

UNIVERSITY OF MASSACHUSETTS AMHERST
OFFICE OF THE SECRETARY
THE FACULTY SENATE

PROGRAM REVISION APPROVAL FORM

50 COPIES REQUIRED

PROGRAM TITLE: Materials Engineering Certificate Program

PLEASE CHECK: GRADUATE UNDERGRADUATE

DEPARTMENT: ChE and MIE

HEAD/CHAIR: Profs. T. J. Mountziaris (ChE) and D. L. Fisher (MIE)

SCHOOL OR COLLEGE: College of Engineering

DEAN: Prof. T. E. Djaferis

Submission Date: 9/15/2009

Proposed Starting Date: 9/1/2010

I. PROPOSAL DEVELOPMENT

A. Describe the Proposal.

Development of a 15-credit certificate program in Materials Engineering. The program will benefit undergraduate students pursuing B.S. degrees within the College of Engineering (COE) with professional interests in Materials Engineering. The curriculum for this program will also benefit graduate students in the Physical Sciences and Engineering with research and professional interests in Materials Science and Engineering. The proposed program addresses a major educational and training need within COE and within UMass Amherst, in general.

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

The Materials Engineering Certificate Program (MECP) is one of three new programs, the development of which has been approved and funded by COE. This was the outcome of a successful proposal that was submitted in response to a request under COE's "Engineering our Future" Initiative during the 2007-08 Academic Year [Prof. D. Maroudas, ChE, PI; Profs. J. I. Goldstein, MIE, R. W. Hyers, MIE, T. J. Mountziaris, ChE, and Dr. M. R. Gungor, ChE, Co-PIs]. We have developed a 15-credit curriculum for the MECP, including a comprehensive portfolio of curricular materials for the required courses. The proposed curriculum takes advantage of several existing courses currently offered in COE departments and introduces some new courses. Proposals for the new courses have been submitted, or are currently being submitted, to the Faculty Senate for approval. The new courses will be offered initially as experimental courses. Detailed course descriptions and syllabi for all the certificate courses are available. All the required information, including course syllabi, has been attached to the experimental course approval forms. Proposed Curriculum: MIE 201: Introduction to Materials Science and Engineering (3 credits); MIE/ChE 590C: Mechanical Behavior of Materials (3 credits); MIE/ChE 590F: Mechanical Behavior of Materials Laboratory (1 credit) for certificate students only; ChE/MIE 590I: Physical and Chemical Processing of Materials (3 credits); ChE/MIE 590J: Physical and Chemical Processing of Materials Laboratory (1 credit) for certificate students only; ChE/MIE 590M: Advanced Materials Engineering; and ChE/MIE 590L: Materials Science and Engineering Project.

II. PURPOSE AND GOALS

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

MECP involves specialized study in Materials Engineering with most of the requirements extending beyond the requirements of any individual major within COE and within the University, in general. The certificate students will acquire skills and knowledge specific to the discipline (or, as it is usually regarded, the interdisciplinary field) of Materials Science and Engineering. In addition to the required introduction to Materials Science and Engineering, this includes the mechanical behavior of materials, the physical and chemical processing of materials, and the advanced engineering of metals, ceramics & glasses, composite materials, and electronic materials. The 15-credit package includes 12 credits from classroom instruction in four courses, 2 credits from laboratory instruction, and 1 credit from a project. The proposed Materials Engineering Certificate Program will fill a major gap in education and training in our COE with an expected long-term impact on student enrollment and retention; there are excellent employment opportunities for students with BS degrees in Engineering and a certified background in Materials Engineering. We envision that the program will grow into a joint degree program throughout COE. There is also potential for long-term growth of the program to become a national center of excellence in Materials Engineering. This will be enabled by an outstanding-quality faculty in the COE with long track records in materials research and education, ready to deliver an excellent certificate program (with a vision for developing future degree programs) in materials.