UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Charles Bonclet phone number 831-8008

Department: Electrical & Computer Engineering email address bonclet@udel.edu

Date: Nov 18, 2010

Action: Revise Bachelors in Electrical Engineering degree

(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term: 11F

(use format 04F, 05W)

Current degree: BEE

(Example: BA, BACH, BACI, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: BEE

(Example: BA, BACH, BACI, HBA, EDD, MA, MBA, etc.)

Proposed name: BEE

Proposed new name for revised or new major / minor / concentration / academic unit
(if applicable)

Revising or Deleting:

Undergraduate major / Concentration: BEE

(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor:

(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change:

(Must attach your Graduate Program Policy Statement)

Graduate Program of Study:

(Example: Animal Science: MS Animal Science: PhD Economics: MA Economics: PHD)

Graduate minor / concentration:

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations)?
(Be aware that approval of the curriculum is dependent upon these courses successfully passing through
the Course Challenge list. If there are no new courses enter “None”)

**Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education:** [http://www.ugs.udel.edu/gened/](http://www.ugs.udel.edu/gened/)

Proposed changes will enhance the following goals:

- Goal 3: the expansion of the design requirement will foster greater teamwork and collaboration skills
- Goal 4: engineering design projects often involve questions of ethics and responsibilities to the community at large
- Goal 7: Design is all about integrating classroom knowledge with real world experience.

**Identify other units affected by the proposed changes:**
(Attach permission from the affected units. If no other unit is affected, enter “None”)

None.

**Describe the rationale for the proposed program change(s):**
(Explain your reasons for creating, revising, or deleting the curriculum or program.)

**DESCRIPTION:**

We propose the following changes to the BEE degree program:

1. CISC 220 will be taken in the fall of the sophomore year (it is currently taken in the spring) and CPEG 222 will be taken in the spring of the sophomore year (it is currently in the fall).
2. The design requirement is increased from 4 to 6 credits.
3. Two new senior capstone design courses are required: ELEG 498 and 499.
4. The “foundation elective” requirement is reduced from “take 4 of the following 6 courses: ELEG 306, ELEG 312, ELEG 341, ELEG 403, ELEG 413, and ELEG 418” to “take 3 of the following 5 courses: ELEG 306, ELEG 312, ELEG 403, ELEG 413, and ELEG 418”.
5. The overall credit requirement is reduced from 126 credits to 125 credits.

**RATIONALE AND DEMAND:**

The changes are two-part: Firstly, the sequencing of CISC 220 and CPEG 222 is flipped. This change is needed because CPEG 222 relies on students knowing the C programming language. Previously, CISC 181 taught C. Now, CISC 181 teaches Java. CISC 220 is the first C language class. Accordingly we need to postpone CPEG 222 until after CISC 220. The CIS department is aware of, and has approved, this change.

Secondly, we believe the students need a strong design experience to punctuate their undergraduate degree. Accordingly, we are increasing the design requirement from one 4 credit course to two 3 credit courses.

To adjust the number of credits, we are reducing the number of “foundation electives” (mostly background theory courses) from four to three. One course, ELEG 341, was dropped from the foundation elective list as it is not regularly offered and is not “foundational” in the sense of the others on the list.

Adding two design credits and subtracting three foundation elective credits results in a reduction of the overall credit load to 125 credits from 126 credits.

We anticipate this change to have a negligible affect on demand for the BEE major.

**RESOURCES:**
No additional resources are requested for these changes.

**Program Requirements:**
(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.)

**ROUTING AND AUTHORIZATION:** (Please do not remove supporting documentation.)

Department Chairperson ____________________________ Date __11/22/10__________

Dean of College ____________________________ Date __12/8/10__________

Chairperson, College Curriculum Committee ____________________________ Date __12/6/2010__________

Chairperson, Senate Com. on UG or GR Studies ____________________________ Date ________

Chairperson, Senate Coordinating Com ____________________________ Date ________

Secretary, Faculty Senate ____________________________ Date ________

Date of Senate Resolution ____________________________ Date to be Effective ________

Registrar ____________________________ Program Code ________ Date ________

Vice Provost for Academic Affairs & International Programs ____________________________ Date ________

Provost ____________________________ Date ________

Board of Trustee Notification ____________________________ Date ________

Revised 02/09/2009 /khs
Proposed – shaded rows indicate changed ELEG course credits

**UD Catalog, Bachelor of Computer Engineering degree program to read:**

**UNIVERSITY REQUIREMENTS**

- **ENGL 110** Critical Reading and Writing (minimum grade C-) .............................. 31F
- First Year Experience (FYE) ............................................................................. 0-4
- Breadth Requirements ...................................................................................... 12
- Discovery Learning Experience (DLE) ............................................................ 3
- Multi-cultural Courses ...................................................................................... 3

**MAJOR REQUIREMENTS**

**Breadth Requirements** .................................................................................... 21

The College of Engineering requires 21 total credits, which includes 9 additional credits above and beyond the 12 University Breadth Requirement credits. Coursework may include courses from the University Breadth Requirement list and the College of Engineering Supplemental Course list. See College of Engineering Breadth Requirements for a detailed description. For timely progress toward degree completion, 3 credits must satisfy the University multi-cultural requirement. All courses must be passed with a minimum grade of C-.

One of the following four courses must be taken: ................................................. 33F
- **ENGL 301** Expository Writing
- **ENGL 312** Written Communications in Business
- **ENGL 410** Technical Writing
- **ENGL 413** Topics in Professional Writing

- **EGGG 101** Introduction to Engineering .......................................................... 21F
- **MATH 241** Analytic Geometry and Calculus A .............................................. 41F
- **MATH 242** Analytic Geometry and Calculus B .............................................. 41S
- **MATH 243** Analytic Geometry and Calculus C .............................................. 42F
- **MATH 341** Differential Equations with Linear Algebra I ................................. 32S
- **MATH 342** Differential Equations with Linear Algebra II ............................... 33F
- **PHYS 207** Fundamentals of Physics I ............................................................... 41S
- **PHYS 208** Fundamentals of Physics II ............................................................. 42F
- **CHEM 103** General Chemistry ...................................................................... 41F
- **CISC 106** Introduction to Computer Science I ................................................. 31F
- **CISC 181** Introduction to Computer Science II ............................................... 31S
- **CISC 220** Data Structures ............................................................................. 32F
- **CISC 361** Operating Systems ....................................................................... 33S

Students with adequate programming experience may substitute the CISC 181, CISC 200 and CISC 280 sequence for the CISC 105, CISC 181 and CISC 220 sequence.

- **CPEG 202** Introduction to Digital Systems ..................................................... 31S
- **CPEG 222** Microprocessor Systems ................................................................ 42S
- **CPEG 323** Introduction to Computer System Engineering ............................ 33F
- **CPEG 324** Computer Systems Design I ......................................................... 33S
- **CPEG 419** Computer Communication Networks .......................................... 34F
- **ELEG 205** Analog Circuits I ......................................................................... 42F
- **ELEG 305** Signals and Systems ..................................................................... 32S
- **ELEG 309** Electronic Circuit Analysis I ............................................................ 42S
- **ELEG 310** Random Signals and Noise ............................................................. 33S
- **ELEG 320** Field Theory I .............................................................................. 43F
- **ELEG 491** Ethics and Impacts of Engineering .................................................. 24S

Three of the following six courses must be taken: .............................................. 35, 4F
- **ELEG 306** Digital Signal Processing
- **ELEG 312** Electronic Circuit Analysis II ....................................................... 9
- **ELEG 403** Communication Systems Engineering
- **ELEG 413** Field Theory II
- **ELEG 418** Digital Control Systems

**Design Requirement**

In addition to the content of the normal program, every student must take at least six credits in ELEG course designated as "design." Regularly offered ELEG design
courses include ELEG 498 offered in the fall and ELEG 499 offered in the spring.

**Technical Electives**

In addition to the design requirement, each student, in consultation with their advisor, must select a program of technical electives satisfying the following: (1) With some exceptions, technical electives consist of 300-level or above engineering, mathematics, natural sciences, and computer science courses. With the permission of the student's advisor, certain 200-level courses, such as PHYS 211, are permitted. (2) At least 15 technical elective credits must be taken. (3) Of the 15 technical elective credits, at least 9 must be in ELEG or CPEG courses. (4) Of the 9 credits in ELEG or CPEG, at least 6 must be in 400-level or above ELEG or CPEG courses.

**CREDITS TOTAL A MINIMUM OF**