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: _____ Richard Braun _______ phone number __ x1869 ____________
Department: Mathematical Sciences _______ email address __ braun@math.udel.edu__

Action: _____ Create Certificate in Computational Science and Engineering
(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 09F
(use format 04F, 05W)

Current degree ______ not applicable
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: leads to a certificate
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: Certificate in Computational Science and Engineering
Proposed new name for revised or new major / minor / concentration / academic unit
(if applicable)

Revising or Deleting:

Undergraduate major / Concentration:
(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”)

One new course is being created in Mathematical Sciences: MATH 607 Survey of Scientific Computing. This course is a fast moving survey of methods that will be useful for students interested in the certificate program. The course includes methods not included in the current courses in this area in MATH (MATH 611, 612 and 838), and it was created in response to requests from Electrical and Computer Engineering, and to help provide continuous opportunity for professional students to take required courses for this certificate program.

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education:
http://www.ugs.udel.edu/gened/
This is a post-baccalaureate certificate program, but it could be taken by simultaneous BS-MS students. The certificate would benefit such students by providing an interdisciplinary study opportunity involving 7 departments and two colleges.

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

The following departments are involved from Arts and Sciences: Mathematical Sciences, Physics and Astronomy, and Computer and Information Sciences. The following departments are involved from Engineering: Chemical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, and Mechanical Engineering. Letters of support from each department are included in the attached program policy statement.

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

A group of faculty from across campus wish to create a Certificate in Computational Science and Engineering at the University of Delaware. The philosophy of the program is that we increase the capabilities and understanding of the student in a broad range of areas utilizing floating point or symbolic computation for solving medium to large scale problems in computational mathematics, science and engineering.

This is an interdisciplinary program currently involving seven departments and two colleges (Arts & Science and Engineering). The post-baccalaureate Certificate in Computational Science and Engineering may be completed with non-degree graduate status or as part of a graduate degree program. Students in this certificate program may thus have full- or part-time status.

This program grew out a series of meetings from faculty and students interested in Computational Science and Engineering that began in the 06F semester; these meetings were organized by P. Monk (Mathematical Sciences). The Certificate program was developed in a joint effort by the following members of an ad hoc committee beginning in the 08S semester: R. Braun (Mathematical Sciences), A. Beris (Chemical Engineering), J. MacDonald, (Physics and Astronomy), L. Pollock (Computer and Information Sciences), M. Shay (Physics and Astronomy), M. Taufer (Computer and Information Sciences), L-P. Wang (Mechanical Engineering), D. Weile (Electrical and Computer Engineering) and P. Monk. This program also benefited from significant input from a number of other faculty, notably D. Saunders (Computer and Information Sciences). The purpose of describing these origins is to demonstrate the interdisciplinary nature of the program and the interest of a wide range of faculty in making the program a success.

A more extensive description of the program is attached.

**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.)

Appendix C of the attached document is a draft course catalog entry; please see that document.

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

- Department Chairperson _______________________________ Date ______________
- Dean of College _______________________________ Date ______________
- Chairperson, College Curriculum Committee _______________________________ Date ______________
- 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 _______________________________