

B.S. Computer Engineering
Sample Curriculum¹ - Class of 2014

| <i>Fall</i> | | 1st YEAR | | | | <i>Spring</i> | |
|-------------|------------------------------|----------------------------|----------|-----------------------------|---|---------------|-----------|
| ECE 100 | ELE & CEN Eng Seminar | 1 | ECE 177 | Intro to Prog for Engineers | 4 | | |
| ECE 101 | Intro to ELE & CEN Eng | 3 | MAT 127 | Calculus II | 4 | | |
| MAT 126 | Calculus I | 4 | PHY 122 | Physics for Engineers II | 4 | | |
| PHY 121 | Physics for Engineers I | 4 | ENG 101 | College Composition | 3 | | |
| CMJ 103 | Fund of Public Communication | 3 | Elective | HV & SC (1) | 3 | | |
| | | 15 | | | | | 18 |

| | | 2nd YEAR | | | | | |
|-----------------------|------------------------------|----------------------------|----------------------|----------------------------|---|--|-----------|
| ECE 210 | Electrical Networks I | 3 | ECE 211 | Electrical Networks II | 3 | | |
| ECE 275 | Sequential Logic Systems | 3 | ECE 214 | Electrical Networks Lab | 2 | | |
| MAT 228 | Calculus III | 4 | ECP 214 | Engineering Writing I | 1 | | |
| COS 221 | Intro to Computer Science II | 3 | ECE 271 | Micro Arch & Applications | 3 | | |
| Elective ² | Basic Science | 4 | MAT 258 | Diff Eqn. & Linear Algebra | 4 | | |
| | | | ECE 316 ³ | Random Variable Analysis | 3 | | |
| | | 17 | | | | | 16 |

| | | 3rd YEAR | | | | | |
|------------------------|-----------------------------|----------------------------|------------------------|--------------------------------------|---|--|-----------|
| ECE 342 | Electronics I | 4 | ECE 331 ⁴ | Operating System Engineering | 3 | | |
| ECP 342 | Engineering Writing II | 1 | ECE 401 | Design Project | 1 | | |
| ECE 471 ⁵ / | Embedded Systems <i>or</i> | 3 | ECE 477 ⁵ / | Hardware Applications in C <i>or</i> | 3 | | |
| Elective | Computer Focus (1) | | Elective | Computer Focus (1) | | | |
| ECE 473 | Computer Architecture & Org | 4 | ECE 486 | Digital Signal Processing | 4 | | |
| Elective | Computer Focus (2) | 3 | Elective | Computer Focus (3) | 3 | | |
| | | | Elective | HV & SC (2) | 3 | | |
| | | 15 | | | | | 17 |

| | | 4th YEAR | | | | | |
|----------------------|----------------------------|----------------------------|----------|--------------------------------|---|--|-----------|
| ECE 402 | Design Project II | 4 | ECE 403 | Design Project III | 2 | | |
| MAT 481 ⁶ | Discrete Mathematics | 3 | ECP 403 | Engineering Writing III | 1 | | |
| Elective | ECE Technical Elective (1) | 3 | Elective | ECE Technical Elective (2) | 3 | | |
| Elective | HV & SC (3) | 3 | Elective | Generic Technical Elective (1) | 3 | | |
| Elective | HV & SC (4) | 3 | Elective | Generic Technical Elective (2) | 3 | | |
| | | | Elective | HV & SC (5) | 3 | | |
| | | 16 | | | | | 15 |

MINIMUM CREDIT HOURS TO GRADUATE: 129²

1. This is only a sample curriculum. Adjustments, such as interchanging HV & SC and technical electives, and switching ECE 471, ECE 477, ECE 473, and ECE 351 between junior and senior years, can be made to suit individual preferences. Check with your academic advisor for assistance. Be sure all degree requirements listed on the check-off sheet are met.
2. **BIO 222/223 or ERS 102** can be used to satisfy the Basic Science and HV&SC Elective under the Population and Environment categories. If either of them is taken, you need to take one less HV&SC course. However, you still need 129 credit hours to graduate.
3. One of the following three courses is required: ECE 316, CHB 350 and MAT 332. If CHB 350 or MAT 332 has been taken, ECE 316 can be taken as ECE technical elective. Otherwise, ECE 316 cannot be counted as technical elective.
4. ECE 331 can be replaced by COS 431 Operating Systems.
5. Either ECE 471 (Fall) or ECE 477 (Spring) is required. One can take both courses and use the other as computer focus ECE elective.
6. MAT 481 can be replaced with COS 250 Discrete Structures.

Check List
Graduation Requirements
COMPUTER ENGINEERING – Class of 2014

STUDENT _____

ADVISOR _____

1. Total hours (at least 129) _____
2. Passing grade in all required courses _____

3. Overall GPA 2.0 _____
4. Department GPA 2.0 _____
5. Computer courses 2.0 _____

Required Course Grades

- | | | | |
|---------------|---------------|---------------|--------------------------|
| PHY 121 _____ | MAT 126 _____ | ECE 100 _____ | ECE 316 _____ |
| PHY 122 _____ | MAT 127 _____ | ECE 101 _____ | ECE 331 _____ |
| | MAT 228 _____ | ECE 177 _____ | ECE 342 _____ |
| COS 221 _____ | MAT 258 _____ | ECE 210 _____ | ECE 401 _____ |
| | MAT 481 _____ | ECE 211 _____ | ECE 402 _____ |
| | | ECE 214 _____ | ECE 403 _____ |
| ECP 214 _____ | ENG 101 _____ | ECE 271 _____ | ECE 473 _____ |
| ECP 342 _____ | | ECE 275 _____ | ECE 486 _____ |
| ECP 403 _____ | | | ECE 471 or ECE 477 _____ |

HV&SC + Ethics Course Requirements (minimum of 18 hrs in the first 5 of the 6 areas)

Each of the 6 areas below must be represented. A course may represent multiple areas.

| Course | Hours | Grade | 18 Credit Hours Required | | | | | Ethics |
|---------|-------|-------|--------------------------|-----|------|-----|-----|--------|
| | | | West | Soc | Cult | Pop | Art | |
| CMJ 103 | 3 | | | X | | | | |
| | | | | | | | | |
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| | | | | | | | | |

West - Western cultural tradition; Soc - Social context and institutions; Cult - Cultural diversity and international perspectives; Pop - Population and the environment; Art - Artistic and creative expression.

Grade

Basic Science Course/Grade (4 hrs) _____

Technical Electives/Grades (at least 21 hrs)

- | | | | | | |
|-----------------------------|-------|--|---------------------------------|-------|--|
| Computer Focus #1: _____ | Grade | | Generic Tech Elective #1: _____ | Grade | |
| Computer Focus #2: _____ | | | Generic Tech Elective #2: _____ | | |
| Computer Focus #3: _____ | | | | | |
| ECE Tech Elective #1: _____ | | | | | |
| ECE Tech Elective #2: _____ | | | | | |

Advisor Reviews

| Date | Initials | Comments |
|-------|----------|----------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Graduation Requirements - Computer Engineering

- To obtain a BS in Computer Engineering, a student must:
 - meet all University academic requirements;
 - meet all Computer Engineering curriculum requirements;
 - have a GPA of 2.0 or better in all ECE courses; and
 - have a GPA of 2.0 or better in all computer courses.
- Any exceptions to the program specifics listed above require approval of the ECE faculty.
- Repeating any ECE course for which a grade of F, L, or WF has been recorded requires a grade of C- or better in prerequisites for the course.
- Dismissal from the program will be recommended if any required course in the program is taken twice without achieving a passing grade. This includes courses where a grade of AU, L, or WF is received.

Information about Elective Courses

Technical Electives: The curriculum requires seven technical elective courses used to broaden a student's knowledge. Of these seven elective courses, at least three electives must be Computer focus courses chosen from the list below; two must be 300-level or higher ECE courses excluding ECE 394, and two must be Generic Technical Elective courses described below.

- Courses that satisfy the Computer Focus requirement are:

| | | | |
|---------|------------------------------------|---------|---|
| ECE 417 | Introduction to Robotics | ECE 471 | Microprocessor Applications Engineering |
| ECE 435 | Network Engineering | ECE 478 | Industrial Computer Control |
| ECE 477 | Hardware Applications Using C | ECE 498 | Select topics (Computer focus) |
| COS 3xx | Computer Science 300 level courses | COS 4xx | Computer Science 400 level courses |

- Generic technical electives include 300-level or higher ECE courses including ECE 394, or with approval of the student's advisor, selected from various advanced Math, Physics, Biology, Chemistry, Engineering, or Computer Science courses. For a minor in Business Administration or 5-year BS/MBA program, up to two technical electives can be satisfied by taking BUA 325 or BUA 350 with the provision that upon graduation, the student also satisfied all requirements for the Business minor or BS/MBA program. The following 100- and 200-level courses have been approved to satisfy the Generic Technical Elective requirement. Other courses may be permitted but require written approval from the ECE Department Chair.

| | | | |
|---------|---|---------|-----------------------------------|
| CHB 200 | Fundamentals of Process Engineering | MEE 230 | Thermodynamics I |
| CIE 231 | Fundamentals of Environmental Engineering | MEE 252 | Statics and Strength of Materials |
| MEE 150 | Applied Mechanics: Statics | MEE 270 | Applied Mechanics: Dynamics |
| GEE 298 | Intro to Nanoscale Science and Technology | | |

Areas of Concentration: Student may choose to concentrate electives in various sub-disciplines of Computer Engineering. The recommended electives for various specialties are listed below.

Embedded Control

| | |
|---------|---------------------------------|
| ECE 478 | Industrial Computer Control |
| ECE 477 | Hardware Applications Using C |
| ECE 471 | Microprocessor App. Engineering |
| ECE 414 | Feedback Control Systems |

High-performance Computing

| | |
|---------|-------------------------------|
| ECE 331 | Operating System Engineering |
| ECE 477 | Hardware Applications Using C |
| ECE 435 | Network Engineering |

Robotics

| | |
|---------|---------------------------------|
| ECE 417 | Introduction to Robotics |
| ECE 477 | Hardware Applications Using C |
| ECE 471 | Microprocessor App. Engineering |
| ECE 487 | Digital Image Processing |

Basic Science Elective: Courses satisfying the Basic Science Elective include:

| | | | |
|-------------|------------------------------------|-------------|------------------------------------|
| AST 215/110 | General Astronomy I | BIO 222/223 | Biology |
| AST 216/110 | General Astronomy II | ERS 101 | Introduction to Geology |
| CHY 121/123 | Introduction to Chemistry | ERS 102 | Environmental Geology of Maine |
| CHY 122/124 | Molecular Basis of Chemical Change | PHY 236/223 | Quantum Physics/Special Relativity |

Human Values and Social Context and Ethics: In addition to CMJ 103, the curriculum requires five courses to complete the General Education Requirements in Ethics and Human Values and Social Context (HV&SC). In addition to the Ethics requirement, the five areas under HV&SC are: Western Cultural Tradition, Social Contexts and Institutions, Cultural Diversity and International Perspective, Population and the Environment, and Artistic and Creative Expression. Note that CMJ 103 satisfies the Social Contexts and Institutions requirement. A list of HV&SC courses with the categories that they satisfy is available on the [Office of Student Records](http://studentrecords.umaine.edu/academics/genedreq.htm) web page (<http://studentrecords.umaine.edu/academics/genedreq.htm>). The structure of the ECE curriculum guarantees that all other General Education Requirements are met. You may elect to take ERS 102 or BIO 222/223 to satisfy your Basic Science requirement and the “Population and the Environment” area of the 18 credit hour HV&SC requirement.

Additional Information

Check the web page of [Frequently Asked Questions \(FAQ\)](http://www.eece.maine.edu/programs/undergrad/ece_faq) for additional information about the ECE program: http://www.eece.maine.edu/programs/undergrad/ece_faq. Contact your academic advisor for assistance.