WESTERN MICHIGAN UNIVERSITY
COLLEGE OF ENGINEERING AND APPLIED SCIENCES
CURRICULUM COMMITTEE

MEETING AGENDA
Friday, April 12, 2019 12:00 p.m. to 2:00 p.m.
C258, CEAS (Dean’s Conference Room)

ANNOUNCEMENTS

PROCEDURAL ITEMS
Acceptance of the agenda

ACTION/DISCUSSION ITEMS

Department of Chemical and Paper Engineering
CEAS-191-163 ChP Delete CHEG 4840 Course
CEAS-191-164 ChP Change CHEG and PAPR area of emphasis by removing CHEG 4840

Department of Computer Science
CEAS-191-165 CS Create a new course CS 6821
CEAS-191-166 CS Change prerequisite for CS 5750

Department of Mechanical and Aerospace Engineering
CEAS-191-167 MAE Change contact hours for AE 2610 from (3-0) to (2-1)
CEAS-191-168 MAE Change prerequisite for course ME 5730 from ME 3650 to ME 2500
CEAS-191-169 MAE Change prerequisite for Course ME 3580
CEAS-191-170 MAE Change contact hours for AE 3610 from (4-0) to (3-1)
CEAS-191-171 MAE Change prerequisite for course ME 4790
CEAS-191-172 MAE New Course AE 4790
CEAS-191-173 MAE Change of title for course ME 4800
CEAS-191-174 MAE New Course AE 4800
CEAS-191-175 MAE Change prerequisite for course ME 2500

Western Essential Studies Feedback Discussion

*Proposals can be reviewed at: https://wmich.edu/engineer/curriculum18-19
Department Contact Information:

Start Date: 02-APR-2019
College: A
Department: PAPR
Initiator name: Said Abubakr

Department email: said.abubakr@wmich.edu

Proposed effective term: 202010

Does course need General Education or WMU Essential Studies approval?

N

Will course be used in teacher education?

N

If 5000 level course, prerequisites apply to:

U

Letter Course CHEG 4848
Course Deletion selected, type: not required by others

1. Existing course prefix and number:
CHEG 4848

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
No

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.
No

D. Explain briefly and clearly the proposed improvement.
CHEG 4848 has not been offered for a while

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)
CHEG 4848 has not been offered for many years and a new course (CHEG 5200) to replace it has been approved.

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.
Not applicable

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.
No change

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.
No effects

I. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.
No effects

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.
No effects

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?
Not applicable
L. Impact on resources. Explain how your proposal would affect department and university resources, including faculty, equipment, space, technology, and library holdings. Tell how you will support 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.)

No effects

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.

No effects

O. Current catalog copy:

CHEG 4840 Process Control for Energy Management The use of instrument systems, digital computers and programmable logic controllers to control process and utility boilers and energy management systems. Design of control systems, principles of analog and digital systems, digital signal processing and architecture of programmable logic controllers. Prerequisite: CHEG 4830, a minimum grade of 'C' is required in CHEG prefixed prerequisites.

4 hours (4-0-0)

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Department Curriculum Chair approver: Said Alhakim
Date: 08-APR-2019
Comment:
Chair approver: Kecheng Li
Date: 08-APR-2019
Comment:

Curriculum Committee Approval

- Approve

- Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number:

Attachments

- Catalog copy
  Undergraduate Catalog Copy for CHEG 4840.docx (42 KB)
  02-Apr-2019 11:00:25 AM
  (Update) [Remove]

Attach File
NOTE: Changes to programs may require course changes, which must be processed electronically. Any questions should be directed to Associate Provost David Reinhold at 7-4564 or david.reinhold@wmich.edu

DEPARTMENT: CHP
COLLEGE: CEAS

PROPOSED EFFECTIVE FALL YEAR:

PROPOSED IMPROVEMENTS: Academic Program Proposed Improvements

☐ New degree*
☐ New major*
☐ New curriculum*
☐ New concentration*
☐ New certificate*
☐ Admission requirements
☐ Graduation requirements
☐ Deletion*  ☐ Revised major
☐ Revised minor
☐ Change in Title
☐ Transfer

☐ Other (explain**)

** Other:

Title of degree, curriculum, major, minor, concentration, or certificate: BS CHGJ and BS PPRJ

Chair, Department Curriculum Committee: [Signature]  Date 4/2/19

CHECKLIST FOR DEPARTMENT CHAIRS/DIRECTORS

☐ For new programs and other changes that have resource implications, the dean has been consulted.
☐ When appropriate, letters of support from department faculty are attached.
☐ When appropriate, letters of support from other departments in the same college are attached.
☐ When appropriate, letters of support from other college deans, whose programs/courses may be affected by the change, are attached.
☐ The proposal has been reviewed by HIGE for possible implications for international student enrollment.
☐ The proposal is consistent with the departmental assessment plan, and identifies measurable learning outcomes for assessment.
☐ Detailed resource plan is attached where appropriate.
☐ All questions attached have been completed and supporting documents are attached.
☐ The proposal is written and complete as outlined in the Faculty Senate guidelines and the curriculum change guides.

Chair/Director: [Signature]  Date 4/2/19

CHECKLIST FOR COLLEGE CURRICULUM COMMITTEE

☐ The academic quality of the proposal and the faculty involved has been reviewed.
☐ Detailed resource plan is attached where appropriate.
☐ Consistency between the proposal and the relevant catalog language has been confirmed.
☐ The proposal has been reviewed for effect on students transferring from Michigan community colleges. Detailed information on transfer articulation must be included with undergraduate proposals.
☐ Consistency between the proposal and the College and department assessment plans has been confirmed.
☐ Consistency between the proposal and the College and department strategic plans has been confirmed.
☐ All questions attached have been completed and supporting documents are attached.
☐ The proposal is written and complete as outlined in the Faculty Senate guidelines and the curriculum change guides.

Chair, College Curriculum Committee: [Signature]  Date

Revised Sept. 2018. All previous forms are obsolete and should not be used.
### CHECKLIST FOR COLLEGE DEANS

- For new programs and proposed program deletions, the provost has been consulted.
- For new programs, letter of support from University Libraries Dean indicating library resource requirements have been met.
- When appropriate, letters of support from other college faculty and/or chairs are attached.
- When appropriate, letters of support from other college deans, whose programs/courses may be affected by the change, are attached.
- The proposal has been reviewed for implications for accreditation, certification, or licensure.
- Detailed resource plan is attached where appropriate.
- All questions attached have been completed and supporting documents are attached.
- The proposal is written and complete as outlined in the Faculty Senate guidelines and the curriculum change guides.

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<tr>
<th>Dean:</th>
<th>Date</th>
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### FOR PROPOSALS REQUIRING REVIEW BY:

**GSC/USC; EPGC, GRADUATE COLLEGE, and/or FACULTY SENATE EXECUTIVE BOARD**

- Return to Dean
- Forward to: **Curriculum Manager:**
  - Date:
- **Approve** □ **Disapprove**
  - **Chair, GSC/USC:**
  - Date
- **Approve** □ **Disapprove**
  - **Chair, EPGC:**
  - Date
- **Approve** □ **Disapprove**
  - **Graduate College Dean:**
  - Date
- **Approve** □ **Disapprove**
  - **Faculty Senate President:**
  - Date

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<th>*needs review by</th>
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<tbody>
<tr>
<td><strong>Provost:</strong></td>
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<tr>
<td>Date</td>
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</tbody>
</table>

Revised Sept. 2018. All previous forms are obsolete and should not be used.
1. Explain briefly and clearly the proposed improvement:
   
   Delete deleted course (CHEG 4840) from program requirements: Chemical Engineering Energy Management Area of Emphasis and Paper Engineering Process Engineering Area of Emphasis as shown in the attached catalog copy

2. Rationale. Give your reason(s) for the proposed improvement.
   
   CHEG 4840 has not been offered for a long time

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.
   
   No Effects

4. Effect on your department’s programs. Show how the proposed change fits with other departmental offerings.
   
   No Effects

5. Alignment with college’s and department’s strategic plan, mission, and vision.
   
   Not Applicable

6. 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.
   
   No Effects

7. 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?
   
   Not applicable

8. Effects on resources. Explain how your proposal would affect department and University resources, including faculty, equipment, space, technology, and library holdings. If proposing a new program, include a letter and/or email of support from the university libraries affirming that the library resource issues have been reviewed. Tell how you will staff additions to the program. If more advising will be needed, how will you provide for it? What will be the initial one-time costs and the ongoing base-funding costs for the proposed program? (Attach additional pages, as necessary.)
   
   No effects

9. List the learning outcomes for the revised or proposed major, minor, or concentration. The department will use these outcomes for future assessments of the program.
   
   Not Applicable

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

    Not applicable

11. (Undergraduate proposals only) Describe in detail how this change affects transfer articulation for Michigan community colleges. 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.

    No effects

12. Please offer both “Current Catalog Language” and “Proposed Catalog Language” if there is to be a change in the catalog description for a given program. For the "current" language, please copy and paste relevant language
from the most current catalog and for the “proposed” language, please share the exact proposed new catalog language. As possible, bold or otherwise note the key changes in the new proposed catalog language.

Not Applicable
Chemical Engineering

Emphasis Areas

Emphasis in Energy Management (17 hours minimum)
Required Courses (3 credit hours)
CHEG 4440 - Energy Management Engineering  Credits: 3 hours
CHEG 4840 - Process Control for Energy Management  Credits: 4 hours

Elective Courses (choose 14 hours minimum)
CHEG 5200 - Renewable Energy and Energy Storage  Credits: 3 hours
CHEG 5250 - Sustainable Earth Resources Engineering  Credits: 3 hours
CHEG 5950 - Topics in Chemical Engineering  Credits: 1 to 3 hours
CHP 3100 - Work Experience/Co-op  Credits: 1 hour
ECE 2100 - Circuit Analysis  Credits: 4 hours
ECE 2110 - Machines and Electronic Circuits  Credits: 3 hours
EDMM 1420 - Engineering Graphics  Credits: 3 hours
ME 4320 - Thermodynamics II  Credits: 3 hours
ME 4330 - Environmental Systems Design in Buildings  Credits: 3 hours
ME 4390 - Design of Thermal Systems  Credits: 3 hours

Paper Engineering

Areas of Emphasis

Emphasis in Process Engineering (16 hours minimum)
Required Electives (4 hours)
PAPR 2420 - Coating  Credits: 4 hours

Elective Courses (choose 12 hours minimum):
CHEG 3200 - Chemical Engineering Thermodynamics  Credits: 3 hours
Preferred Elective
CHEG 4100 - Chemical Reaction Engineering  Credits: 3 hours
CHP 3100 - Work Experience/Co-op  Credits: 1 hour
ECE 2100 - Circuit Analysis  Credits: 4 hours
GPS 5100 - Printability Analysis  Credits: 3 hours
IEE 3100 - Engineering Economy  Credits: 3 hours
(Another course in IEE, MGMT, or COM can be substituted for IEE 3100 with approval of the advisor.)
CHEG 5200 - Renewable Energy and Energy Storage  Credits: 3 hours
CHEG 4840 - Process Control for Energy Management  Credits: 4 hours
STAT 5670 - Statistical Design and Analysis of Experiments  Credits: 3 hours
Preferred Elective
WMU - Internal Curriculum Form - New

- **Department Contact Information:**
  - Start Date: 05-APR-2019
  - College: A
  - Department: CS
  - Initiator name: Jason Johnson
  - Department email: jason.e.johnson@wmich.edu
  - Proposed effective term: 2020A

**Does course need General Education or WMU Essential Studies approval?**
- N

**Will course be used in teacher education?**
- N

**If 5000 level course, prerequisites apply to:**
- G
  - New Course CS 6821
  - New course selected: This new course is not seeking approval as a general education course.

1. Proposed course prefix and number: CS 6821
2. Proposed credit hours: 3
3. Proposed course title: Information Retrieval
4. Proposed course prerequisites: CS 3500
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): C
8. Major and/or minor restrictions: Not Applicable
9. List all the four-digit major and/or minor codes (from Banner) that are to be included or excluded: none
10. Classification restrictions: Not Applicable
11. List all the classifications (freshman, sophomore, junior, senior) that are to be included or excluded: none
12. Level restriction: Exclude
13. List the level (undergraduate, graduate) that is to be included or excluded. US
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: Information Retrieval
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?

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
No

B. Please choose the applicable class level:
Graduate

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.
No

D. Explain briefly and clearly the proposed improvement.
Information Retrieval (IR) has been delivered twice as a CS 6830 (CRN: 43745) course. This proposal aims at making IR a permanent course for graduate students.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.).
IR was well received by students during the two times it was delivered. There were 19 graduate students in the class when it was last offered in Fall 2018. The primary instructor received overall evaluation scores of 4.6 and 4.5 in the two runs, evidencing a consistently high degree of student satisfaction. IR is related to CS 5820 Artificial Intelligence (AI) and CS 5821 Machine Learning (ML) in a way that they form a mutually-reinforcing trio. For example, indexing and retrieval are fundamental IR techniques that have value in AI knowledge representation and reasoning; ML techniques, such as clustering, classification, and learning to rank all are very relevant to

Department Curriculum Chair approver: Jason Johnson
Date: 05-APR-2019

Chair approver:
Date: 05-APR-2019

Curriculum Committee Approval

☐ Approve ☐ Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number: CEA-191-165-CS

Attachments

Attach File
Course Syllabus
CS 6821 – Information Retrieval
College of Engineering and Applied Sciences
2020

Instructor Information
Instructor: Alvis Fong
Office: CEAS B-253
Telephone: 276-3110
E-mail: alvis.fong@wmich.edu
Office Hours: TR 1 – 2pm or by appointment

Course Identification
Course Number: CS 6821
Course Name: Information Retrieval
Course Location: Floyd Hall xxx
Class Times: TBD
Prerequisite: CS 3500

Course Description/Overview
This course presents an in-depth examination of the theoretical foundation and practical considerations in the design, development, implementation, and evaluation of tools for managing and accessing large collections of documents. There is an emphasis on the World Wide Web, which is the most visible use case of IR. Explicit references are made to meaningfully relate IR theory and practice with AI and ML. Students are exposed to the cutting-edge of IR research, illustrated with several use cases that they can relate to (e.g. news summarization).

Course Learning Objectives
After taking this course, students will be able to:

- Discuss and apply knowledge in a range of fundamental topics (e.g. basic IR architecture, interactive IR) and advanced topics (e.g. efficient/advanced IR architectures, real-time IR, event detection, summarization)
- Compare several retrieval models (vector space, probabilistic, language, etc.) and evaluation strategies (e.g. offline and online)
- Assess IR systems, e.g. web search engines
- Investigate and design IR systems
- Explain how IR is related to AI and ML through techniques such as clustering and classification
Course Resources

Course Website

- E-learning: https://elearning.wmich.edu

Text Books


Other Resources


Grading Scheme: follows standard university policy

Grading Policy

Mid-Term Exam 25%
Final Exam 25%
Homework (x3) 30%, equally distributed i.e. 10% each.
Project 20%

Collaboration/Plagiarism Rules

Programming assignments are to be done on an individual basis. Students are allowed to discuss algorithms and concepts but are not allowed to share code or obtain code from any other resource (e.g., the web).

Homework assignments and online homework quizzes may be done collaboratively.

University Policies

Academic regulations and procedures are governed by University policy. Academic dishonesty cases will be handled in accordance the University's policies.

If you have a disability that could affect your performance in this class or that requires an accommodation under the Americans with Disabilities Act, please see me as soon as possible so that we can make appropriate arrangements.

Academic Honesty: http://www.wmich.edu/conduct/academichonesty/index.html

Office of Institutional Equity: http://www.wmich.edu/equity
**Tentative Course Schedule**

<table>
<thead>
<tr>
<th>Class</th>
<th>Topic(s)</th>
<th>Homework</th>
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<tbody>
<tr>
<td>1</td>
<td>Course Introduction</td>
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<td>2</td>
<td>Architecture</td>
<td>HW1 Assigned</td>
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<td>3</td>
<td>Architecture</td>
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<td>4</td>
<td>Term weighting</td>
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<td>5</td>
<td>VS model</td>
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<tr>
<td>6</td>
<td>Evaluation</td>
<td>HW1 Due</td>
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<td>7</td>
<td>Evaluation</td>
<td>HW2 Assigned</td>
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<td>8</td>
<td>Boolean model</td>
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<td>9</td>
<td>Relevance feedback</td>
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<td>10</td>
<td>Interactive IR</td>
<td>HW2 Due</td>
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<td>11</td>
<td>Probabilistic models</td>
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<td>12</td>
<td>Language models</td>
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<td>13</td>
<td>Revision for Mid-term Exam</td>
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<td>14</td>
<td>Mid-term Exam</td>
<td>HW3 Due</td>
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<td>15</td>
<td>Classification</td>
<td>Project →</td>
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<td>16</td>
<td>Clustering</td>
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<td>17</td>
<td>Learning to rank</td>
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<td>Real-time IR</td>
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<td>25</td>
<td>Project</td>
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<td>26</td>
<td>Revision for Final Exam</td>
<td>Project Reports</td>
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<td>Due</td>
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<tr>
<td>27</td>
<td>Final Exam</td>
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</tbody>
</table>
Department Contact Information:

- **Start Date:** 08-APR-2019
- **College:** A
- **Department:** CS
- **Initiator name:** Jason Johnson
- **Department email:** jason.e.johnson@wmich.edu

Proposed effective term:

- **202010**

Does course need General Education or WMU Essential Studies approval?

- **N**

Will course be used in teacher education?

- **N**

If 5000 level course, prerequisites apply to:

- **B**
  - Change Course CS 5750
  - Specific Course Change type selected: Pre or Co-requisites

1. Existing course prefix and number:
   CS 5750

2. Existing course prerequisites:
   Prerequisites and Restrictions:
   (CIS 5710 Minimum Grade of D OR
    CS 5710 Minimum Grade of C) AND
   (CS 5710 Minimum Grade of D OR
    CS 5710 Minimum Grade of C)

3. Proposed course prerequisites:
   CS 3240 AND CS 3310

4. Existing course corequisites:
   No Corequisites exist for CS 5750 in term 202010.

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):
   C

8. Do prerequisites and corequisites for 5000-level courses apply to undergraduates, graduates, or both?
   Both

9. If this change applies to multiple courses, please list them below.
   Not Applicable

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
   No

B. Please choose the applicable class level:
   Both

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.
   No

D. Explain briefly and clearly the proposed improvement.
   Change the prerequisites for CS 5750.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.).
   CS 5750 had been used as part of the Information Security curriculum. The Information Security class is now a new class (CYCS 5750). CS 5750 will be for CS students moving forward, so this change reflects what CS students
will need as prerequisites to be successful in CS 2560, rather than for CYCS 5750.

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. Students will be able to:

1. Given a C# program or web application, analyze the code to find vulnerabilities.
2. Given a programming task, apply security principles to develop code.
3. Given an access control policy specification, use DTE, RBAC, and MLS to implement the policy.
4. Given a confidentiality policy, apply public key and symmetric encryption to implement the policy.

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

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. No effect on other colleges, departments, or programs. While this class had previously been used as part of the Information Security program, it has been replaced in that program with CYCS 5750.

I. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.
N/A

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.

<table>
<thead>
<tr>
<th>Department Curriculum Chair approver:</th>
<th>Jason Johnson</th>
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<tbody>
<tr>
<td>Date:</td>
<td>08-APR-2019</td>
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<td>Comment:</td>
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<tr>
<td>Chair approver:</td>
<td>Steve Carr</td>
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<tr>
<td>Date:</td>
<td>09-APR-2019</td>
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* Curriculum Committee Approval

- Approve
- Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:

- Proposal Number: CEA-191-166-CS

Attachments

Attach File
Department Contact Information:
- Start Date: 13-MAR-2019
- College: A
- Department: ME
- Initiator name: Peter Gustafson
- Proposed effective term: 2020-10
- Does course need General Education or WMU Essential Studies approval? Y
- Will course be used in teacher education? N
- If 5000 level course, prerequisites apply to:
  - U
  - Change Course AE 2610
  - Specific Course Change type selected: Credit hours

1. Existing course prefix and number: AE 2610
2. Existing credit hours: 0.00 OR 3.00
3. Proposed credit hours: 3.0
4. If this change applies to multiple courses, please list them below. Not Applicable
A. Please choose Yes or No to indicate if this class is a Teacher Education class: No
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. The credit distribution is to be changed from 3.0 lecture to 2.0 lecture and 1.0 lab.
E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.) The course has been taught with a lab component for many years. The credit hour change simply better reflects the structure of the course. Although this course is proposed for WES (subject of a different proposal), this change does not impact that proposal in a substantive way.
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. There are no changes to the learning outcomes.
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. This is not in response to assessment. This is to make the course more appropriately reflect the manner in which the course is being taught.
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. This should have no impact on other departments nor programs. This is the way the course has been taught for at least a decade.
I. Effect on your department’s programs. Show how the proposed change fits with other departmental offerings. This should have no impact on other department programs. This is the way
the course has been taught for at least a decade.

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. This should have no impact on students. This is the way the course has been taught for at least a decade.

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 should have no impact on market demand. This is the way the course has been taught for at least a decade.

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 necessary.) This should have no impact on resources relative to current operations. This is the way the course has been taught for at least a decade.

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.

Department Curriculum Chair approver: Kapeong Ro
Date: 13-MAR-2019
Comment:
Chair approver: Koorosh Naghshineh
Date: 13-MAR-2019
Comment:

This course was submitted as a WES course last fall. The changes proposed here do not affect the original WES proposal.

Curriculum Committee Approval

- Approve
- Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:

Proposal Number: CEAS 191 167 MAE ae 2610

Complete | Save & Close | Cancel

Attachments

1. Select this option if you are uploading a syllabus.
   AE2610 Fall 2020 Clean.pdf (90 KB)
   13-Mar-2019 11:17:29 AM
   Comments: Syllabus as proposed for WES.
   [Update] [Remove]

2. Select this option if you are uploading an assessment plan.
   AE2610 Fall 2020 Assessment.pdf (77 KB)
   13-Mar-2019 11:17:59 AM
   Comments: Assessment as proposed for WES (Separate Proposal).
   [Update] [Remove]
<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>
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<tbody>
<tr>
<td>Demonstrate effective and appropriate oral and digital communications</td>
<td>Labs 1, 2, 5, 6 provide learning experiences for informal and semi-formal digital communication. Materials covered in weekly laboratory sessions will include substantial discussion of the expected format and objectives of the communication media. Labs 4, 6, and DBF provide learning opportunities for formal technical digital communication.</td>
<td>Assessment will be completed of oral “elevator pitches”, submitted media article, and final DBF Technical Report.</td>
</tr>
<tr>
<td>Demonstrate and apply information literacy</td>
<td>Labs 2, 3, 4, 5 will provide students the opportunity to develop skill in digital literacy as they will be required to research historical and current methods of conducting the required laboratory experiments.</td>
<td>The media article written for Laboratory 5 and the DBF Technical Report will be used to assess the students’ abilities to apply digital literacy and cite relevant contextual technical and non-technical content.</td>
</tr>
</tbody>
</table>

Table 2: Western Essential Studies Oral and Digital Communications Assessment
Syllabus for AE2610
INTRODUCTION TO AEROSPACE ENGINEERING
Fall 2020
3 Credits: Required for BS Aerospace Engineering

Instructor: Assoc. Prof. Peter Gustafson
Office: G-215 Floyd Hall
Phone: 276-3423
Email: peter.gustafson@wmich.edu
Faculty Web Page: http://homepages.wmich.edu/~pjm8969/
Course Web Page: on e-learning

Schedule:
Lecture: MW 4:30–5:20, C-210 Floyd Hall
Office Hours: TR 1–2, or by appointment (See the faculty web page for potential slots)

Catalog Data:
An overview of aerospace engineering disciplines; the history of aerospace, fundamental elements of aerodynamics and astrodynamics, experiments, airfoils and wings, performance, stability and control, propulsion, and structures leading toward the aerospace vehicle conceptual design. Oral and digital communications are emphasized as methods of conveying technical information to diverse audiences.

Objectives
The objective of this course is to give students a broad conceptual understanding of major branches of aerospace engineering discipline leading to aerospace vehicle design.

- To apply mathematics and physics courses to the solution of introductory level problems in aerospace engineering.
- To introduce the principals of aeronautics for use in subsequent course in aerospace curriculum.
- To expose the student to the principals of aircraft design
- To motivate the engineering students to pursue education and subsequent professional career in aerospace engineering.
- To develop essential skills used in modern engineering communication. (WMU Essential Studies Learning Outcome)
- To develop information literacy. (WMU Essential Studies Learning Outcome)

Topics:
- History of Aviation
- Basic Aerodynamics
- Propulsion
- Airplane Performance
- Stability & Control
- Structures & Materials
- High-speed Flight
- Airplane Design (through DBF)
- Aerospace Testing (through Lab)

**Prerequisites:**

MATH 1220 and Phys 1060 concurrently

**Text:**


**Reference materials:**

- [http://history.nasa.gov/SP-367/cover367.htm](http://history.nasa.gov/SP-367/cover367.htm)

**Grading:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Midterm Exams</td>
<td>40% (20% each)</td>
</tr>
<tr>
<td>Final Exam (Comprehensive)</td>
<td>30%</td>
</tr>
<tr>
<td>8-10 HW Sets</td>
<td>15%</td>
</tr>
<tr>
<td>6 Lab Group Reports + DBF</td>
<td>15% (12% LAB@12% each + DBF 3%)</td>
</tr>
</tbody>
</table>

**Grading scale:**

- A: \( \geq 90\% \)
- A*: \( \geq 85\% \)
- B: \( \geq 80\% \)
- B*: \( \geq 75\% \)
- C: \( \geq 70\% \)
- C*: \( \geq 65\% \)
- D: \( \geq 60\% \)

**Laboratory Goal & Schedule**

- The laboratory section of this course is primarily designed for students to be exposed to various experimental techniques used in aerospace engineering.

Prof. Peter A. Gustafson

Updated: November 21, 2018
• A further goal of the laboratory work is to provide students the opportunity to develop technical communication skills. Students will practice electronic and oral communication in a variety of forms.

Laboratory Assistants

• Cameron Segard (Head)
• Heather Irish
• Thomas Kerber
• Scott Miller
Laboratory Groups and Rules

- Each registrar-scheduled lab section is divided into 2 groups. Each student will be in only one group.
- Group members are assigned by the instructor and cannot be changed without prior approval.
- Labs are a group activity, and thus your group members rely upon your participation and promptness. It is the student's responsibility to arrive at the appropriate time, based on the Lab Schedule. A sign-in sheet will be present at the beginning of the session and will be removed by the Lab Assistant as the lab session starts. No credit will be given for labs where you weren't signed in.
- There will not be any make-up labs; hence it is not advisable to miss a lab. If extraordinary circumstances prohibit your participation in a scheduled lab session, you must notify your lab instructor and Dr. Gustafson by the Wednesday prior to the scheduled session. At the sole discretion of Dr. Gustafson, you might be permitted to change groups (for that lab session only). Under no circumstances will you be permitted two such scheduling accommodations. No credit will be given for missed labs.
- Failure for the laboratory portion of the course will result in a failing grade for the course.

Oral Presentations, Laboratory Reports, and Other Written Communications

- Students will rotate laboratory session leadership for each set of laboratory experiments. Roles, objectives, procedures, and expected results will be briefed by the leader. Experimental results will be communicated subsequent to each laboratory session. The results will be presented in a number of forms in order to develop technical communication skills.
- Groups will prepare oral and written summaries of their findings. Written communications are to include abstracts, media articles, technical blogs, and technical lab reports. Oral communications are to include academic presentations, technical "elevator pitches", and post-experiment debriefs. The (simulated) intended audiences for these sessions will include the general (non-technical) public, technical supervisors (i.e., employers), technical subordinates (i.e., employees), potential customers, and the research/academic community. Students will provide critique and criticism of their colleagues' results and communications. This simulates an essential element of professionalism.
- Each communication must include detailed identification of the laboratory participants.
  - Lab Exercise Number and Title
  - Lab Group Letter
  - Names of individual member with his/her signature
- Lab Assistant Name
- Date of the lab performed

- Communication preparation and delivery should be shared across the group for each session. Each participating member must attest to their participation and to that of colleagues. A student who does not contribute equitably to the technical communication shall not receive credit for the laboratory work.

- Use appropriate citations for all communications. Some guidelines may be suggested at http://www.writing.engr.psu.edu/workbooks/laboratory.html

**Assignments deadlines are strict. Assignments are typically due at the beginning of class. All homework must be turned in via e-learning. Late work will be penalized 10% per day or portion of a day. (Examples: 5 minutes late penalized 10%, 24 hours +5 minutes late penalized 20%).**

**Working Together:** For homework assignments, students are encouraged to discuss conceptual solution methods with their colleagues. However written work must be done independently and must accurately represent the work of the individual student. **All exams and quizzes are to be completed independently.**

**Classroom Etiquette:** Laptop and cell phone use during lecture causes distraction in your fellow students and in the instructor. Please disable these and all similar devices.

**Illness:** **Attendance is important, however, the health and well-being of our community is more important. Do not come to class if you are ill or suspect illness. Contact the instructor to inform him of your circumstances and to coordinate assistance.**

**Re-grades:** Re-grade requests must be submitted in writing within 1 week of the return of any item. **The instructor reserves the right to re-grade the entire item.**

**Academic Integrity and Personal/Professional Conduct:** 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 ed u/content php catoid=24&navoid=974 and the Graduate Catalog at http://catalog wmich ed u/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.

Students and instructors are responsible for making themselves aware of and abiding by the “Western Michigan University Sexual and Gender-Based Harassment and Violence, In-
timate Partner Violence, and Stalking Policy and Procedures" related to prohibited sexual misconduct under Title IX, the Clery Act and the Violence Against Women Act (VAWA) and Campus Safe. Under this policy, responsible employees (including instructors) are required to report claims of sexual misconduct to the Title IX Coordinator or designee (located in the Office of Institutional Equity). Responsible employees are not confidential resources. For a complete list of resources and more information about the policy see http://www.wmich.edu/sexualmisconduct.

In addition, students are encouraged to access the Code of Conduct, as well as resources and general academic policies on such issues as diversity, religious observance, and student disabilities:

- Office of Student Conduct: www.wmich.edu/conduct
- Division of Student Affairs: www.wmich.edu/students/diversity
- University Relations Office: www.wmich.edu/registrar/calendars/interfaith
- Disability Services for Students: www.wmich.edu/disabilityservices
<table>
<thead>
<tr>
<th>Assignment</th>
<th>Objective</th>
<th>Communication Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab 1</td>
<td>To understand principles of airspeed measurement</td>
<td>Technical Abstract</td>
</tr>
<tr>
<td>Lab 2</td>
<td>To investigate the airfoil aerodynamic characteristics using a computational aerodynamic tool</td>
<td>Blog</td>
</tr>
<tr>
<td>Lab 3</td>
<td>To investigate the airfoil aerodynamic characteristics through wind tunnel experiments</td>
<td>Company Technical Briefing</td>
</tr>
<tr>
<td>Lab 4</td>
<td>This lab exercise is intended to give the students an opportunity to investigate the effect of Aspect Ratio (AR) on lift and drag for rectangular wings using computational aerodynamic software called Xfrr5</td>
<td>Conference Article</td>
</tr>
<tr>
<td>Lab 5</td>
<td>To familiarize with names and functions of major aircraft components. To familiarize with names and functions of cockpit control and flight instrument system</td>
<td>Media Article</td>
</tr>
<tr>
<td>Lab 6</td>
<td>This lab exercise is intended to provide the students with an opportunity to understand the concept of Bernoulli’s equation, flow speed, pressure, and wake survey through a flow over circular cylinder experiment using the Small Wind Tunnel.</td>
<td>Journal Article</td>
</tr>
<tr>
<td>Glider Design, Build &amp; Fly (DBF) Project</td>
<td>The goal of this project is to provide an opportunity to work as a team in the design, fabrication and construction of a glider aircraft.</td>
<td>Elevator Pitch, Whitepaper, Technical Report</td>
</tr>
</tbody>
</table>

Table 1: Laboratory Assignments
<table>
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Table 2: Western Essential Studies Oral and Digital Communications Assessment
Department Contact Information:

- Start Date: 24-MAR-2019
- College: A
- Department: ME
- Initiator name: Pnina Ari-Gur
- Department email: pnina.ari-gur@wmich.edu

Proposed effective term:
- 202010

Does course need General Education or WMU Essential Studies approval?
- N

Will course be used in teacher education?
- N

If 5000 level course, prerequisites apply to:
- B
  - Change Course ME 5730
  - Specific Course Change type selected: Pre or Co-requisites

1. Existing course prefix and number:
   ME 5730

2. Existing course prerequisites:
   Prerequisites and Restrictions:
   ME 3650 Minimum Grade of B

3. Proposed course prerequisites:
   ME 2560 or instructor consent

4. Existing course corequisites:
   No Corequisites exist for ME 5730 in term 202010.

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):
   B

8. Do prerequisites and corequisites for 5000-level courses apply to undergraduates, graduates, or both?
   Both

9. If this change applies to multiple courses, please list them below. Not Applicable.

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
   No

B. Please choose the applicable class level:
   Both

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.
   No

D. Explain briefly and clearly the proposed improvement.
   This change will enable students from curricula other than mechanical engineering (e.g. medical engineering or aerospace engineering) to take the course. It was determined that ME 3650 is not needed as a pre-requisite.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.).
   This change will enable students from curricula other than mechanical engineering (e.g. medical engineering or aerospace engineering) to take the course. It was determined that ME 3650 is not needed as a pre-requisite.

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. No effect.

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

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. The course will become available to students that have taken ME 2500 (or equivalent) from curricula that do not take ME 3500.

I. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.
None.

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. None.

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?
It is anticipated that there will be a small increase in the number of students. They can be accommodated within the existing course.

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

Department Curriculum Chair approver: Kapseong Ro
Date: 25-MAR-2019
Comment:
Chair approver: Koorosh Naghshineh
Date: 25-MAR-2019
Comment:

* Curriculum Committee Approval
  ○ Approve
  ○ Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
  Proposal Number: CEAS 191 168 MAE ME 537

Attachments

Attach File
Department Contact Information:

Start Date: 27-MAR-2019
College: A
Department: ME
Initiator name: Koorosh Naghsheh

Department email: koorosh.naghsheh@wmich.edu

Proposed effective term: 202110

Does course need General Education or WMU Essential Studies approval? N

Will course be used in teacher education? N

If 5000 level course, prerequisites apply to:

1. Existing course prefix and number:
ME 3580

2. Existing course prerequisites:
Prerequisites and Restrictions:
ME 2580 Minimum Grade of C AND
(CS 1822 Minimum Grade of C OR CS 1823 Minimum Grade of C OR CS 1860 Minimum Grade of C)

3. Proposed course prerequisites:
Prerequisites and Restrictions:
ME 2580 Minimum Grade of C AND
(CS 1822 Minimum Grade of C OR CS 1823 Minimum Grade of C OR CS 1860 Minimum Grade of C)

4. Existing course corequisites:
No Corequisites exist for ME 3580 in term 202110.

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):
C

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

9. If this change applies to multiple courses, please list them below.
Not Applicable

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
No

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.

D. Explain briefly and clearly the proposed improvement.
the CS department has indicated that CS1822 and CS1823 will be eliminated.
In a previous proposal (approved last fall), we deleted CS1822/CS1823 form
our curriculum and replaced them with CS1200. Also, we no longer require CS1060. This change will align the prerequisite list for ME2580 with the new requirements.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.). This change makes CS1200 a prerequisite for ME2580 and removes CS 1060 as a prerequisite (see D above).

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. Nothing changes with the learning outcomes of ME2580.

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. This is a response to deletion of CS1022/CS1023/CS1060 and replacing them with CS1200.

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.

None

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

None

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.

None

K. Student or external market demand. What is your anticipated student audience? What evidence of student or market demand or need exists? What is

Department Curriculum Chair approver: Kapsong Ro
Date: 27-MAR-2019
Comment: Looks fine to me
Chair approver: Koorosh Naghshineh
Date: 27-MAR-2019
Comment:

Curriculum Committee Approval

☐ Approve ☐ Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number: CEAS 191-169 MAE

Attachments

☐ 1. Select this option if you are uploading a syllabus.
   ME2580额度&but.docx (20 KB), 27-Mar-2019 03:03:55 PM
   Update: Removal.

Attach File
MEGANISM ANALYSIS

Lecture: Tuesdays and Thursdays, 1:30-4:00 PM in D115 CEAS (Call number: 22263)
References: Your ME2580, Dynamics textbook.
Prerequisites: ME 2580 and (CS 1022 or CS 1023 or CS 1200), with a grade of "C" or better
(*** You may be tested on the material covered in the Dynamics class ***)

Instructor: Dr. Koorosh Naghshineh (pronounced nag-she-neh)
Office: G226 CEAS
Email: koorosh.naghshineh@wrmich.edu
Office Phone: (269) 276-3431
Office Hours: Tuesdays and Thursdays before class - 12:30-1:20 PM (or by appointment)

HOMEWORK/QUIZZES:
A list of your homework assignments along with the required format is given. You are responsible keeping track of your assignment list. Homework will be collected for grading. Homework will also include computer projects. Late homework will NOT be accepted. Quizzes may be given at any time, with or without prior announcement. Each quiz may be worth 10 to 50 points, whereas homework is in general worth 10 points (except those noted in the homework assignment sheet). Missed homework/quizzes may NOT be made up. If you miss homework or a quiz for any verifiable reason beyond your control, that part of your grade will be transferred to the final exam. Homework solutions will NOT be posted. During each class session, time will be devoted to answering questions regarding homework.

PROJECT:
Students have to perform a group project (3-4 per group depending on the size of project). The purpose of this project is to learn to analyze and design a mechanism per requirements defined by the instructor. One week prior to the end of the term, each group will submit a summary of their work to the instructor in the form of a PowerPoint presentation that will be evaluated by the instructor and the rest of the class. Your project grade will be based on the quality of work as presented by your final presentation. Group member names must be submitted (and approved).

GRADE MAKEUP:
The course grade will be based on the homework assignments, quizzes, and tests as follows.

\{\text{Homework/Quiz} = 15\% + \text{Project} = 15\% + \text{Test I} = 15\% + \text{Test II} = 25\% + \text{Final} = 30\% \} = 100\% \\

All tests are cumulative. No makeup tests will be given. Test dates will be announced at least one week prior to the test date. You are allowed to bring a single equation sheet to a test. If you miss a test for verifiable reasons beyond your control, that part of your grade will be transferred to the final exam. If you miss the final exam for any reason other than a verifiable tragedy, a grade of zero will be given (to your final).

If you have a question about a grade received, you must bring it to the instructor’s attention before the class period following the time when your grade was received.

The use of a cell phone in the classroom (during lecture or exams) is not allowed.

GRADING SCALE:

\begin{align*}
90.0\% & \text{ - 100.0\%} = \text{A} & 85.0\% & \text{ - 90.0\%} = \text{BA} \\
80.0\% & \text{ - 85.0\%} = \text{B} & 75.0\% & \text{ - 80.0\%} = \text{CB} \\
70.0\% & \text{ - 75.0\%} = \text{C} & 65.0\% & \text{ - 70.0\%} = \text{DC} \\
60.0\% & \text{ - 65.0\%} = \text{D} & 0.0\% & \text{ - 60.0\%} = \text{E} \\
\end{align*}

Academic Integrity

You are responsible for making yourself aware of and understanding the policies and procedures in the [Undergraduate Catalog/Graduate Catalog] that pertain to academic integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. 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). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with me if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.
Kaoseong Ro
P. Proposed catalog copy: There is no change on the catalog.

Department Contact Information:
- Start Date: 21-MAR-2019
- College: CEAS
- Department: MAE
- Initiator name: Tianshu Liu
- Department email: tianshu.liu@wmich.edu
- Proposed effective term: 202040

Does course need General Education or WMU Essential Studies approval?
- N

Will course be used in teacher education?
- N

If 5000 level course, prerequisites apply to:
- N

Specific Course Change type selected: Credit/No Credit

1. Existing course prefix and number:
AE 3610

2. Is this course mandatory credit/no credit?
Yes

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
No

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.
No

D. Explain briefly and clearly the proposed improvement. The proposed improvement will clearly indicate that AE 3610 has 3 credit hours for lectures and 1 credit hour for labs.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.). The current curriculum does not explicitly indicate that AE 3610 is a lab-based course such that it is difficult for scheduling. This proposed improvement will clarify this problem.

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.
Outcome #1: A knowledge of aerodynamics
Outcome #2: An ability to apply knowledge of science

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. The change does not student learning assessment.

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. There is no effect on other colleges.

I. Effect on your department's programs. Show how the proposed change fits with other departmental offerings. There is no effect on the departmental programs.

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. There is no effect on enrolled students.
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? There is no effect on student or external market demand.

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 necessary.) There is no effect on resources.

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. There is no effect on transferred articulation.

O. Current catalog copy:
Catalog Data:
AE 3610 - Aerodynamics I
A study of incompressible aerodynamics of flight vehicles with emphasis on

Department Curriculum Chair approver: Kangsong Ro

Date: 27-MAR-2019

Comment:
Chair approver: Koorosh Naghshineh

Date: 27-MAR-2019

Comment:

* Curriculum Committee Approval

☐ Approve
☐ Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:

Proposal Number: CEAS-191-170

Complete Save & Close Cancel

Attachments

☑ 1. Select this option if you are uploading a syllabus.

Syllabus4AE361 2020.pdf (105 KB)
26-Mar-2019 04:44:40 PM
Update: Upload

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Top

Syllabus for AAE3610 Aerodynamics I
Fall 2020

Instructor: Professor Tianshu Liu
  Office: G-217 Floyd Hall, Phone: 276-3426, Email: tianshu.liu@wmich.edu

Schedule: Lecture: Friday 2:30-5:20 pm
  Labs: Thursday 8:30 am-5:30 pm

Catalog Data:
  AAE 3610 Aerodynamics I
  Credit: 4 hours
  A study of incompressible aerodynamics of flight vehicles with emphasis on
  combined application of theory and experiments for solving practical aerodynamic
  problems.

Prerequisite Courses:
  AAE 261,

Current Textbook:
  Anderson, J. D., Fundamentals of Aerodynamics (Sixth Edition), McGraw-Hill,

References:
  McCormick, B. W., Aerodynamics, Aeronautics, and Flight Mechanics, Wiley,
  1995.
  Barlow, J. B., Rae, W. H. and Pope, A., Low-Speed Wind Tunnel Testing (Third

Course Objectives:
  1. To understand the basic theory of incompressible aerodynamics;
  2. To understand the standard experimental methods for wind tunnel testing;
  3. To gain the preliminary knowledge of computational methods;
  4. To gain the ability of interpreting experimental and computational data.

Evaluation:
  Midterm Exams 1 and 2: 35%
  Final Exam: 30%
  Home Work & Labs: 35%

  Grading scale: A: >90%, BA: ≥ 85%, B: ≥ 80%, CB: ≥ 75%, C: ≥ 70%,
  DC: ≥ 65%, D: ≥ 60%

Topics:
  Local surface quantities: pressure, skin friction, and temperature;
  Integrated quantities: lift, drag, side force, pitch, roll and yaw moments;
Angle of attack, the center of pressure;
Dimensional analysis, Reynolds number, Mach number;
Flow similarity, wind tunnel testing, experimental techniques;
Continuity equation, momentum equation, energy equation;
Streamline, vorticity, circulation;
Euler equation, Bernoulli’s integral;
Potential flow, elemental solutions;
Non-lifting and lifting flows over a cylinder, Kutta-Joukowski theorem;
Airfoils, thin-airfoil theory;
Finite wing, Downwash, induced drag, lifting-line theory;
Viscous flow, boundary layer.

Lectures:
Lecture 1:
Introduction to aerodynamics and classification of aerodynamics; The most important local quantities on an aerodynamic surface: pressure, skin friction and temperature; The integrated forces and moments: lift, drag and side force, and pitch, roll and yaw moments; The non-dimensional coefficients of the local and integrated forces and moments such as the pressure coefficient, skin friction coefficient, lift coefficient, drag coefficient, and pitch moment coefficient. A historical remark on “Theory vs. Empiricism” in aerodynamics.

Lecture 2:
Further discussions on the lift, drag and pitch moment; Calculations of the lift, drag, and pitch moments from the pressure and skin friction distributions on an airfoil; Introducing the angle of attack and the center of pressure (aerodynamic center). Brief show of quantitative, global pressure visualizations using the molecule sensor (pressure sensitive paint).

Lecture 3:
Dimensional analysis (Buckingham Pi theorem); Non-dimensional numbers in aerodynamics: Reynolds number and Mach number; Types of flows; Flow similarity and wind tunnel testing; Various wind tunnels; Survey of experimental techniques for measurements of forces, moments, model attitude, and flow fields;

Lecture 4:
Vector algebra and calculus; Continuity equation and its application in low-speed wind tunnels;
Momentum equation and physical interpretation; Substantial derivative;

Lecture 5:
Application of the integral momentum equation in wake survey; Energy equation; Hierarchy of solutions in aerodynamics;

Lecture 6:
Streamline, vorticity, and circulation; Euler equation and Bernoulli’s integral; Applications of Bernoulli’s equation in low-speed tunnels; Potential flow and Laplace equation; Potential and stream function;

Lecture 7:
Elemental solutions (uniform flow, source/sink flow and doublet flow) and combination of these solutions;
Potential flow around a non-lifting cylinder; the pressure distribution on a cylinder and comparison with experimental data;

Lecture 8:
Lifting-flow over a cylinder;
Kutta-Joukowski theorem; Magnus effect; d’Alembert paradox; Implication on the design of airfoils using the Joukowsky transformation;

Lecture 9:
Introduction to airfoils; Nomenclature of the airfoil geometry; Airfoil characteristics; Avian airfoils, NACA airfoils and low-speed airfoils;
Vortex sheet as an idealized model of an airfoil; Kutta condition, Kelvin’s circulation theorem; Symmetric thin airfoil theory;

Lecture 10:
Cambered thin airfoil theory; Numerical method for arbitrary body; practical airfoils; High-lift configurations (flap and slat);

Lecture 11:
Finite wing; Downwash and induced drag; Biot-Savart theorem;
Prandtl’s lifting line theory; Elliptical lift distribution; Aspect ratio effect; Physical significance;

Lecture 12:
Lifting surface theory: vortex lattice method; Survey of various wings; Wing and body integration;

Lecture 13:
Viscous flows and skin friction drag; Boundary layer; Skin friction in a flat-plate laminar boundary layer;
Transition and turbulence; Skin friction in a flat-plate turbulent boundary layer;

Laboratory Projects:
Lab 1:
Introduction to Applied Aerodynamics Laboratory at WMU. Discussions on static pressure measurements using taps with a U-tube and velocity measurements using a Pitot tube.

Lab 2:
Smoke flow visualizations of flows over airfoil and other objects.

Lab 3:
Velocity calibration experiments using a Pitot tube in the small tunnel in AAL and determination of the velocity data obtained from an inclined tube manometer and the output from a pressure transducer.

Lab 4:
Surface pressure measurement of a circular cylinder and drag estimation.

Lab 5:
Measurements of the force and moment coefficients of a NACA airfoil in a small wind tunnel using a calibrated balance;

Lab 6:
Measurement of the drag of a cylinder based on wake survey;

**Lab 7:**
Computational experiments using a CFD code “X-FOIL”: 
Worklist

WMU - Internal Curriculum Form - New

- 
- Department Contact Information:
  - Start Date: 26-MAR-2019
  - College: A
  - Department: ME
  - Initiator name: Judah Ari-Gur
  - Department email: Judah.ari-gur@wmich.edu
- Proposed effective term: 202010
- Does course need General Education or WMU Essential Studies approval? N
- Will course be used in teacher education? N
- If 5000 level course, prerequisites apply to:
  - U
    Change Course ME 4790
    Specific Course Change type selected: Title
    Specific Course Change type selected: Pre or Co-requisites

1. Existing course prefix and number:
   ME 4790

2. Proposed course title:
   Mechanical Engineering Project Planning

3. Existing course prerequisites:
   Prerequisites and Restrictions:
   (ME 3350 Minimum Grade of C OR ME 335 Minimum Grade of C) AND
   (ME 3600 Minimum Grade of C OR ME 360 Minimum Grade of C) AND
   (ME 4330 Minimum Grade of C with concurrency OR ME 433 Minimum Grade of C OR ME 4390 Minimum Grade of C with concurrency OR ME 439 Minimum Grade of C OR ME 4680 Minimum Grade of C with concurrency OR ME 468 Minimum Grade of C OR ME 5300 Minimum Grade of C with concurrency OR ME 530 Minimum Grade of C OR ME 4530 Minimum Grade of C with concurrency OR ME 453 Minimum Grade of C OR ME 4700 Minimum Grade of C with concurrency OR ME 470 Minimum Grade of C OR ME 470 Minimum Grade of C with concurrency OR ME 470 Minimum Grade of C OR ME 5730 Minimum Grade of C with concurrency OR ME 573 Minimum Grade of C OR AE 4600 Minimum Grade of C with concurrency OR AAE 4600 Minimum Grade of C OR AAE 460 Minimum Grade of C OR ME 4810 Minimum Grade of C with concurrency OR ME 481 Minimum Grade of C OR ME 5500 Minimum Grade of C with concurrency OR ME 550 Minimum Grade of C OR ME 450 Minimum Grade of C OR ME 5530 Minimum Grade of C with concurrency OR ME 553 Minimum Grade of C)

4. Proposed course prerequisites:
   ME 3350 and ME 3600 and ME 3650 and ME 4310

5. Existing course corequisites:
   No Corequisites exist for ME 4790 in term 202010.

6. Proposed course corequisites:
   None

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

8. Minimum grade for prerequisites (default grades are D for Undergrad and C for Grad): 

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

10. Existing Banner course title: 
    Mech/Aerospace Proj Planning

11. Proposed course title to be entered in Banner: 
    Mech Proj Planning

A. Please choose Yes or No to indicate if this class is a Teacher Education class: 
   No

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. 
   No

D. Explain briefly and clearly the proposed improvement. 
   The current course is serving 2 programs: mechanical engineering and aerospace engineering. The new course will serve only mechanical engineering students. The current course has a long list of prerequisites with many options, to allow for students of both programs to qualify. The new course will have a short list of prerequisites as needed for the mechanical engineering program.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.). 
   The current course serves students in the mechanical engineering and aerospace engineering programs. Now, in a separate document, the aerospace engineering program is proposing to have a separate project planning course, suited for the needs and interests of that program. This course will then serve only the mechanical engineering program. The title change is proposed

Department Curriculum Chair approver: Kapseong Ro 
Date: 26-MAR-2019
Comment:
Chair approver: 
Koorosh Naghshineh 
Date: 29-MAR-2019 
Comment:

* Curriculum Committee Approval

☐ Approve
☐ Deny
Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number: CEAS-191-171-MAE
Complete | Save & Close | Cancel

Attachments
Attach File
WMU - Internal Curriculum Form - New

Department Contact Information:
- Start Date: 26-MAR-2019
- College: A
- Department: ME
- Initiator name: Kapseong Ro

Department email: kapseong.ro@wmich.edu

Proposed effective term: 202010

Does course need General Education or WMU Essential Studies approval? N

Will course be used in teacher education? N

If 5000 level course, prerequisites apply to:
- U

New Course AE 4790
New course selected: This new course is not seeking approval as a general education course.

1. Proposed course prefix and number:
   AE 4790

2. Proposed credit hours:
   1

3. Proposed course title:
   Aerospace Engineering Project Planning

4. Proposed course prerequisites:
   ME 3350 and ME 3600 and AE 3710 and AE 3800

5. Proposed course corequisites:
   AE 4600

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):
   C

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:
   ASP

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?
    UG

15. Is this a multi-topic course?
    No

16. Proposed course title to be entered in Banner:
   Aerospace Eng Project Planning

17. Is this course repeatable for credit?
18. Is this course mandatory credit/no credit? 
No

19. Select class type:
Lecture

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

A. Please choose Yes or No to indicate if this class is a Teacher Education class: 
No

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. 
No

D. Explain briefly and clearly the proposed improvement. 
Creating a new course 'AE 4790 Aerospace Engineering Project Planning', which is a senior capstone design Planning course only for Aerospace Engineering Students.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.). 
Currently, AE Undergraduate Students are taking a senior capstone design planning course under 'ME 4790 Mechanical & Aerospace Engineering Project'. Due to differences in the prerequisite courses and sequences between ME and AE Program, the current catalog states a long list of prerequisite courses to take both programs into account. With drastic increase in AE Program enrollments and difficulties in advising individual students case by case, AE and ME Undergraduate Curriculum Committee discussed and agreed to divide the capstone design planning course in to 'ME 4790 Mechanical Engineering Project Planning' for ME students and 'AE 4790 Aerospace Engineering Project Planning' for AE students.

Department Curriculum Chair approver: Kang Seong Ro
Date: 26-MAR-2019
Comment: 
Chair approver: Koorosh Naghshineh
Date: 29-MAR-2019
Comment:

* Curriculum Committee Approval

☐ Approve  ☐ Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number: CEAS-191-172

Attachments

☐ 1. Select this option if you are uploading a syllabus.
AE4790 Course Syllabus.docx (19 KB)
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Course: **AE 4790 Aerospace Engineering Project Planning**

Semester: **Spring 2020**

Catalog Data: AE 4790 Aerospace Engineering Project Planning (Credit: 1-0)

Description: An introduction to design process, including problem definition, decision making and project planning. The goal of the course is to develop a project proposal and work plan for a major design project.

Objective:
- To locate and understand an open ended engineering design problem
- To develop a plan for a solution to the design problem
- To develop an understanding of the theory of engineering design

Class Hour: TBD

Class Room: TBD


Prerequisite: ME 3350 and ME 3600 and AE 3710 and AE 3800

Instructor: Dr. Bade Shrestha, P. Eng.
Professor
Department of Mechanical and Aerospace Engineering,
Ph: 269-276 3432
Email: Bade.Shrestha@wmich.edu

Office: Room G 223, Floyd Hall

Office Hours: TBD

The aim of this course is to develop a senior design project proposal and work plan. At the end of this semester, each group has a project defined that will be completed by the end of the fall semester 2019. The techniques for defining and planning engineering projects will be discussed in the class and used in preparing the project plan. The process of finding a project and a faculty mentor is the responsibility of you and your teammates although the departmental faculty will provide assistance and a limited number of projects.

Each week you will submit a fifty word progress report at the beginning of each class period which discusses your progress toward finding a project, your work plan for the subsequent period and your progress in writing the proposal. The progress report that you turn in must be of a week work. Each entry must be dated.

Once the team is constituted and a project selected, one progress report per team shall be submitted. At this time you shall be assigned a project number and must be included along with the project title on all materials submitted for a grade. The single progress report will contain all names of the team members and will discuss each member’s progress and each member’s subsequent plans as outlined above.

You are strongly advised to register with the National Society of Professional Engineers (NSPE) for the
fundamentals examination (FE). The score of FE exam will be used in ABET evaluation of the program.

In case of your proposal is unsatisfactory to either your faculty mentor, or the course instructor, for reasons beyond your control, you may be assigned an incomplete. A satisfactory proposal must be submitted to both your faculty mentor and the course instructor before the end of drops and adds in the semester in which you plan to enroll in ME 4800. You will not be able to enroll in ME 4800 until a satisfactory proposal is submitted.

**GRADING POLICY:**

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>Grade Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Above 90.0%</td>
<td>Written Assignment/Resume: 15%</td>
</tr>
<tr>
<td>BA: 85.0-89.9%</td>
<td>Weekly Progress Reports: 15%</td>
</tr>
<tr>
<td>B: 80.0-84.9%</td>
<td>Project Proposal: 50%</td>
</tr>
<tr>
<td>CB: 75.0-79.9%</td>
<td>Final Oral presentation: 20%</td>
</tr>
<tr>
<td>C: 70.0-74.9%</td>
<td>Total: 100%</td>
</tr>
<tr>
<td>E: Below 70.0%</td>
<td></td>
</tr>
</tbody>
</table>

**Important Notice:**

"You are responsible for making yourself 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.gwmich.edu/content.php?catoid=22&navoid=882](http://catalog.gwmich.edu/content.php?catoid=22&navoid=882) and the Graduate Catalog at [http://catalog.gwmich.edu/content.php?catoid=23&navoid=938](http://catalog.gwmich.edu/content.php?catoid=23&navoid=938).) 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."
- 
- Department Contact Information: 
  - Start Date: 25-MAR-2019 
  - College: A 
  - Department: ME 
- Initiator name: Kapseong Ro 
- Department email: kapseong.ro@wmich.edu 
- Proposed effective term: 202110 
- Does course need General Education or WMU Essential Studies approval? N 
- Will course be used in teacher education? N 

If 5000 level course, prerequisites apply to: YES 

WES New Course AE 4800 
New course selected: This new course is seeking approval as WMU Essential Studies - Level 3: Connections 

1. Proposed course prefix and number: AE 4800 
2. Proposed credit hours: 3 
3. Proposed course title: Aerospace Engineering Project 
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): C 
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: ASP 
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: Aerospace Engineering Project 
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?
   7

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?
   See the Course Syllabus and Assessment Plan

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
   No

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.
   No

D. Explain briefly and clearly the proposed improvement.

Department: Curriculum Chair approver: Kapsaang Ro
Date: 27-MAR-2019
Comment:

Chair approver: Kerorsh Naghshineh
Date: 29-MAR-2019
Comment:

* Curriculum Committee Approval

☐ Approve
☐ Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number: CEAS-191-173

Attachments

☐ 1. Select this option if you are uploading a syllabus.
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☐ 2. Select this option if you are uploading an assessment plan.
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   25-Mar-2019 13:26:14 PM
   (Undelete, Remove)

Attach File
Koorosh Naghshineh

Please revise to include WES requirements.

Department Contact Information:

- Start Date: 25-MAR-2019
- College: A
- Department: ME
- Initiator name: Kapseong Ro

- Department email: kapseong.ro@wmich.edu

Proposed effective term: 2021-10

Does course need General Education or WMU Essential Studies approval?

- N

Will course be used in teacher education?

- N

If 5000 level course, prerequisites apply to:

- Y

WES New Course AE 4800
New course selected: This new course is seeking approval as WMU Essential Studies - Level 3: Connections

1. Proposed course prefix and number: AE 4800
2. Proposed credit hours: 3
3. Proposed course title: Aerospace Engineering Project
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): C
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: ASPJ
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: Aerospace Engineering Project
17. Is this course repeatable for credit?
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?
   ?

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?
   See the Course Syllabus and Assessment Plan

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
   No

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.
   No

D. Explain briefly and clearly the proposed improvement.

Department Curriculum Chair approver: Kapsang Ro
Date: 27-MAR-2019
Comment:
Chair approver: Koorosh Naghshineh
Date: 29-MAR-2019
Comment:

*Curriculum Committee Approval*

- Approve
- Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number: CEAS-191-173

Attachments

1. Select this option if you are uploading a syllabus.
   AF4800 WES Syllabus FIT-01.docx (27 KB)
   25-Mar-2019 03:25:45 PM
   [Update / Remove]

2. Select this option if you are uploading an assessment plan.
   AF4800 WES Assessment FIT-01.docx (12 KB)
   25-Mar-2019 03:26:14 PM
   [Update / Remove]
## AE 4800 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>
</table>
| **X** Apply ethical, critical, and informed thought within and across disciplines | **Ethics of Engineering Practice** - Individual report - focused on the ethical requirements for engineers with case study  
Group ethic report and presentation - address application of fundamentals and cannons of ethics and discuss with the class during presentation.  
Final Senior Design Project Report - a comprehensive engineering technical design report on critical information within and across disciplines. | Due on 4th week  
On the day of ethics case presentation  
Due on 14th week |

**Choose One Student Learning Outcome From Below**

<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>
</table>
| **X** Apply different methods of intellectual inquiry, investigation and discovery | 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. | Project review report – week 2 and 8  
½ report – week 9  
Final project report – week 14 |

- Work both independently and in collaboration with others to achieve goals
- Develop sensitivity to diversity and inclusion
- Develop practices for planetary sustainability
<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> 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>□ Demonstrate effective and appropriate oral and digital communication</td>
<td></td>
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</tr>
</tbody>
</table>
COURSE OUTLINE AND GRADING POLICY

Course: AE 4800 Aerospace Engineering Project

Semester: Fall 2019

Catalog Data: AE 4800 Aerospace Engineering Project (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 and professional aspects of engineering practice. This course meets the student learning outcomes in the WMU Essential Studies Level 3 - Connections, Local and National Perspectives Course Category.

Objective:

- 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)

Class Hour: TBD

Class Room: TBD


Prerequisite: AE 4790

Instructor: Dr. Bade Shrestha, Professor, P. Eng.
Department of Mechanical and Aerospace Engineering,
Ph: 269-276 3432
Email: Bade.Shrestha@wmich.edu

Office: Room G 223, Parkview Campus
**Office Hours:** Mondays; 12:30 – 1:30 PM  
Tuesdays; 2:30 – 3:30 PM

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.

It is recommended that each group meet with their faculty mentor weekly and with their industrial mentor 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). 15%
- Preparing excellent visuals, and effectively communicating orally in a professional setting 15%

**Grading Scale**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Above 90.0 %</td>
</tr>
<tr>
<td>BA</td>
<td>85.0 - 89.9 %</td>
</tr>
<tr>
<td>B</td>
<td>80.0 - 84.9 %</td>
</tr>
</tbody>
</table>
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 and the Graduate Catalog at 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 4800 Aerospace Engineering Project**  
**Fall 2019**  
**Instructor: TBD**  
**Room: TBD**

<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>
</tbody>
</table>
| 2              | Lecture 1- Ethics                          | **Brochure info. due to the mentor**  
**Project Review Report #1 to instructor with the signatures of faculty mentor and industrial mentor (if applicable)** | Progress report 1, Ethic case               |
| 3              | Ethics - Morale                            | **Brochure info. back from the mentor signed and submit to the instructor**                 | Progress report 2, Ethic case               |
| 4              | Ethics - responsibility                    | Prepare table of contents of the design report                                             | Progress report 3 Ethic case Individual Ethics report due |
| 5              | Risks                                      | **Finish CEAS info.**                                                                      | Progress report 4 Ethic case                |
| 6              | Acceptable Risks                           | Evaluate design alternatives  
**Brochure to printing 10/26**                                                           | Progress report 5 Ethic case                |
| 7              | Liability                                  | Work on decision matrix                                                                    | Progress report 6 Ethic case                |
| 8              | Engineering and Environment Code and Standards Half report format | Work on ½ report  
**Project Review Report #2 with signatures of faculty mentor and industrial mentor (if applicable) to instructor.** | Progress report 7 Ethic case                |
| 9              | Patent/Trade Marks                         | **½ report due to mentor and instructor**  
**Brochure goes to mail.**                                                                | Progress report 8 Ethic case                |
<p>| 10             | Job hunting/presentation skills            | <strong>ABET Questions</strong>                                                                        | Progress report 9                           |
| 11             | Loose end                                  | Work on final report                                                                       |                                             |</p>
<table>
<thead>
<tr>
<th></th>
<th>Loose end</th>
<th>Work on final report and presentation</th>
<th>Final report submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td></td>
<td><strong>Hard copy to Mentor and a Hard copy and a CD in pdf format to instructor</strong></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Loose end</td>
<td>Final report submission</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td><strong>Conference of SEDP</strong></td>
<td>Final report submission</td>
<td></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 contains 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 contain 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 contain 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.
Department Contact Information:
- Start Date: 03-Apr-2019
- College: A
- Department: ME
- Initiator name: Pnina Ari-Gur
- Department email: pnina.ari-gur@wmich.edu

Proposed effective term: 2020-10

Does course need General Education or WMU Essential Studies approval? N

Will course be used in teacher education? N

If 5000 level course, prerequisites apply to:
- U
  - Change Course ME 2500
  - Specific Course Change type selected: Pre or Co-requisites

1. Existing course prefix and number:
   ME 2500

2. Existing course prerequisites:
   Prerequisites and Restrictions:
   (CHEM 1100 Minimum Grade of C OR
   CHEM 110 Minimum Grade of C) AND
   (CHEM 1110 Minimum Grade of C OR
   CHEM 111 Minimum Grade of C) AND
   (MATH 1220 Minimum Grade of C OR
   MATH 122 Minimum Grade of C OR
   MATH 1700 Minimum Grade of C) AND
   (ME 2615 Minimum Grade of C OR
   ME 2200 Minimum Grade of C OR
   ME 220 Minimum Grade of C OR
   IME 1500 Minimum Grade of C OR
   IME 150 Minimum Grade of C OR
   EDMM 1500 Minimum Grade of C)

3. Proposed course prerequisites:
   Prerequisites and Restrictions:
   (CHEM 1100 Minimum Grade of C OR
   CHEM 110 Minimum Grade of C) AND
   (CHEM 1110 Minimum Grade of C OR
   Prerequisites and Restrictions:
   (CHEM 1100 Minimum Grade of C OR
   CHEM 110 Minimum Grade of C) AND
   (CHEM 1110 Minimum Grade of C OR
   CHEM 111 Minimum Grade of C) AND
   (MATH 1220 Minimum Grade of C OR
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   MATH 1700 Minimum Grade of C) AND
   (ME 2615 Minimum Grade of C OR
   IME 1500 Minimum Grade of C OR
   IME 150 Minimum Grade of C OR
   EDMM 1500 Minimum Grade of C)

4. Existing course corequisites:
   No Corequisites exist for ME 2500 in term 2020-10.

5. Proposed course corequisites:
   No Corequisites exist for ME 2500 in term 2020-10.

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):
   C

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

9. If this change applies to multiple courses, please list them below.
Not Applicable

A. Please choose Yes or No to indicate if this class is a Teacher Education class:
No

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.
No

D. Explain briefly and clearly the proposed improvement.
Drop ME 2200 and ME 228 from the list of prerequisites.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)
ME 2200 and ME 228 are no longer in the catalog.

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.
Students learn to select and use materials for best performance based on composition, processing and micro-structure.

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

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

Department Curriculum Chair approver: Kangsoong Ro
Date: 03-APR-2019

Comment:
Chair approver: Koorosh Naghshineh
Date: 04-APR-2019
Comment:

- [ ] Approve
- [ ] Deny

Reason for denial:

Comment:

Enter Proposal number only if approved:
Proposal Number: CEAS-191-175-MAE

Complete | Save & Close | Cancel

Attachments

Attach File