Please verify your data for New Curriculum Course Request for department: ME; college: A.
Go to the following URL to complete your worklist items: https://bwfp1.cc.wmich.edu:7102/wfbprod

Date of request: 03-OCT-2019


College: A
Department: ME
Initiator name: Peter Gustafson
Initiator email: peter.gustafson@wmich.edu
Proposed effective term: 202040
Does course need General Education approval?: Y
Will course be used in teacher education?: N
If 5000 level course, prerequisites apply to: U
Proposed course data:
WES New Course AE 4805
New course selected: This new course is seeking approval as WMU Essential Studies - Level 3: Connections

1. Proposed course prefix and number:
AE 4805

2. Proposed credit hours:
3

3. Proposed course title:
Aerospace Engineering Project/International

4. Proposed course prerequisites:
AE 4790 with a grade of “C” or better.

5. Proposed course corequisites:
None

6. Proposed course prerequisites that may be taken concurrently (before or at the same time):
None

7. Minimum grade for prerequisites (default grades are D for Undergrad and C for Grad):
8. Major and/or minor restrictions:
Include

9. List all the four-digit major and/or minor codes (from Banner) that are to be included or excluded:
AEGJ

10. Classification restrictions:
Include

11. List all the classifications (freshman, sophomore, junior, senior) that are to be included or excluded:
SR

12. Level restriction:
Include

13. List the level (undergraduate, graduate) that is to be included or excluded.
UG

14. Do prerequisites and corequisites for 5000-level courses apply to undergraduates, graduates, or both?
Not Applicable

15. Is this a multi-topic course?
No

16. Proposed course title to be entered in Banner:
Aero Engr Proj/International

17. Is this course repeatable for credit?
No

18. Is this course mandatory credit/no credit?
No

19. Select class type:
Lecture/Lab/Discussion

20. How many contact hours per week for this course?
1-6

21. Level 3: Connections:
Indicate which course category the course should be placed in:
Local and National Perspectives

22. Indicate which ONE additional required student learning outcome the course will assess:
Apply ethical, critical, and informed thought within and across disciplines

23. AND, Indicate which ONE additional required student learning outcome the course will assess:
Demonstrate effective and appropriate written communication abilities

24. How are you going to address this in your course?
This course is a senior design capstone course with a specific focus on real world problems with an international focus. The course will be team taught by the responsible faculty, a separate faculty adviser, and with input from an international partnership.

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
B. Please choose the applicable class level:
Undergraduate

C. Please respond Yes if this is a current general education course and/or a course being submitted for the new WMU Essential Studies program. Please respond No if it is neither.
Yes

D. Explain briefly and clearly the proposed improvement.
A modified version of the curriculum capstone project. An open-ended design project that includes also an international collaboration that is accomplished through remote communication with a team overseas. This is equivalent to ME 4805 but with an AE prefix.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.).
In the 21st Century most engineers work in collaboration with international companies. The added experience of working in remote international collaborative mode develops invaluable skills and makes them more marketable upon graduation. Learning to navigate cultural differences, time-zones and language barriers is a vital skill for the engineer, entering the workforce. In addition, a large percentage of the engineering workforce works today, at least partially, remotely. Remote communication is very different from face-to-face and requires training. After completing the ME 4805 class, students will be better prepared to work remotely also from home (‘telecommuting’).

F. List the student 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. In addition to the learning outcomes in ME/AE 4800, students in this course will be assessed for their ability to communicate remotely and their understanding of other cultures and their ethical codes.

G. Describe how this curriculum change is a response to student learning assessment outcomes that are part of a departmental or college assessment plan or informal assessment activities.
N/A. This change was developed based on a suggestion from our industrial advisory board.

H. 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

I. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.
N/A. Students will have the choice of taking the traditional capstone project (AE 4800) and this one.

J. 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.
N/A

K. 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?
This option will be open to a highly selective group of students. They will participate in the regular AE 4800 class, and be advised by their mentor, just like the AE 4800 students.

L. 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
Student will use the same AE 4800 lecture.

M. With the change from General Education to WMU Essential Studies, this question is no longer used.

For courses requesting approval as a WMU Essential Studies course, a syllabus identifying the student learning outcomes and an action plan for assessing the student learning outcomes must be attached in the Banner Workflow system.
Not Applicable

N. (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.
N/A (capstone project is not transferable)

O. Current catalog copy:
N/A

P. Proposed catalog copy:
An engineering experience in completing an open-ended design project including synthesis, analysis, evaluation, and presentation. An international collaboration is accomplished through remote communication with a team overseas. Classroom discussion subjects include legal, ethical, remote communication and professional aspects of engineering practice.

Department Curriculum Chair approver: Kapseong Ro

Department Curriculum Chair comment:
Date: 03-OCT-2019

Department approver: Koorosh Naghshineh

Chair comment:
Date: 04-OCT-2019
**COURSE OUTLINE AND GRADING POLICY**

**Course:** AE 4805 Mechanical Engineering Project/International

**Semester:** Fall & Spring

**Catalog Data:** AE 4805 Mechanical Engineering Project/International (Credit: 3 hr. (1-6))

**Description:** An engineering experience in completing an open-ended design project including synthesis, analysis, evaluation, and presentation. Classroom discussion subjects include legal, ethical, remote communication and professional aspects of engineering practice.

**Objectives:**
- To develop a solution to an open ended engineering design problem and to apply different methods of intellectual inquiry, investigation and discovery (WMU Essential Studies SLO)
- To prepare an oral presentation and a written report that presents a solution to the design problem and to demonstrate effective and appropriate written communication (WMU Essential Studies SLO)
- To prepare for professional practice by developing a communication channel with industrial mentors and by working effectively as a team.
- To develop an understanding of the legal, ethical and professional aspects of engineering practice and to apply ethical, critical, and informed thought within and across disciplines (WMU Essential Studies SLO)
- To develop the skills necessary for successful remote communications, learning to navigate cultural differences, time-zones, and language barriers.

**Class Hour:** Mondays; 11:30 to 12:20 PM


**Prerequisite:** AE 4790.

**Instructor:** Professor, Department of Mechanical and Aerospace Engineering,

**Office:** Parkview Campus

**Office Hours:** TBD

The aim of this course is to provide an engineering experience emphasizing an open ended project design concept. In AE 4790 your team defined the project and the work plan. This semester you will complete project related materials, gain further understanding of the ethical and social responsibilities of an engineer, complete the project, prepare a formal design report and present your work in a public forum.

Class meetings shall be used to discuss design report format, conference presentation skills and the professional conduct of engineering with an emphasis on engineering ethics.
Attendance in the weekly class meeting is mandatory.

Each week you will submit a progress report. One report is to be submitted by each group which will delineate the individual activities and goals of each member of the team.

Each group must meet with their faculty mentor weekly and communicate electronically with their international sponsor on a regular basis to discuss the project’s progress and challenges.

This course is approved as a writing-intensive course which may fulfill the baccalaureate-level writing requirement of the student’s curriculum.

This course satisfies the WMU Essential Studies Level -3 requirements as well.

**GRADING POLICY:**

The grade you receive will be determined by your faculty mentor (80%) and by the course instructor (20%)

The 20% of the grade from the course instructor will consist of:

- Reading/discussing ethics cases including correlating to your project 13%
- Weekly and review reports 2%
- Designing review and a half report and other assignments 5%

The 80% of the grade by the faculty mentor will consist of:

- Effectively identifying, formulating and solving engineering problems and designing a system, component or process to meet a need. (Individual/team) 50%
- Writing formal report that communicates ideas effectively with proper grammar, spelling and sentence structure (team). 10%
- Preparing excellent visuals, and effectively communicating orally in a professional setting 10%
- Effectively communicating remotely with the international partners 10%

**Grading Scale**

- A: Above 90.0 %
- BA: 85.0 -89.9 %
- B: 80.0 - 84.9 %
- CB: 75.0 - 79.9 %
- C: 70.0 - 74.9 %
- E: Below 70.0 %

**Important Notice:**

“Students are responsible for making themselves aware of and understanding the University policies and procedures that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. The academic policies addressing Student Rights and Responsibilities can be found in the Undergraduate Catalog at [http://catalog.wmich.edu/content.php?catoid=24&navoid=974](http://catalog.wmich.edu/content.php?catoid=24&navoid=974) and the Graduate Catalog at [http://catalog.wmich.edu/content.php?catoid=25&navoid=1030](http://catalog.wmich.edu/content.php?catoid=25&navoid=1030). If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s) and if you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.”
## Course Matrix

### AE 4805 Engineering Project/International

<table>
<thead>
<tr>
<th>Class/week No.</th>
<th>Topic Discussion</th>
<th>Design project assignments</th>
<th>Homework Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to the course</td>
<td>Prepare Brochure info for publication in SEDP Conference Brochure. Prepare Project review form</td>
<td>Meet with the mentor/s</td>
</tr>
<tr>
<td>2</td>
<td>Lecture 1- Ethics</td>
<td>Brochure info. due to the mentor Project Review Report #1 to instructor with the signatures of faculty mentor and industrial mentor (if applicable)</td>
<td>Progress report 1,</td>
</tr>
<tr>
<td>3</td>
<td>Ethics - Morale</td>
<td>Brochure info. back from the mentor signed and submit to the instructor</td>
<td>Progress report 2, Ethic case</td>
</tr>
<tr>
<td>4</td>
<td>Ethics - responsibility</td>
<td>Prepare table of contents of the design report</td>
<td>Progress report 3 Ethic case Individual Ethics report due</td>
</tr>
<tr>
<td>5</td>
<td>Risks</td>
<td>Finish CEAS info.</td>
<td>Progress report 4 Ethic case</td>
</tr>
<tr>
<td>6</td>
<td>Acceptable Risks</td>
<td>Evaluate design alternatives Brochure to printing 10/26</td>
<td>Progress report 5 Ethic case</td>
</tr>
<tr>
<td>7</td>
<td>Liability</td>
<td>Work on decision matrix</td>
<td>Progress report 6 Ethic case</td>
</tr>
<tr>
<td>8</td>
<td>Engineering and Environment</td>
<td>Work on ½ report Project Review Report #2 with signatures of faculty mentor and industrial mentor (if applicable) to instructor.</td>
<td>Progress report 7 Ethic case</td>
</tr>
<tr>
<td></td>
<td>Code and Standards</td>
<td>half report format</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Patent/Trade Marks</td>
<td>½ report due to mentor and instructor Brochure goes to mail.</td>
<td>Progress report 8 Ethic case</td>
</tr>
<tr>
<td>10</td>
<td>Job hunting/presentation skills</td>
<td>ABET Questions</td>
<td>Progress report 9</td>
</tr>
<tr>
<td>11</td>
<td>Loose end</td>
<td>Work on final report</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Loose end</td>
<td>Work on final report and presentation</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Loose end</td>
<td>Hard copy to Mentor and a Hard copy and a CD in pdf</td>
<td>Final report submission</td>
</tr>
</tbody>
</table>
Major course requirements:

1. Preparation of information for SEDP Brochure:
   Students are required to prepare the abstract and or summary of their project in about 100 words that will be included in the Senior Engineering Design Project Conference (SEDP) publication. Students will submit the first draft in the second week to the mentor and the final version will be submitted in the third week to the instructor.

2. Individual ethical reports:
   Each student is required to write a comprehensive critique on an ethical case, where he/she has to address the background of the case, discuss the fundamental principles and canons of engineering ethics involved and mention how the case was resolved. The student needs to provide his/her candid opinion about the adequateness of the resolution on the case. The individual ethic report is collected on the 4th week of the semester and will be return to students with feedback.

3. Group ethic reports and presentations:
   Each student team is required to choose an ethical case which is closely related to their senior design project. And they are required to write a comprehensive critique report and present and discuss the case to the class and answer the questions raised. The report should address the background, ethical fundamentals and canons involved in the case and discuss whether the resolutions are adequate or not in their opinion. They also need to show how the case is related to their senior design project.

4. Weekly reports:
   Each senior design team is required to submit a weekly report that outlines the whole week activities of each member and proposed activities for the following week in order to monitor the progress of the team. It also contents any problems or issues faced by the team on their project so that it can be addressed promptly. The format of the weekly report is provided.

5. Project review report:
   Two project design review reports are required to submit by each student team, one at the beginning of the semester in the 2nd week and another at the middle of the semester in the 8th week. This report should content the outcomes of the design review meeting with faculty and industrial mentors so that any discrepancies can be addressed in time and it is submitted to the instructor.

6. Half project report:
   A half report of the project is due to the faculty, industrial mentors and the instructor in the 9th week of the semester. The half report should content all materials so far done by the team including appendix, albeit it may not be the final version. The mentors will provide appropriate feedbacks on as necessary.

7. Final senior design project report:
Each senior design team is required to submit a comprehensive engineering technical design report on their project to the faculty mentor, the sponsoring company mentor and the course instructor at the end of the semester. This final technical engineering report is a culmination of engineering design, analysis, and simulations of a product or a process or a significant improvement of thereof. It contains all documentations of design calculations, simulations results, set of design specifications and drawings, and project aims, outcomes, recommendations and conclusions.

8. Senior design project presentation to public:

   The student group will also present their results at the Senior Engineering Design Project (SEDP) conference sponsored by the College of Engineering and Applied Sciences. The SEDP is open to the public, and is held at the WMU Elson S. Floyd Hall. The representatives of the company are invited to this public forum in which the project findings will be presented. The name of the sponsoring company will be included in promotional materials that are produced for the SEDP event upon a written consent from the sponsor.
## AE 4805 WMU Essential Studies Assessment
### Level III-Connections
#### Local and National Perspectives

<table>
<thead>
<tr>
<th>WMU Essential Studies Student Learning Outcome</th>
<th>Assignments and/or Learning Activities that meet the criteria within the rubric that is aligned with the SLO</th>
<th>When the SLO assessment will take place</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>X</strong> Apply ethical, critical, and informed thought within and across disciplines</td>
<td>Ethics of Engineering Practice- Individual report - focused on the ethical requirements for engineers with case study&lt;br&gt;Group ethic report and presentation- address application of fundamentals and cannons of ethics and discuss with the class during presentation.&lt;br&gt;Final Senior Design Project Report- a comprehensive engineering technical design report on critical information within and across disciplines.</td>
<td>Due on 4th week&lt;br&gt;On the day of ethics case presentation&lt;br&gt;Due on 14th week</td>
</tr>
</tbody>
</table>

### Choose One Student Learning Outcome From Below

<table>
<thead>
<tr>
<th>WMU Essential Studies Student Learning Outcome</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>X</strong> Apply different methods of intellectual inquiry, investigation and discovery</td>
<td>Final Senior Design Project Report- a comprehensive engineering technical design report on their project is a culmination of engineering design, analysis, and simulations of a product or a process or a significant improvement of thereof.</td>
<td>Project review report – week 2 and 8&lt;br&gt;½ report – week 9&lt;br&gt;Final project report – week 14</td>
</tr>
<tr>
<td>□ Work both independently and in collaboration with others to achieve goals</td>
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<tr>
<td>□ Develop sensitivity to diversity and inclusion</td>
<td></td>
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<tr>
<td>Develop practices for planetary sustainability</td>
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<td></td>
</tr>
</tbody>
</table>
Additionally, Select One Level I Student Learning Outcome From Below

<table>
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<tr>
<th>WMU Essential Studies Student Learning Outcome</th>
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<th>When the SLO assessment will take place</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Checkmark] Demonstrate effective and appropriate written communication</td>
<td>Final Senior Design Project Report-focused on the writing process with reviews and revisions</td>
<td>Assigned week 1 Progress Review Reports- week 2 and 8 Draft Outline – week 4 ½ Report-week 9 Final Report - week 14</td>
</tr>
<tr>
<td>![Box] Demonstrate effective and appropriate oral and digital communication</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
