

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: Michael Santare phone number x-2246

Department: Mechanical Engineering email address santare@udel.edu

Date: November 12, 2010

Action: Policy change for graduate program
(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 11 F
(use format 04F, 05W)

Current degree _____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

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

Proposed name: _____
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: Program Policy Statement Attached
(Must attach your Graduate Program Policy Statement)

Graduate Program of Study: Ph.D. in Mechanical Engineering; Master of Science in Mechanical Engineering (MSME); and Master of Engineering: Mechanical (MEM)
(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")

NONE

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: <http://www.ugs.udel.edu/gened/>

NOT APPLICABLE

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.)

The field of Mechanical Engineering is quickly changing due to global pressures and the impact of new and emerging technologies. Consequently, the faculty in Mechanical Engineering at UD is becoming increasingly diverse in its research pursuits, working in areas such as nanotechnology, biomedical engineering, energy conversion and environment, which are outside the traditional mainstream of mechanical engineering. This has led to the desire to create a more flexible graduate program, so that students with different backgrounds and interests can study and conduct research in these areas that cross traditional academic boundaries while earning their graduate degree in mechanical engineering. At the same time, the faculty wanted to have a way to assess the students' research potential early on in their Ph.D. studies.

This proposal addresses these concerns by changing the format of the Ph.D. Qualifying Examination and in so doing allows a simplification of the graduate degree program rules. The new Qualifying Exam eliminates one of three existing written qualifying exams and replaces it with a short oral presentation of selected papers in the students' research area of interest. This "Research Aptitude Exam" is designed to test a key element of the students' research potential; the ability to read, understand and interpret the literature. In addition, since each student's exam is based on his or her own research area, it allows for more flexibility in coursework selection. Therefore, as an adjunct to the modification of the qualifying exam, the department has also decided to simplify the course requirements by eliminating the "Template" wording from its policy statements for all three degrees.

This style of exam is currently used at some other departments around the US and at UD, and the department has tailored this particular Research Aptitude Exam to fit its current student population as well as to promote its strategic goals for the future.

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.)

See attached Graduate Program Policy documents

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

Department Chairperson *[Signature]* Date 11/29/2010
Dean of College *[Signature]* Date 12/8/10
Chairperson, College Curriculum Committee *[Signature]* Date mtg 11/22/2010
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

MASTER of SCIENCE in MECHANICAL ENGINEERING (MSME)

The Master of Science in Mechanical Engineering (MSME) program consists of 24 credit hours of graduate level coursework, plus 6 credits of Master's Thesis. Coursework must be completed with a grade point average of 3.0 or higher. The requirements are designed both to provide a balanced program in Mechanical Engineering and to allow for a degree of specialization. Students should be able to complete all degree requirements, including the thesis, in 18 to 24 months of full-time study.

I. Course Requirements

A. The following four courses are required (12 credits):

- MEEG 690 Intermediate Engineering Mathematics
- Three from the following list:
 - MEEG 610 Intermediate Solid Mechanics
 - MEEG 620 Intermediate Dynamics
 - MEEG 630 Intermediate Fluid Mechanics
 - MEEG 640 Intermediate Heat Transfer
 - MEEG 683 Orthopedic Biomechanics

Students may petition the Graduate Committee to substitute a more advanced (e.g., 800-level) course on the same topic for one of these required courses.

B. One additional graduate level course (3 credits) in mathematics or numerical methods. The student makes this selection with the documented approval of the Department's Graduate Committee which has the authority to decide on acceptable courses.

C. Three additional elective graduate level courses (9 credits) in engineering or mathematical, physical or biological sciences. The student makes these selections with the documented approval of the department's Graduate Committee which has the authority to decide on acceptable courses.

D. 6 credits of MEEG 869 Master's Thesis.

II. Thesis Requirements A thesis is required which demonstrates the student's ability to conduct scholarly research. Entering graduate students are expected to choose a thesis advisor and research topic during their first semester in the Department so that they can initiate research and choose appropriate elective courses.

At the completion of the thesis research, candidates for the MSME degree must defend their thesis orally to a committee of at least three faculty members. The committee will be chaired by the thesis advisor who, along with at least one other

committee member, must be regular full-time faculty in the Department of Mechanical Engineering. The thesis is to be submitted to committee members at least two weeks in advance of the defense and shall meet the academic and professional standards set forth by the University. Upon acceptance of the thesis, the Committee recommends approval to the Department Chairperson.

MASTER of SCIENCE in MECHANICAL ENGINEERING (MSME)

The Master of Science in Mechanical Engineering (MSME) program consists of 24 credit hours of graduate level coursework, plus 6 credits of Master's Thesis. Coursework must be completed with a grade point average of 3.0 or higher. The requirements are designed both to provide a balanced program in Mechanical Engineering and to allow for a degree of specialization. Students should be able to complete all degree requirements, including the thesis, in 18 to 24 months of full-time study.

I. Course Requirements

A. The following five courses are required (15 credits):

- MEEG 690 Intermediate Engineering Mathematics
- Two from the following list of '*traditional*' mechanical engineering courses:
 - MEEG 610 Intermediate Solid Mechanics
 - MEEG 620 Intermediate Dynamics
 - MEEG 630 Intermediate Fluid Mechanics
 - MEEG 640 Intermediate Heat Transfer
- Two additional courses either from the list immediately above or from a list (template) of approved ME '*non-traditional*' mechanical engineering courses. Approved templates include:
 - Biomedical engineering: MEEG 683 plus one course selected from MEEG 612, 682, 684, 685, 686.

Students may petition the Graduate Committee to substitute a more advanced (e.g., 800-level) course on the same topic for one of these required courses.

B. One additional graduate level course (3 credits) in mathematics or numerical methods. The student makes this selection with the documented approval of the Department's Graduate Committee which has the authority to decide on acceptable courses.

C. Two additional elective graduate level courses (6 credits) in engineering or mathematical, physical or biological sciences. The student makes these selections with the documented approval of the department's Graduate Committee which has the authority to decide on acceptable courses.

D. 6 credits of MEEG 869 Master's Thesis.

II. Thesis Requirements A thesis is required which demonstrates the student's ability to conduct scholarly research. Entering graduate students are expected to choose a thesis advisor and research topic during their first semester in the Department so that they can initiate research and choose appropriate elective

courses.

At the completion of the thesis research, candidates for the MSME degree must defend their thesis orally to a committee of at least three faculty members. The committee will be chaired by the thesis advisor who, along with at least one other committee member, must be regular full-time faculty in the Department of Mechanical Engineering. The thesis is to be submitted to committee members at least two weeks in advance of the defense and shall meet the academic and professional standards set forth by the University. Upon acceptance of the thesis, the Committee recommends approval to the Department Chairperson.