

REQUEST TO COLLEGE CURRICULUM COMMITTEE FOR CURRICULAR IMPROVEMENTS

DEPARTMENT: MAE PROPOSED EFFECTIVE SEMESTER: Spring 2018 COLLEGE: CEAS

PROPOSED IMPROVEMENTS

Academic Program

- ☐ New degree*
☐ New major*
☐ New curriculum*
☐ New concentration*
☐ New certificate
☐ New minor
☐ Revised major
☐ Revised minor
☐ Admission requirements
☐ Graduation requirements
☐ Deletion ☐ Transfer
☐ Other (explain**)

Substantive Course Changes

- ☐ New course
☒ Pre or Co-requisites
☐ Deletion (required by others)
☐ Course #, different level
☐ Credit hours
☐ Enrollment restriction
☐ Course-level restriction
☐ Prefix ☐ Title and description
 (attach current & proposed)
☐ General education (select one)
 Not Applicable
☐ Other (explain**)

Misc. Course Changes

- ☐ Title
☐ Description (attach current & proposed)
☐ Deletion (not required by others)
☐ Course #, same level
☐ Variable credit
☐ Credit/no credit
☐ Cross-listing
☐ COGE reapproval
☐ Other (explain**)

** Other:

Title of degree, curriculum, major, minor, concentration, or certificate: BS in Mechanical Engineering

Existing course prefix and #: ME 5750 Proposed course prefix and #: Credit hours: 3

Existing course title: Tribology-Principles and Applications

Proposed course title:

Existing course prerequisite & co-requisite(s): ME 3560, ME 3650

Proposed course prerequisite(s) ME 3560 or AE 3610 or (consent of the instructor)

If there are multiple prerequisites, connect with "and" or "or". To remove prerequisites, enter "none."

Proposed course co-requisite(s)

If there are multiple corequisites, they are always joined by "and."

Proposed course prerequisite(s) that can also be taken concurrently:

Is there a minimum grade for the prerequisites or corequisites?

B

Major/minor or classification restrictions:

This course restricted to majors in aerospace or mechanical engineering. (AEGJ MEGJ)

For 5000 level prerequisites & corequisites: Do these apply to: (circle one) undergraduates graduates both

Specifications for University Schedule of Classes:

a. Course title (maximum of 30 spaces): Tribology-Principles and Applications

b. Multi-topic course: ☒ No ☐ Yesc. Repeatable for credit: ☒ No ☐ Yesd. Mandatory credit/no credit: ☒ No ☐ Yes

e. Type of class and contact hours per week (check type and indicate hours as appropriate)

1. ☒ Lecture 33. ☐ Lecture/lab/discussion5. ☐ Independent study2. ☐ Lab or discussion4. ☐ Seminar or ☐ studio6. ☐ Supervision or practicum

CIP Code (Registrar's use only):

Chair/Director K. Naghshie

Date 2/22/17

Chair, College Curriculum Committee

Date

Dean

Date:

Graduate Dean:

Date

Curriculum Manager: Return to dean ☐ Date

Forward to:

Date

Chair, COGE/ PEB / FS President

Date

FOR PROPOSALS REQUIRING GSC/USC REVIEW:

* ☐ Approve ☐ Disapprove

Chair, GSC/USC

Date

* ☐ Approve ☐ Disapprove

Provost

Date

1. Explain briefly and clearly the proposed improvement.

By removing one of the prerequisite courses i.e., ME 3650, more students can take this interdisciplinary course. This is an improvement because this course has lots of application in mechanical and aerospace industry.

2. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)

This course's focus is on hydrodynamic lubrication, friction, and wear in mechanical seals, journal, and thrust bearings. It does not require the knowledge of machine design and in general design concepts for understanding the tribological topics. However, fluid mechanics is the main subject that applies directly to the topics covered.

3. Effect on other colleges, departments or programs. If consultation with others is required, attach evidence of consultation and support. If objections have been raised, document the resolution. Demonstrate that the program you propose is not a duplication of an existing one.

N/A

4. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.

None. This course is an interdisciplinary course that fits well with thermal-fluid and solid mechanics courses in the two programs.

5. Effects on enrolled students: Are program conflicts avoided? Will your proposal make it easier or harder for students to meet graduation requirements? Can students complete the program in a reasonable time? Show that you have considered scheduling needs and demands on students' time. If a required course will be offered during summer only, provide a rationale.

This course is an elective course for undergraduate mechanical engineering students and graduate students in mechanical and aerospace engineering. This is not a required course and provides additional flexibility for both ME and AE programs to improve time to graduation.

6. Student or external market demand. What is your anticipated student audience? What evidence of student or market demand or need exists? What is the estimated enrollment? What other factors make your proposal beneficial to students?

It is estimated when this course is offered, there will be at least 15-20 students will be taking this course because it has a wide range of applicability in both mechanical, aerospace, chemical, and paper engineering programs.

7. Effects on resources. Explain how your proposal would affect department and University resources, including faculty, equipment, space, technology, and library holdings. Tell how you will staff additions to the program. If more advising will be needed, how will you provide for it? How often will course(s) be offered? What will be the initial one-time costs and the ongoing base-funding costs for the proposed program? (Attach additional pages, as necessary.)

There should be no effect on resources.

8. General education criteria. For a general education course, indicate how this course will meet the criteria for the area or proficiency. (See the General Education Policy for descriptions of each area and proficiency and the criteria. Attach additional pages as necessary. Attach a syllabus if (a) proposing a new course, (b) requesting certification for baccalaureate-level writing, or (c) requesting reapproval of an existing course.)

This course is not a general education course.

9. List the learning outcomes for the proposed course or the revised or proposed major, minor, or concentration. These are the outcomes that the department will use for future assessments of the course or program.

-An understanding of the principles of tribology that is oriented toward the needs of mechanical and aerospace engineering design.

-Enhance students' knowledge of the literature resources that relate to tribological behavior and phenomena.

-Enhance students' awareness of tribological issues with regards to machine components, such as seals, rolling element bearings, journal bearings, gears and braking systems

10. Describe how this curriculum change is a response to assessment outcomes that are part of a departmental or college assessment plan or informal assessment activities.

The senior survey responses show that both programs are short in practical applications of theory to engineering problems. This course provides the knowledge base for this deficiency. Students mostly use equations learned without the knowledge of its limitations in actual machine components. This course will provide a good understanding of how these elements work and the exact equations and limitations of the Reynolds equation for lubrication.

11. (Undergraduate proposals only) Describe, in detail, how this curriculum change affects transfer articulation for Michigan community colleges. For course changes, include detail on necessary changes to transfer articulation from Michigan community college courses. For new majors or minors, describe transfer guidelines to be developed with Michigan community colleges. For revisions to majors or minors, describe necessary revisions to Michigan community college guidelines. Department chairs should seek assistance from college advising directors or from the admissions office in completing this section.

This does not affect transfer articulation for Michigan community colleges since it is an upper level course.

Current Catalog

ME 5750 - Tribology-Principles and Applications

Surface chemistry, topographical measurement and description, contact mechanics, wear mechanisms, lubrication and film formation, hydrodynamic theory and application in bearings, application to friction and wear in machine elements.

Prerequisites/Corequisites: Prerequisites: ME 3560, 3650.

Credits: 3 hrs.

Notes: Open to Upperclass and Graduate Students.

Lecture Hours - Laboratory Hours: (3-0)

Proposed Catalog

ME 5750 - Tribology-Principles and Applications

Surface chemistry, topographical measurement and description, contact mechanics, wear mechanisms, lubrication and film formation, hydrodynamic theory and application in bearings, application to friction and wear in machine elements.

Prerequisites/Corequisites: Prerequisites: ME 3560 or AE 3610 or (consent of the instructor)

Credits: 3 hrs.

Notes: Open to Upperclass and Graduate Students.

Lecture Hours - Laboratory Hours: (3-0)