microwave Engineering I (1st sem) 4 cr
- ECE 585: Microwave Engineering II (2nd sem)

All ECE 597 Special Topics courses and all 600-level ECE courses (except ECE 696) are allowed as well. Note that instructor permission is required to enroll in any 600-level course.

The following courses are approved as CSE electives, but enrollment in them is not guaranteed. Priority is given to CMPSCI students. To request an override into one of these courses, follow the posted instructions at https://www.cs.umass.edu/ugrad-education/overrides. This page includes a link to the appropriate online Override Request Form.

- CMPSCI 311: Introduction to Algorithms (both sem) 4 cr
- CMPSCI 377: Operating Systems (1st sem) 4 cr
- CMPSCI 383: Artificial Intelligence (1st sem)
- CMPSCI 403: Introduction to Robotics (1st sem)
- CMPSCI 410: Compiler Techniques (1st sem)
- CMPSCI 445: Information Systems (2nd sem)
- CMPSCI 446: Search Engines (2nd sem)
- CMPSCI 474: Image Synthesis (2nd sem)
- CMPSCI 501: Formal Language Theory (2nd sem)
- CMPSCI 513: Logic in Computer Science (2nd sem)
- CMPSCI 520: Software Engin: Synthesis and Development (2nd sem)
- CMPSCI 521: Software Engin: Analysis and Evaluation (1st sem)
- CMPSCI 529: Software Engin: Project Management (both sem)
- CMPSCI 585: Introduction to Natural Language Processing (1st sem)

Consult SPIRE to check course offerings and availability.

Note 8 • Five-Year B.S./ M.S. in ECE

The Department of Electrical and Computer Engineering offers a five-year program through which students can obtain a Bachelor of Science degree in Electrical or Computer Systems Engineering as well as a Master of Science degree in Electrical and Computer Engineering within a five-year time frame. During the senior year, two graduate-level courses are taken that are later transferred into the M.S. program. More information is posted at http://ece.umass.edu/ece/five-year-program.

Resources can be found at http://ece.umass.edu/undergraduate-students/academics-advising/advising-resources. Updated June 2015