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: ____Thomas S. Buchanan_____phone number__831-2423_____

Department: _____Mechanical Engineering_____email address buchanan @udel.edu_

Action: __**Revision of PhD (Doctor of Philosophy in Mechanical 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_____**07F**_____
(use format 04F, 05W)

Current degrees_____**Ph.D.**_____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: _____**Ph.D.**_____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name:_____**N/A**_____
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:_____**See Attached**_____
(**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.
Attached

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")
N/A

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

N/A

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

N/A

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

Program changes:

1) The Ph.D. program consists of the Ph.D. Qualifier Examination, 24 credits of graduate level course work plus 9 credits of Doctoral Dissertation. This signifies a reduction of 9 credits from the previously required 33 credits. Normally, the candidate will have a Masters degree from this or another institution and is well prepared to attempt the Ph.D. Qualifier without having to take remedial courses. – This is done to make the program uniform with respect to all entrees.

2) Individuals with a baccalaureate degree in Mechanical Engineering or a related field, may be offered admission to the Ph.D. program with the conditional requirement to complete 9 credits of courses from the list that are specified for MSME students in I.A above, in addition to the normal requirements for the degree. These courses are needed for preparation for the Ph.D. qualifier examination and cannot be counted towards the Ph.D. degree requirement. – This I done to allow those with a baccalaureate degree to go directly for the Ph.D. degree

3) The Qualifying Examination is based on a *template* of courses. This includes MEEG 690 Intermediate Mathematics; '*traditional'* mechanical engineering subjects (MEEG 610 Intermediate Solid Mechanics, MEEG 620 Intermediate Dynamics, MEEG 630 Intermediate Fluid Mechanics, and MEEG 640 Intermediate Heat Transfer); and *'non-traditional'* mechanical engineering subjects in particular areas of faculty expertise (biomedical engineering, nanomechanics, robotics, alternative energy, composite materials, etc.). – This is to reflect changes in modern engineering research and, subsequently, in faculty research interest.

4) In judging student performance at the Qualifying Examination, the faculty has three options: (i) outright passing, (ii) giving a second chance, and (iii) outright failing. Students who have been given a second chance for the QE are examined orally in the subjects in which their performance was judged unsatisfactory. There will be no third chance given. – We have found that granting just one chance of passing, Qualifier Examination became a significant obstacle even to some betters students.

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; in addition modified Program Policy Statement (indicating program changes and changes to the qualifying exam - to complement program changes) is also included.

1) OLD:

The Ph.D. program in Mechanical Engineering consists of 27 credit hours (for a post M.S. student) or 33 credits (for a post B.S. student) of graduate level course work plus 9 credits of Doctoral Dissertation.

1) NEW:

The Ph.D. program in Mechanical Engineering consists of the Ph.D. Qualifier Examination as specified in Section III below, 24 credits of graduate level course work plus 9 credits of Doctoral Dissertation.

Individuals admitted to the Ph.D. program may be offered admission with the conditional requirement to complete 9 credits of courses from the list that are specified for MSME students, in addition to the normal requirements for the degree. These courses are needed for preparation for the Ph.D. qualifier examination and cannot be counted towards the Ph.D. degree requirement.

2) OLD:

Course Requirements

A. At least four courses (12 credits) at the 600 or higher level in Mechanical Engineering (MEEG
B. At least three courses (9 credits) at the 800 level.
C. At least one course (3 credits) in mathematics (other than MEEG690).
D. 9 credits of MEEG 969 Doctoral Dissertation.

An individual course can be used to meet more than one of the requirements A, B or C provided the total number of credits is at least 27 (post M.S.) or 33 (post B.S.). MEEG868, and any course counted toward a Master's degree (for a post M.S. student) cannot be used toward these requirements. The Ph.D. qualifying exam is based on the materials in the courses MEEG 610, 620, 630, 640, and 690. As stated in Section III, students will write tests in three of the five subject areas corresponding to these five courses. The three corresponding MEEG6x0 courses cannot be counted towards the course requirements.

2) NEW:

Course Requirements

A. At least four courses (12 credits) at the 600 or higher level in Mechanical Engineering (MEEG
B. At least three courses (9 credits) at the 800 level.
C. At least one course (3 credits) in mathematics (other than MEEG690).
D. 9 credits of MEEG 969 Doctoral Dissertation.

An individual course can be used to meet more than one of the requirements A, B or C provided the total number of credits is at least 24. MEEG 868 cannot be used toward these requirements. The Ph.D. qualifying exam is based on a '*template*' that includes '*traditional*' mechanical engineering courses MEEG 610, 620, 630, 640, and 690 as well as '*non-traditional*' courses in particular areas of faculty expertise, as defined under Section III, Qualifying Examinations.

3) OLD:

Qualifying Examination

The student has one opportunity to take and pass this examination. A student who fails the Qualifying Examination is not eligible to continue in the Ph.D. program, but may apply to change his/her matriculation to the Master's program. This examination consist of separate written tests in three areas (each of three hours duration): Mathematics is a mandatory area; students may pick any two of the four remaining four areas of dynamics, fluid mechanics, heat transfer and solid mechanics. The qualifying examination will be based on the corresponding course material in MEEG 610, 620, 630, 640 and 690 and is intended to test the student for a broad based knowledge in the fundamental areas of Mechanical Engineering. Therefore, a student with a Master's degree in Mechanical Engineering should not need to take MEEG 610, 620, 630, 640, and 690 to prepare for the exam.

3) NEW:

Qualifying Examination

In judging student performance at this examination, the faculty has three options: (i) outright passing, (ii) giving a second chance, and (iii) outright failing. Students who have been given a second chance for the QE are examined orally in the subjects in which their performance was judged unsatisfactory. This shall be done in the September immediately following the QE. At least two faculty members, other than the student's advisor if already selected, must administer each oral examination. There will be no third chance given. A student who ultimately fails the Qualifying Examination is not eligible to continue in the Ph.D. program, but may apply to change his/her matriculation to the Master's program. The QE is based on a *template* that is flexible, yet assures uniformity of quality across examinations. The template is a set of courses not unlike the 'core courses' currently in effect, but in addition it mirrors the diversity of faculty research. It thus includes MEEG 690 Intermediate Mathematics; '*traditional*' mechanical engineering subjects (MEEG 610 Intermediate Solid Mechanics, MEEG 620 Intermediate Dynamics, MEEG 630 Intermediate Fluid Mechanics, and MEEG 640 Intermediate Heat Transfer); and '*non-traditional*' mechanical engineering subjects in particular areas of faculty expertise (biomedical engineering, nanomechanics, robotics, alternative energy, composite materials, etc.). This examination consists of separate written or oral exams in three areas: (1) Mathematics; (2) one *traditional* mechanical engineering subject (defined above); and (3) the *non-traditional* mechanical engineering subject of the student's choice, or a second *traditional* mechanical engineering subject.

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

Registrar Program Code Date

Vice Provost for Academic Programs & Planning Date

Provost Date

Board of Trustee Notification Date

Revised 5/02/06 /khs
First Change, for both of the existing Master's degrees, MSME and MEM: