May 19, 2010

MEMORANDUM

TO: Darryll Pines  
   Dean, A. James Clark School of Engineering

FROM: Elizabeth Beise  
   Interim Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Modify the Curriculum for the B.S. in Computer Engineering (PCC log no. 09077)

At its meeting on April 30, 2010, the Senate Committee on Programs, Curricula and Courses approved your proposal to modify the curriculum for the B.S. in Computer Engineering. A copy of the approved proposal is attached.

The changes are effective Fall 2010. The School should ensure that the changes are fully described in the Undergraduate Catalog and in all relevant descriptive materials, and that all advisors are informed.

MDC/  
Enclosure

cc: Alex Chen, Chair, Senate PCC Committee  
    Sarah Bauder, Office of Student Financial Aid  
    Reka Montfort, University Senate  
    Erin Howard, Data Administration  
    Donna Williams, Institutional Research & Planning  
    Anne Turkos, Archives  
    Linda Yokoi, Office of the Registrar  
    James Dietz, Undergraduate Studies  
    Gary Pertmer, A. James Clark School of Engineering  
    Patrick O’Shea, Electrical and Computer Engineering
THE UNIVERSITY OF MARYLAND, COLLEGE PARK
PROGRAM/CURRICULUM/UNIT PROPOSAL

- Please email the rest of the proposal as an MSWord attachment to pcc-submissions@umd.edu.
- Please submit the signed form to the Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.

College/School: Engineering
College/School Unit Code-First 8 digits: 01203200
Unit Codes can be found at: https://hypprod.umd.edu/html.Reports/units.htm

Department/Program: Electrical and Computer Engineering
Department/Program Unit code-Last 7 digits: 1320901

Type of Action (choose one):
- Curriculum change (including informal specializations)
- New academic degree/award program
- Renaming of program or formal Area of Concentration
- New Professional Studies award iteration
- Addition/deletion of formal Area of Concentration
- New Minor
- Suspend/delete program
- Other

Italics indicate that the proposed program action must be presented to the full University Senate for consideration.

Summary of Proposed Action:
Change in three of the required sophomore-level courses to modernize, improve the computer engineering curriculum. Increase the number of labs required by no longer allowing ENEE 307 to count for the advanced lab requirement (Category D elective). Change the definition of the “Category F” elective to accept more classes in this category, including ENEE and CMSC courses. No implication for resources.

APPROVAL SIGNATURES - Please print name, sign, and date. Use additional lines for multi-unit programs.

1. Department Committee Chair
   Adrian Papamarcou 12/18/09

2. Department Chair
   Patrick O’Shea 1/13/10

3. College/School PCC Chair
   David Bigio 4/2/10

4. Dean
   Darryll Pines 6/1/10

5. Dean of the Graduate School (if required)

6. Chair, Senate PCC
   4·30·2010

7. University Senate Chair (if required)

8. Vice President for Academic Affairs & Provost
   Nariman Farvardin 5/20/10
COMPUTER ENGINEERING CURRICULUM CHANGE PROPOSAL
REQUIRED INFORMATION

1. Current requirements as shown in the undergraduate catalog:
   See Attachment 1a and 1b.

2. Proposed new requirements:
   See Attachment 2a and 2b.

3. Identification of and rationale for the changes:
   a. Proposed changes:
      (1) Replace ENEE 204 and ENEE 206 with ENEE 205 and ENEE 245.
      (2) Replace ENEE 241 with ENEE 222
      (3) No longer allow ENEE 307 to count as a Category D elective.
      (4) Relax the constraints on the Category F elective.
      (5) Require CMSC 216 to be taken instead of CMSC 212.

   b. Rationale:
      All of the changes listed above were discussed and approved at open meetings of the entire departmental faculty. The changes have been made to improve and better align the current curriculum and introduce tightly coordinated lectures and lab/demos. The final change (CMSC 216) was instigated by the Computer Science Department, but our faculty discussed and approved the change for our computer engineering degree.

   c. Detailed Summary:
      (1) In the current configuration, electric circuit theory is taught in ENEE 204 and practiced in the lab course ENEE 206. About ½ of 206 is dedicated to reinforcing 204 topics and the other half reinforces digital circuit topics. These courses are usually taken concurrently and rarely taught by the same person, making coordination between the two classes a frequent issue. Furthermore, the digital part of the 206 course focuses primarily on technology that is essentially obsolete. The faculty decided to combine the electric circuit theory and experiment into a single course under a single instructor in order to improve the overall quality of the class via improved connection between theory and experiment. The faculty later decided to introduce a two-credit digital lab class, ENEE 245, based on current technology (building circuits with FPGAs and VERILOG).
      (2) ENEE 241 is a numerical methods course that has slowly mutated into a class that is weakly linked to our curriculum. Currently, it is not a prerequisite for any ENEE course. ENEE 222 was designed to extract relevant parts of 241 (like basic treatment of systems of linear equations) and add a digital signal component and a practical component to give students more “hands-on” learning. The new ENEE 222 course would be one credit more than ENEE 241 to reflect that additional contact time and work load.
      (3) It was felt that the computer engineering students would benefit from an additional laboratory course, and this change puts the laboratory component of the computer engineering program on par with the electrical engineering program. Given that both program have the same learning outcomes and objectives with respect to laboratory skills, it was felt important to have this parity.
      (4) The current category F elective requirements stemmed for a pre-2000 ABET requirement. It is no longer a requirement, and a similar change made a few years ago to our electrical engineering program has been very successful (in terms of student satisfaction), so the faculty decided to relax this elective requirement and allow students to take additional breadth or depth courses in computer engineering, if they so choose.
      (5) There would be a net change to the number of credits required for the degree of two, making the total number of credits required for the degree to be 122.
4. A sample program under the proposed requirements:

See Attachment 2a.

All new courses will be taught every semester with the same enrollment levels as their predecessors.

5. Chart showing timetable of course implementation:

See Attachment 3.

6. New Courses:

ENEE 245 is being submitted for approval concurrently with this document. ENEE 205 and ENEE 222 have previously been submitted and approved.

7. Deleted Requirements:

ENEE 241, ENEE 204 and ENEE 206 will be phased out according to Attachment 3. Basically, ENEE 241 and ENEE 204 will stop the same semester that ENEE 205, ENEE 245 and ENEE 222 start, while ENEE 206 will run one semester longer. Any course which currently has ENEE 204 /206 as a prerequisite will be modified to have ENEE 205 as a prerequisite course, or ENEE 245 as a prerequisite, depending on the course content. ENEE 222 will be made a prerequisite for ENEE 322. CMSC 212 will be phased out according to a time-table dictated by the computer science department, but we will accept either CMSC 212 or CMSC 216 for the degree requirements, so the details of the phase out are not important for our students.

8. Other departments impacted by change:

No other departments are impacted by the proposed changes.

9. Students enrolled in the program prior to the curriculum change:

Students who enroll in the Electrical Engineering degree program beginning with the start of the Fall 2010 semester will graduate with the new curriculum.

Students who enrolled in the program prior to Fall 2010, or students who enrolled in parallel programs at other 2- and 4-year universities prior to Fall 2010, will be required to graduate under the old requirements. However, ENEE 222 will be permitted as a substitute for ENEE 241 and ENEE 205 will be permitted as a substitute for ENEE 204. ENEE 245 plus ENEE 205 will be accepted as a substitute for ENEE 204 plus ENEE 206. Anyone who has ENEE 204 but not ENEE 206, must take ENEE 245, and then can take an extra upper level lab as a substitute for ENEE 206 (in addition to the advanced lab required for the degree). ENEE 307 will continue to be accepted as a Category D requirement for students entering in our department or a parallel program before Fall 2010, as long as they matriculate to College Park before Fall 2012. Otherwise, ENEE 307 will NOT count as a Category D elective. Students can elect courses according to the new definition of Category F once these proposed curriculum changes have been approved, since the old Category F courses are a subset of the new Category F course list.
# COMPUTER ENGINEERING
Sample Graduation Plan† for Old Curriculum

## FIRST YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 135</td>
<td>3</td>
<td>I</td>
</tr>
<tr>
<td>PHYS 161</td>
<td>3</td>
<td>II</td>
</tr>
<tr>
<td>MATH 140, 141</td>
<td>4</td>
<td>I, II</td>
</tr>
<tr>
<td>CMSC 132*</td>
<td>4</td>
<td>II</td>
</tr>
<tr>
<td>ENES 100</td>
<td>3</td>
<td>I</td>
</tr>
<tr>
<td>CORE‡</td>
<td>3</td>
<td>I, II</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>13, 14</td>
<td></td>
</tr>
</tbody>
</table>

## SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 246</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CMSC 212</td>
<td>4</td>
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<tr>
<td>CMSC 250</td>
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<td>CMSC 351</td>
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<td>PHYS 260/261</td>
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<tr>
<td>ENEE 241</td>
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<td>ENEE 204</td>
<td>3</td>
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<tr>
<td>ENEE 206</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENEE 244</td>
<td>3</td>
<td></td>
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<tr>
<td>ENEE 200</td>
<td>3</td>
<td></td>
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<tr>
<td><strong>Total Credits</strong></td>
<td>15, 17</td>
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</tr>
</tbody>
</table>

## JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSC 330</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CMSC 412</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENEE 303</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 307</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENEE 322</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 324</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 350</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 446</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CORE‡</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td>17, 13</td>
<td></td>
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</table>

## SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECH ELEC</td>
<td>12, 10</td>
<td></td>
</tr>
<tr>
<td>ENGL 393</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CORE‡</td>
<td>3</td>
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<tr>
<td><strong>Total Credits</strong></td>
<td>15, 16</td>
<td></td>
</tr>
</tbody>
</table>

† The minimum number of credits required to earn a degree is 120 credits.
‡ NOTE: Schedule assumes one CORE class satisfies the CORE Cultural Diversity requirement.
* Students may need to take CMSC 131 or an exemption exam before taking CMSC 132.
Computer Engineering Curriculum (old curriculum)

Approved Technical Electives

All BSCP graduates must complete a range of technical electives designed to ensure they have the appropriate breadth and depth of training in the basic sciences and engineering, a rigorous advanced laboratory experience, and a sophisticated and sustained exposure to engineering design. Students who completed ENEE302 are required to complete 24 credits of technical electives selected from among the six categories listed below. Students who have completed or who are required to complete ENEE303 and 307 must complete 22 credits of technical electives. (The 2-credit reduction is because ENEE307 satisfies the Category D requirement.)

Category A: Mathematics and Basic Science Electives: minimum of 6 credits

Category B: Computer Science Theory and Applications: minimum of 3 credits

Category C: Electrical Engineering Theory and Applications: minimum of 3 credits

Category D: Advanced Laboratory: minimum of 2 credits

Category E: Capstone Design: minimum of 3 credits

Category F: Engineering (no ENEE or CMSC courses): 3 credits

Free Electives: No minimum credits required.

Category D: Advanced Laboratory (minimum 2 credits)

- ENEE 307 Electronic Circuits Design Laboratory (2)
- ENEE 407 Microwave Circuits Laboratory (2)
- ENEE 416 Integrated Circuit Fabrication Laboratory (3)
- ENEE 417 Microelectronics Design Laboratory (2)
- ENEE 419W Advanced Operational Amps Lab (3)
- ENEE 428 Communication Design Laboratory (2)
- ENEE 445 Computer laboratory (2)
- ENEE 459N Neural Networks Design and Implementation Laboratory (2)
- ENEE 461 Control Systems Laboratory (2)
- ENEE 486 Optoelectronics Laboratory (2)

Category F: Engineering (not Electrical or Computer) (minimum 3 credits)

Any engineering course (ENxx) at the 300 or 400-level that is neither electrical nor computer engineering in nature is acceptable provided it has at least one 200-level prerequisite in mathematics, the science, or engineering. Visit the Category F webpage for a list of currently approved courses.

Old Curriculum
Attachment 1b
# Computer Engineering

Sample Graduation Plan for New Curriculum

## First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 135</td>
<td>General Chemistry</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHYS 161</td>
<td>General Physics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH 140, 141</td>
<td>Calculus I, II</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>CMSC 132*</td>
<td>Object Oriented Programming II</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENES 100</td>
<td>Intro. to Engineering Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 200</td>
<td>Society, Ethics, and ECE (CORE IE)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CORE‡</td>
<td>General Education</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td>13</td>
<td>17</td>
</tr>
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## Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 246</td>
<td>Differential Equations</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CMSC 216</td>
<td>Introduction to Computer Systems</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CMSC 250</td>
<td>Discrete Structure</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CMSC 351</td>
<td>Algorithms</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHYS 260/261</td>
<td>General Physics</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENEE 222</td>
<td>Elements of Discrete Signal Analysis</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENEE 205</td>
<td>Electric Circuits</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENEE 244</td>
<td>Digital Logic Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 245</td>
<td>Digital Circuits and Systems Laboratory</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td>15</td>
<td>16</td>
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</table>

## Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSC 330</td>
<td>Organization of Prog. Languages</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CMSC 412</td>
<td>Operating Systems</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENEE 303</td>
<td>Analog and Digital Electronics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 307</td>
<td>Electronics Circuits Design Lab</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENEE 322</td>
<td>Signal and System Theory</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 324</td>
<td>Engineering Probability</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 350</td>
<td>Computer Organization</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENEE 446</td>
<td>Computer Design</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CORE‡</td>
<td>General Education</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td>17</td>
<td>13</td>
</tr>
</tbody>
</table>

## Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Electives</td>
<td>12</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>ENGL 393</td>
<td>Junior English</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CORE‡</td>
<td>General Education</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

‡ NOTE: Schedule assumes one CORE class satisfies the CORE Cultural Diversity requirement.
* Students may need to take CMSC 131 or an exemption exam before taking CMSC 132.
Computer Engineering Curriculum (new curriculum)

Approved Technical Electives

All BSCP graduates must complete a range of technical electives designed to ensure they have the appropriate breadth and depth of training in the basic sciences and engineering, a rigorous advanced laboratory experience, and a sophisticated and sustained exposure to engineering design. Students must complete 22 credits of technical electives.

Category A: Mathematics and Basic Science Electives: minimum of 6 credits

Category B: Computer Science Theory and Applications: minimum of 3 credits

Category C: Electrical Engineering Theory and Applications: minimum of 3 credits

Category D: Advanced Laboratory: minimum of 2 credits

Category E: Capstone Design: minimum of 3 credits

Category F: General technical elective: minimum of 3 credits

Free Electives: No minimum credits required.

Category D: Advanced Laboratory (minimum 2 credits)

ENEE 407 Microwave Circuits Laboratory (2)
ENEE 416 Integrated Circuit Fabrication Laboratory (3)
ENEE 417 Microelectronics Design Laboratory (2)
ENEE 419W Advanced Operational Amps Lab (3)
ENEE 428 Communication Design Laboratory (2)
ENEE 445 Computer laboratory (2)
ENEE 459N Neural Networks Design and Implementation Laboratory (2)
ENEE 461 Control Systems Laboratory (2)
ENEE 486 Optoelectronics Laboratory (2)

Category F: General technical elective (minimum 3 credits)

Any 300 or 400-level course which uses the following prefixes and is not on the list of prohibited classes can be used to fulfill this requirement, provided it has at least one 200-level prerequisite in mathematics, science, or engineering.

AMSC, BCHM, BIOE, BSCI, CHEM, CMSC, ENAE, ENBE, ENCE, ENCH, ENEE, ENES, ENFP, ENMA, ENME, ENNU, ENRE, MATH, PHYS, and STAT.
## Timetable for Course Introduction/Elimination of Courses

The timetable for the introduction of the new courses and the phasing-out of the existing courses appears below. An 'X' indicates the course will be offered during that term. Steady-state has been reached by the year 2012.

<table>
<thead>
<tr>
<th>Course Transition</th>
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</thead>
<tbody>
<tr>
<td><strong>Old Courses</strong></td>
</tr>
<tr>
<td>ENEE204</td>
</tr>
<tr>
<td>ENEE206</td>
</tr>
<tr>
<td>ENEE241</td>
</tr>
<tr>
<td><strong>New Courses</strong></td>
</tr>
<tr>
<td>ENEE205</td>
</tr>
<tr>
<td>ENEE222</td>
</tr>
<tr>
<td>ENEE 245</td>
</tr>
</tbody>
</table>

Attachment 3
## University of Maryland Course Proposal Form

**Department/Program:** ENEE  
**College/School:** ENGR  
**Action:** add  
**Credits:** Minimum 2 Maximum 2  
**Repeatable to a maximum of 0 if content differs**

<table>
<thead>
<tr>
<th>Course Prefix and Number: ENEE245</th>
<th>Transcript Title: Digital Circuit Soph Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title: Digital Circuits and Systems Laboratory</td>
<td></td>
</tr>
<tr>
<td>Credits: Minimum 2 Maximum 2</td>
<td>Repeatable to a maximum of 0 if content differs</td>
</tr>
<tr>
<td>Hour commitment per week: Lecture: 1 Internship: Discussion: Laboratory: 3 Seminar:</td>
<td></td>
</tr>
<tr>
<td>Can this course be waived through an AP exam? No</td>
<td></td>
</tr>
<tr>
<td>Has this course been approved to fulfill a CORE distribution requirement? No</td>
<td></td>
</tr>
<tr>
<td>Grading Method: Regular (R)</td>
<td>Formerly: n/a</td>
</tr>
<tr>
<td>Prerequisite(s): ENEE244 and (ENEE150 or CMSC132)</td>
<td></td>
</tr>
<tr>
<td>Corequisite(s): none</td>
<td></td>
</tr>
<tr>
<td>Recommended course(s): none</td>
<td></td>
</tr>
<tr>
<td>Restrictions: 09090 or 09991 majors only. Grade of C or higher in ENEE 244, and ENEE 150 or CMSC 132. Permission of Department.</td>
<td></td>
</tr>
<tr>
<td>Crosslisted with: n/a</td>
<td></td>
</tr>
<tr>
<td>Shared with: n/a</td>
<td></td>
</tr>
<tr>
<td>Credit will be given for only one of the following courses: n/a</td>
<td></td>
</tr>
<tr>
<td>Will this course be offered at another location or through an alternate delivery method? No</td>
<td></td>
</tr>
<tr>
<td>Catalog Description: Introduction to basic measurement techniques and electrical laboratory equipment (power supplies, oscilloscopes, voltmeters, etc.). Design, construction, and characterization of digital circuits containing logic gates, sequential elements, oscillators, and digital integrated circuits. Introduction to digital design and simulation with the Verilog Hardware Description Language (HDL).</td>
<td></td>
</tr>
<tr>
<td>Reason for proposal/comments: Modernize sophomore digital labs class.</td>
<td></td>
</tr>
<tr>
<td>Early Warning Grades: Yes</td>
<td>Inclement Weather Procedures: Yes</td>
</tr>
<tr>
<td>Academic Integrity / Honor Pledge: Yes</td>
<td>Accommodations for students with disabilities: Yes</td>
</tr>
</tbody>
</table>
| Learning Outcomes: A. Use simulation, test, and measurement equipment necessary to evaluate the functionality and performance of simple circuits  
B. Understand basic limitations, inaccuracies, and tolerances of the test equipment, components, and procedures  
C. Design digital circuits and systems to efficiently, reliably, and economically achieve desired results  
D. Master techniques for modeling circuits and systems through structural and gate-level networks, and breadboarding designs; trouble shooting circuits and systems  
E. Use hardware description languages and simulation tools to design circuits and systems and analyze their performance  
F. Work cooperatively with others in the lab to maximize results | |
| Assessment Policy: Graded lab assignments only. Lab attendance required. University policies for excused absences (including religious observance) will be strictly enforced. | |
Lab assignments/notes will be distributed to the students through the class web site  
Verilog HDL tutorial documents will be distributed to the students through the class web site | |
| Course Pedagogy and Format: One hour of lecture and three hours of lab every week. Approximate weekly schedule:  
1. Measurement Equipment  
2. Verilog Structural and Gate-Level Modeling | |
3. Simulation Environment for Schematics and Verilog Models
5. Adder Circuits: Full-adder Components, Ripple-carry and Carry-Lookahead Structures
8. Digital Data Representation and Conversions. Subtractor Design based on Addition
10. Multiplier Circuits (Combinational and Sequential)
11. Digital Calculator Implementation
12. First-In First-Out (FIFO) Buffer Design
13. Error Detection and Correction Codes
Course Prefix and Number: ENEE205  

Transcript Title: Electric Circuits  

Title: Electric Circuits  

Credits: Minimum 4 Maximum 4  

Repeatable to a maximum of 0 if content differs  

Hour commitment per week: Lecture: 3 Internship: Discussion: 1 Laboratory: 2 Seminar:  

Can this course be waived through an AP exam? No  

Has this course been approved to fulfill a CORE distribution requirement? No  

Grading Method: Regular (R)  

Formerly: ENEE204  

Prerequisite(s): A grade of C or higher in PHYS260  

Corequisite(s): MATH246  

Recommended course(s):  

Restrictions: 09090 or 09991 majors only. Permission of Department.  

Croslisted with:  

Shared with:  

Credit will be given for only one of the following courses: ENEE204 and ENEE205  

Will this course be offered at another location or through an alternate delivery method? No  


Reason for proposal/comments: Recommendation of self-evaluation committee to modernize course and improve coordination between lecture and lab. Approved by vote of the general faculty for incorporation into both electrical and computer engineering degrees.  

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For use by Registrar's Office only

Effective Term:  

Repeat Table:  

Prereq pop-up:  

Entered/date:  

Verified:  

Vice President for Academic Affairs & Provost  

Effective Term
Course Syllabus: ENEE 205: Electric Circuits, 4 Credits

Course Description

Course Objective
A. Learn the programming and software development flow: write program in a high level language (C); compile, debug, and execute under an operating system; and document the program.
B. Learn how to solve real life problems by programming.
C. Learn the fundamental data types.

Topics Covered
1. Programming environment: editing, compiling, and basic UNIX concepts
2. Data types and variable scope
3. Program selection (control flow)
4. Formatted input/output
5. Basic file input/output
6. Functions
7. Arrays
8. Strings

Grading Method
Grades will be based on a combination of homeworks, quizzes, exams, and projects

Prerequisite
none

Textbook
Handouts made available by the instructor, and selected readings from the literature on programming fundamentals

Syllabus Prepared by: Drs. Shuvra Bhattacharyya, Gang Qu, and Donald Yeung
Course Prefix and Number: ENEE222

Title: Elements of Discrete Signal Analysis

Transcript Title: Discrete Signal Analysis

Credits: Minimum 4 Maximum 4
Repeatable to a maximum of 0 if content differs

Hour commitment per week: Lecture: 3 Internship: Discussion: 2 Laboratory: Seminar:

Can this course be waived through an AP exam? No

Has this course been approved to fulfill a CORE distribution requirement? No

Grading Method: Regular (R)
Formerly: ENEE241

Prerequisite(s): A grade of C or higher in ENEE 441
Math 141

Corequisite(s):

Recommended course(s):

Restrictions: 09090 or 09991 majors only. Permission of Department.

Crosslisted with:

Shared with:

Credit will be given for only one of the following courses: ENEE241 or ENEE222

Will this course be offered at another location or through an alternate delivery method? No

Catalog Description: Discrete-time and continuous-time signals, sampling. Linear transformations, orthogonal projections. Discrete Fourier Transform and its properties. Fourier Series. Introduction to discrete-time linear filters in both time and frequency domains.

Reason for proposal/comments: Recommendation of self-evaluation committee to modernize course and improve alignment with junior-level courses. Approved by vote of the general faculty for incorporation into both electrical and computer engineering degrees.

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Dept. PCC Chair (print name, sign, date)

Dept. Chair (print name, sign, date)

College/School PCC Chair (print name, sign, date)

Dean (print name, sign, date)

Effective Term

Repeat Table

Prereq pop-up

Entered/date

Verified

Effective Term

Vice President for Academic Affairs & Provost