B.S. Computer Engineering

Sample Curriculum with Double Co-op [1] — Class of 2013

1st YEAR

Fall			*Spring*		
ECE 101	Intro to ELE & CEN Eng	4	ECE 177	Intro to Prog for Engineers	4
MAT 126	Calculus I	4	MAT 127	Calculus II	4
CHY 121	Intro to Chemistry	3	PHY 121	Physics for Engineers I	4
CHY 123	Intro to Chemistry Lab	1	CMJ 103	Fund of Public Communication	3
ENG 101	College Composition	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	3
MAT 228	Calculus III	4	ECP 214	Engineering Writing I	1
PHY 122	Physics for Engineers II	4	ECE 271	Micro Arch & Applications	3
COS 221	Intro to Computer Science II	3	MAT 258	Diff Eqn. & Linear Algebra	4
			Elective [2]	Basic Science	4
		17			**18**

3rd YEAR

ECE 300	Seminar	1	ECE 401	Design Project I	1
ECE 314	Signals and Systems	3	ECP 401	Engineering Writing III	1
ECE 342	Electronics I	4	ECE 394	Spring Semester Co-op	3
ECP 342	Engineering Writing II	1			
ECE 471 [3] / Elective [4]	Microproc Appl Engineering ***or*** Computer Focus (1)	3			
ECE 316 [5] / Elective [4]	Random Signal Analysis ***or*** Computer Focus (2)	3			
		15			**5**

4th YEAR

ECE 402	Design Project II	4	ECE 343	Electronics II	4
ECE 473	Computer Architecture & Org	3	ECE 403	Design Project III	2
COS 431	Operating Systems	3	Elective	HV & SC (2)	3
MAT 481 [6]	Discrete Mathematics	3	ECE 477 [3] / Elective [4]	Hardware Applications in C ***or*** Computer Focus (1)	3
Elective [4]	Computer Focus (3)	3	CHB 350 [5] / Elective [4]	Statistical Proc & Analysis ***or*** Computer Focus (2)	3
		16			**15**

5th YEAR

ECE 394	Fall Semester Co-op	3	Elective	HV & SC (3)	3
			Elective	HV & SC (4)	3
		3			**6**

MINIMUM CREDIT HOURS TO GRADUATE: 128 [2]

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 COS 431 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 these courses is take, the minimum credit hours to graduate is 128. If an alternative Basic Science course is taken, the minimum credit hours for graduation would be **131**.
3. Either ECE 471 (Fall) or ECE 477 (Spring) is required. One can take both courses and use the other as computer engineering focus ECE elective.

4. At least five technical electives are required. Among the five technical electives, three must be ***computer focus*** excluding ECE 394.
5. 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 technical elective (non-computer focused). Otherwise, ECE 316 cannot be counted as technical elective.
6. MAT 481 can be replaced with COS 250 Discrete Structures.

Information about Elective Courses

Technical Electives: The curriculum requires **five** technical elective courses used to broaden a student's knowledge base or to specialize in areas like Supercomputing, Neural Network, Microelectronics, Sensors, Power and Industrial Control, Computer Hardware, or Communications and Signal Processing. Of these five elective courses, at least **three** must be computer focus.

1. Computer focus technical electives include 300 or 400 level computer science courses and the following ECE courses. ECE 394 **cannot** meet the computer focus requirement.

ECE 331	Intro. to Unix Systems Administration	ECE 417	Introduction to Robotics
ECE 435	Network Engineering	ECE 471	Microprocessor Applications Engineering
ECE 477	Hardware Applications Using C	ECE 478	Industrial Computer Control
ECE 486	Digital Signal Processing	ECE 498	Select topics (CEN focus)

2. Other 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, Computer Science, or Business courses. 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 200-level courses can be used as non-computer focus technical electives. 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
GE 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		**Robotics**	
ECE 478	Industrial Computer Control	ECE 417	Introduction to Robotics
ECE 477	Hardware Applications Using C	ECE 477	Hardware Applications Using C
ECE 471	Microprocessor App. Engineering	ECE 471	Microprocessor App. Engineering
ECE 414	Feedback Control Systems	ECE 535	Computer Vision
High-performance Computing		**Networking**	
ECE 331	Intro. to Unix Systems Admin.	ECE 435	Network Engineering
ECE 574	Cluster Computing	ECE 585	Wireless Communication

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 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 part of the 18 credit hour HV&SC requirement. If neither ERS 102 nor BIO 222/223 is taken, three additional credit hours of HV&SC are required for graduation (i.e., a minimum of 131 credit hours for graduation).

Basic Science Elective: In addition to CHY 121/123, PHY 121 and PHY 121, the Curriculum requires at least one additional physical or biological science course, with a lab, to broaden a student's knowledge base in science. 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 122/124	Molecular Basis of Chemical Change	ERS 102	Environmental Geology of Maine
PHY 236/223	Modern Physics and Special Relativity		

Program Specific Requirements

1) 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.
2) 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, W, or WF is received.
3) To obtain a BS in Computer Engineering, a student must:
    a. meet all University academic requirements;
    b. meet all Computer Engineering curriculum requirements;
    c. have a GPA of 2.0 or better in all ECE courses; and
    d. have a GPA of 2.0 or better in all COS courses.
4) Any exceptions to the program specifics listed above require approval of the ECE faculty.

Additional Information

Check the web page of Frequently Asked Questions (FAQ) for additional information about the ECE program: http://www.eece.maine.edu/programs/undergrad/ece_faq

Check List
Graduation Requirements
COMPUTER ENGINEERING – Class of 2013

STUDENT _____ **ADVISOR** _____

1. Total hours (at least 128[a]) _____
2. Passing grade in all required courses _____
3. Overall GPA 2.0 _____
4. Department GPA 2.0 _____
5. COS courses 2.0 _____

Required Course Grades

CHY 121 _____	MAT 126 _____	ECE 101 _____	ECE 300 _____
CHY 123 _____	MAT 127 _____	ECE 177 _____	ECE 314 _____
COS 221 _____	MAT 228 _____	ECE 271 _____	ECE 342 _____
COS 431 _____	MAT 258 _____	ECE 210 _____	ECE 343 _____
[b] ECE 316 _____	[c] MAT 481 _____	ECE 211 _____	ECE 401 _____
		ECE 214 _____	ECE 402 _____
ECP 214 _____	ENG 101_____	ECE 275 _____	ECE 403 _____
ECP 342 _____	PHY 121 _____		ECE 473 _____
ECP 401 _____	PHY 122 _____	[d] ECE 471 or	ECE 477 _____

HV&SC + Ethics Course Requirements (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				

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.

Basic Science Course/Grade (4 hrs)[a] _____

Technical Electives/Grades (at least 12 hrs)

Computer Focus #1: _____ Technical Elective #4: _____

Computer Focus #2: _____ Technical Elective #5: _____

Computer Focus #3: _____

In addition to 300 or 400 level computer science technical electives, the following ECE courses satisfy the "Computer Engineering Focus" requirement:

ECE 331	ECE 417	ECE 435	ECE 471
ECE 477	ECE 478	ECE 486	ECE 498 (CEN Focus)

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a The 128 hour total assumes election of ERS102 or BIO 222/223 to concurrently satisfy the Basic Science requirement and the Population & Environment segment of the HV & SC requirement. With this option the 4 credit hours count only once toward the 128 hour total. If an alternative Basic Science course is chosen then the minimum credit hour requirement becomes 131.

b ECE 316 can be replaced with CHB 350 Statistical Process Control and Analysis or MAT 332 Statistics for Engineers.

c MAT 481 Discrete Mathematics can be replaced with COS 250 Discrete Structures.

d Either ECE 471 (Fall) or ECE 477 (Spring) is required.