



Russell Tessier
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Amherst, MA 01003-5110

Department of Electrical and
Computer Engineering
(413) 545-0160

September 10, 2009

Provost Seymour:

The purpose of this letter is to request a minor curriculum change to the Electrical and Computer Engineering (ECE) undergraduate program. As stated in the UMass Faculty Senate guidelines (please see attached) such a minor change may be approved by the Provost following the circulation of a 30 day letter to the Faculty Senate, academic departments, advising offices, and administrative offices.

Currently, the Electrical Engineering and Computer Systems Engineering undergraduate curricula require a sequence of courses which total at least 127 credits each. The flowcharts and descriptions of these course flows are attached. The ECE department has decided via faculty vote to reduce the undergraduate course load by two courses. These courses, shown as Thematic Elective 2 and Thematic Elective 3 on the attached flows, will not be replaced with additional required courses. This course reduction permits more flexibility and a lower course load for ECE undergraduate students. After this reduction, the minimum required credit hours for each program will be 121 credits, which is above the university requirement of 120 credits. I would be happy to answer additional questions regarding this minor program change.

Sincerely,

Russell Tessier
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UNIVERSITY OF MASSACHUSETTS AMHERST
OFFICE OF THE SECRETARY
THE FACULTY SENATE

PROGRAM REVISION APPROVAL FORM

50 COPIES REQUIRED

PROGRAM TITLE: Electrical Engineering/Computer Engineering

PLEASE CHECK: GRADUATE UNDERGRADUATE

DEPARTMENT: Electrical and Computer Engineering HEAD/CHAIR: Christopher Hollot

SCHOOL OR COLLEGE: Engineering DEAN: Michael Malone

Submission Date: 6-23-2009

Proposed Starting Date: 09-01-10

I. PROPOSAL DEVELOPMENT

A. Describe the Proposal.

Currently, the Electrical Engineering and Computer Systems Engineering undergraduate curricula require a sequence of courses which total at least 127 credits each. The flowcharts and descriptions of these course flows are attached. The ECE department has decided via faculty vote to reduce the undergraduate course load by two courses. These courses, shown as Thematic Elective 2 and Thematic Elective 3 on the attached flows, will not be replaced with additional required courses. This course reduction permits more flexibility and a lower course load for ECE undergraduate students. After this reduction, the minimum required credit hours for each program will be 121 credits, which is above the university requirement of 120 credits.

B. Provide a brief overview of the process for developing the Proposal.

The proposal was discussed in the ECE Department's instructional development committee consisting of 12 faculty members. The proposal was unanimously approved. The proposal was then presented to the entire ECE faculty. The proposal was subsequently unanimously approved by the ECE faculty.

II. PURPOSE AND GOALS

Describe the Proposal's purpose and the particular knowledge and skills to be acquired.

By reducing the number of courses required by undergraduates we hope to allow students to more fully explore their remaining coursework. Of course, students can choose to continue to take the additional courses if they wish.

CSE 09-12

Last Name _____

First Name _____

Curriculum Worksheet for the Computer Systems Engineering Classes of 2009 through 2012.

Date: _____

FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR	
Fall [17cr]	Spring [15cr]	Fall [17-18cr]	Spring [17-18cr]	Fall [17cr]	Spring [15-16cr]	Fall [14-16cr]	Spring [14-16cr]
ENGIN 112 Intro. to ECE I [3cr] [Note 1]	ECE 122 Intro. to ECE II (Object-Oriented Programming, Java) [4cr] [Note 1]	ECE 211 Circuit Analysis I [4cr]	ECE 212 Circuit Analysis II [4cr]	ECE 313 Signals & Systems [4cr]	ECE 314 Intro. Prob. & Random Procs. [4cr]	ECE 415 Senior Design Project I [2cr]	ECE 416 Senior Design Project II [2cr]
PHYSICS 151+153 Gen. Physics I - Mechanics + lab [3+1cr]	PHYSICS 152+154 Gen. Physics II - Thermo., E&M. + lab [3+1cr]	ECE 242 Data Structures & Algorithms (w/ Java) [4cr]	ECE 232 Hardware Organization & Design [4cr]	ECE 323 Electronics I [4cr]	ECE 374 Computer Networks & the Internet [3cr]	CSE Elective [3cr] [Note 6]	CSE Elective [3 or 4cr] [Note 6]
MATH 131 Calculus I [4cr]	MATH 132 Calculus II [4cr]	MATH 331 Differential Equations [3cr]	MATH 235 Linear Algebra [3cr]	ECE 353 Computer Systems Lab I [3cr]	ECE 354 Computer Systems Lab II [4cr]	CSE Elective [3 or 4cr] [Note 6]	CSE Elective [3 or 4cr] [Notes 4 & 6]
ENGLWRIT 112 College Writing [3cr] [Note 2]	Social World Elec. [3cr] [Note 2]	Social World Elec. [3cr] [Note 2]	MATH 455 Discrete Structures [3cr] [Note 5]	ECE 373 Software Intensive Engineering [3cr] (formerly ECE 397B)	Thematic Elective 2 [3cr] [Note 4]	Thematic Elective 3 [3 or 4cr] [Note 4]	Social World Elec. [3cr] [Note 2]
Social World Elec. [3cr] [Note 2]		Thematic Elective 1* [3cr] [Note 1]	BIOLOGY 102* [3cr]	ENGIN 351 Writing in Engineering [3cr]	ECE 303 Junior Seminar [1cr]	Social World Elec. [3cr] [Note 2]	Social World Elec. [3cr] [Note 2]
		*See Notes 3 & 4 for details	*See Notes 3 & 4 for details				
		(Take ENGIN 112, Intro. to ECE I, unless it was taken previously. See advisor to adjust schedule. [3cr] [Note 1])					

The curriculum notes can be found on the reverse side of this worksheet.

UNIVERSITY OF MASSACHUSETTS AMHERST • DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

www.ecs.umass.edu/ece/

Updated Sep. 2008

EE 09-12

- Notes for the Electrical Engineering Curriculum for the Classes of 2009 through 2012. -

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 (<http://spire.umass.edu>) be consulted for course descriptions and course requisites. It is the student's responsibility to refrain from enrolling in any course for which she or he does not have all of the published requisites.

Note 1

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
ENGIN 112 is a required course in the CSE and EE programs.*

In the spring semester, choose one of the following:

CHE 120 (ChE)
CEE 121 Intro. to Civil & Env. Engin. II
>> ECE 122 Intro. to ECE II (Object-Oriented Programming)
(Language: Java)

MIE 123 Intro. to Mech. & Industrial Engin. II

Note that ECE 122 or its equivalent is required for CSE and EE majors. It is a prerequisite for ECE 242.

*A student who is admitted to CSE or EE after meeting the first year admission requirements but has taken ENGIN 110, 111 or 113 instead of ENGIN 112 in the first year must take ENGIN 112 in the Fall semester of the second year (This will require either the Thematic Elective or the Social World Elective to be postponed.) A student who earns a C or better in ENGIN 112 after earning a C or better in ENGIN 110, 111 or 113 will be allowed to count ENGIN 110, 111 or 113 as a Thematic Elective.

Note 2 • Social World Electives

Take two of the six social world electives in the first year. First year students either take ENGLWRIT 112 and one Social World Elective in the Fall and one Social World Elective in the Spring, or they take two Social World Electives in the Fall and ENGLWRIT 112 in the Spring.

Over the course of the degree program, choose six Social World Electives consisting of:

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

One of the six Social World electives must carry the G designation and another must carry the U designation.

Note 3 • Biology

CSE and EE students must take either BIOLOGY 100 (offered each Fall semester) or BIOLOGY 102 (offered each Spring semester). (Either course will fulfill the General Education Biological Science (BS) requirement.)

Students who may be interested in pursuing more advanced coursework in Biology should take BIOLOGY 100. This is normally followed by BIOLOGY 101 as the Spring semester Thematic Elective. BIOLOGY 102 is a condensed version of the material in BIOLOGY 100-101 and is the appropriate choice for students who do not plan to pursue further studies in Biology, Biochemistry or Bioengineering.

Note 4 • Thematic Electives

~~Thematic Electives are meant to allow in depth study in a field outside of ECE that is relevant to the student's career objectives and interests. Choose three thematic electives in the same track. If appropriate, an ECE faculty advisor may approve a fourth thematic elective to take the place of one of the four senior electives. It is expected that the list of Thematic Elective tracks and courses will evolve along with industrial and research directions in Electrical and Computer Engineering. Currently there are seven approved thematic elective tracks: (1) Biology/Biochemistry; (2) Chemistry; (3) Physics; (4) General Science (Biology, Chemistry and Physics) (5) Mathematics (6) Physics / Mathematics (7) Engineering Management (Note: This track is only for students who intend to complete the Engineering Management minor.) The official thematic electives document is posted at www.ecs.umass.edu/ece/. Students must take one course from one of the following tracks (1) Biology/Biochemistry; (2) Chemistry; (3) Physics; (4) General Science (Biology, Chemistry and Physics) (5) Mathematics (6) Physics / Mathematics (7) Engineering Management. This course may be at any level.~~

Note 5 • EE Electives

Choose four EE electives. The electives must include at least two 500-level courses that may not be used to fill the requirements for any other major. [If appropriate, an ECE faculty advisor may approve a fourth thematic elective to take the place of one of the four senior electives. A record of the approval must be placed in the student's file.]

EE Electives, in numerical order:

ECE 354 - Computer Systems Lab II (2nd sem) 4cr
ECE 373 Software Intensive Engineering (1st sem)
ECE 374 Computer Networks & the Internet
ECE 558 - Intro. to VLSI Design (1st sem) 4cr
ECE 559 - VLSI Design Project (2nd sem)
ECE 563 - Intro. to Comm. & Signal Processing (1st sem)
ECE 564 - Communication Systems (2nd sem) 4cr
ECE 565 - Digital Signal Processing (2nd sem) 4cr
ECE 571 - Microelectronic Fabrication (2nd sem) 4cr
ECE 572 - Optoelectronics (1st sem)
ECE 580 - Feedback Control Systems (1st sem) 4cr
ECE 584 - Microwave Engineering I (1st sem) 4cr
ECE 585 - Microwave Engineering II (2nd sem)
Some ECE 597 Special Topics courses are allowed. Please inquire at Marcus 8 before enrolling.

CSE 09-12

Last Name _____

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Note 5 • Discrete Mathematics

CMPSCI 250, 4 cr., Introduction to Computation is an approved substitute for MATH 455, 3 cr., Introduction to Discrete Structures. Enrollment priority in CMPSCI 250 is given to CMPSCI students.

Note 6 • CSE Electives

Choose four CSE electives. The electives must include at least two 500-level courses that may not be used to fill the requirements for any other major. [If appropriate, an ECE faculty advisor may approve a fourth thematic elective to take the place of one of the four senior electives. A record of the approval must be placed in the student's file.]

CSE Electives, in numerical order:

ECE 324 - Electronics II (2nd sem)
ECE 333 - Fields and Waves I (2nd sem) 4 cr
ECE 344 - Semiconductor Devices and Materials (1st sem)
ECE 558 - Intro. to VLSI Design (1st sem) 4cr
ECE 559 - VLSI Design Project (2nd sem)
ECE 563 - Intro. to Comm. & Signal Processing (1st sem)
ECE 564 - Communication Systems (2nd sem) 4cr
ECE 565 - Digital Signal Processing (2nd sem) 4cr
ECE 568 - Introduction to Computer Architecture (1st sem)
ECE 570 - System Software Design
ECE 571 - Microelectronic Fabrication (2nd sem) 4cr
ECE 572 - Optoelectronics (1st sem)
ECE 580 - Feedback Control Systems (1st sem) 4cr
Some ECE 597 Special Topics courses are allowed. Please inquire at Marcus 8 before enrolling.

The following CMPSCI course are approved as CSE electives but enrollment in them is not guaranteed. Enrollment priority is given to CMPSCI students.

CMPSCI 311 - Introduction to Algorithms (both sem) 4 cr
CMPSCI 383 - Artificial Intelligence (both sem)
CMPSCI 401 - Formal Language Theory (2nd sem)
CMPSCI 410 - Compiler Techniques (1st sem)
CMPSCI 445 - Information Systems (1st sem)
CMPSCI 520 - Software Engineering: Synthesis (2nd sem)
CMPSCI 521 - Software Engineering: Analysis & Eval. (1st sem)
CMPSCI 530 - Programming Languages (2nd sem)
CMPSCI 570 - Computer Vision (2nd sem)
CMPSCI 585 - Natural Language Processing (1st sem)
CMPSCI 589 - Machine Learning (2nd sem)