Curriculum Course Request WES New Course PAPR 4870 - A-2018-PAPR-137; effective term: 202040

Kecheng Li

Tue 12/18/2018 2:57 PM

To: Raja G Aravamthan <raja.aravamthan@wmich.edu>; Said M Abubakr <said.abubakr@wmich.edu>
Cc: Holly Blanks <holly.blanks@wmich.edu>

2 attachments (62 KB)
Course Syllabus for PAPR 4870.docx, PAPR 4870 SLO Level III Connection WMU Essential Studies Assessment (1).docx;

Please verify your data for New Curriculum Course Request for department: PAPR; college: A.
Go to the following URL to complete your worklist items: https://bwfpi1.cc.wmich.edu:7102/wfbprod

Date of request: 18-DEC-2018

Request ID: A-2018-PAPR-137

College: A

Department: PAPR

Initiator name: Said Abubakr

Initiator email: said.abubakr@wmich.edu

Proposed effective term: 202040

Does course need General Education approval?: N

Will course be used in teacher education?: N

If 5000 level course, prerequisites apply to: U

Proposed course data:
WES New Course PAPR 4870
New course selected: This new course is seeking approval as WMU Essential Studies - Level 3: Connections

1. Proposed course prefix and number:
PAPR 4870

2. Proposed credit hours:
3

3. Proposed course title:
Senior Design Project

https://outlook.office.com/owa/?realm=WMICH.EDU&exsvurl=1&ll=cc=1033&modurl=0
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?
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.
Paper Engineering seniors currently take CHEG 4870, ABET required more PAPR prefix courses.

E. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.).
Paper Engineering seniors currently take CHEG 4870, ABET accreditation required more PAPR prefix courses.

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.
1. Apply ethical, critical, and informed thought within or across disciplines
2. Demonstrate effective and appropriate written communication skills

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.
Initial WMU Essential Studies review and approval

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

I. Effect on your department’s programs. Show how the proposed change fits with other departmental offerings.
Paper engineering student will be able to take own course

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 program conflicts
Same as currently they take similar course (CHEG 4870)
Course Syllabus
PAPR 4870 – Senior Design Project
Spring, 2018

Course Description
Application of chemical engineering to the solution of a complex, open-ended research problem selected in consultation with faculty. The project will involve feasibility analysis, design, and optimization of chemical processes. The project is the culmination of the curriculum and is a major design experience based on the knowledge and skills acquired in earlier coursework and will incorporate appropriate engineering standards and multiple realistic constraints. Emphasis will be on working in small design groups, submission of written report, and oral presentation. This course is approved as a writing-intensive course which may fulfill the baccalaureate-level writing requirement of the student's curriculum. This course meets the student learning outcomes in the WMU Essential Studies Level 3- Connections, Local and National Perspectives Course Category. (3 credits). Spring offering

1. Apply ethical, critical, and informed thought within or across disciplines
2. Demonstrate effective and appropriate written communication skills

Prerequisites & Corequisites: Prerequisite: CHEG 4600, a minimum grade of “C” is required in CHEG or PAPR prefixed prerequisites.

Credits: 3 hours

Notes: Will be offered as honors courses for interested students

Lecture Hours - Laboratory Hours: (1 - 2)

Lecture: M W 4:30 – 5:20 PM D210 Floyd
R 2:30 – 5:20 PM D210 Floyd

Course Coordinator and Instructor:
email
Office: Axxx Floyd, office phone 276-35xx

Instructor:
email
Office: Axxx Floyd, office phone 276-3515

Office Hours: To be announced. Other times are by appointment. Please e-mail two business days in advance to schedule at times other than office hours.


Reference Materials:


3. Allow students to practice in determining what process information or other information are needed to successfully complete a design solution, obtain the necessary data, and analyze it for their project purposes.

4. Develop problem solving techniques and teamwork skills.

5. Develop oral and written communication skills, especially in a small group working in a corporate setting situation.

6. Provide an opportunity for students to apply their knowledge to open-ended engineering problems, formulate solutions, and make clear recommendations for actions to the project sponsor, based on their design solution.

**Course Topics**

1. Applying process design methods and knowledge learned in CHEG 4600 to an open-ended engineering design problem
2. Project management concepts
3. Use of project management tools as part of team-based senior design projects
4. Process feasibility
5. Process optimization
6. Process safety, Process control, and Environmental considerations
7. Calculation of values needed as inputs for performing detailed Cash Flow Analyses
8. Analyze process economics to help drive decision making and recommendations
9. Analyze process risk and sensitivity
10. Effective written reports, project documentation, and oral presentations

**Computer Usage**

A scientific calculator is required. Knowledge of spreadsheet, word processing, and process simulator software is needed for the project assignments.
**Students Working on Project 15**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rewrite of Final Report from CHEG 4600 (due January 18; 4:30 PM)</td>
<td>7</td>
</tr>
<tr>
<td>Project Management Homework (individually completed)</td>
<td>10</td>
</tr>
<tr>
<td>Project Management Concepts Test</td>
<td>10</td>
</tr>
<tr>
<td>Professional Development Events (PDE)*</td>
<td>8</td>
</tr>
<tr>
<td>Individual design notebook, semester long design project</td>
<td>5</td>
</tr>
<tr>
<td>Individual written memorandum style progress*</td>
<td></td>
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<tr>
<td>Reports, due dates to be determined (4 reports)</td>
<td>20</td>
</tr>
<tr>
<td>Design Report 1 (due date to be determined)</td>
<td>10</td>
</tr>
<tr>
<td>Final Report on Design Project (due April 24)</td>
<td>15</td>
</tr>
<tr>
<td>Individual Oral Presentation, Senior Design Day (Tuesday, April 18)</td>
<td>15</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Students working on Project 15 will do rewrites for the Final Report until such time that they have produced materials that are of very good to excellent quality. More than one rewrite of the Final Report will reduce the report grade by 15% per rewrite.

*Students may rewrite the first individual report without any grade penalty after it has been graded and returned, if they so choose.

* Students may rewrite the first PDE without any grade penalty after it has been graded and returned, if they so choose.

Students will be expected to informally present their progress and topics needing discussion or faculty input during meetings with their faculty advisor.
Professional Development Events, also known as Life Long Learning Events - Part of Your Course Grade

sponsored by a Registered Student Organization (RSO) or another professional organization or entity over the course of the semester. Example events could be lectures or seminars presented at WMU; participating in a professional conference or meeting outside of WMU; regular participation in an RSO over the course of the semester, or a community-based activity that broadens your horizons as a student or as a homosapien by engaging in a thoughtful reflection of a meaningful topic or event. After each event that a student attends, you will submit a written memo format report (1 to 2 pages) detailing what lecture was attended; what was learned; and how what you learned can be applied either directly within the PAPR 4870 course, or to your educational or professional experience in general. Written memos must be turned in within three (3) business days of when the lecture or event was held.

By 4:30 PM on Wednesday, April 12, students enrolled in PAPR 4870 will have attended four professional development events, and submitted a 1 to 2-page written memo about what was learned. These reports will provide you additional practice in writing skills, and they count as part of your course grade.

Fundamentals of Engineering (FE) Exam - an Option You Can Explore

Students will register to take the Fundamentals of Engineering (FE) Exam, and should select the one for Chemical Engineers. The exam is no longer a paper exam offered twice per year at testing sites. The FE exam is now an on-line exam, offered at testing centers. Students can register to take it when it is convenient. The nearest testing centers are in Grand Rapids, Ann Arbor, or East Lansing.

The exam is not offered 12 months per year to allow time for updates and data analysis. Please check the on-line information given below to determine actual testing periods during the Spring 2017 semester.

Cost to the student to take the exam is about $225.

Registration and other information (including study materials):

http://www.ncees.org/

http://ncees.org/exams/fe-exam/

Individual Written Progress Reports - Semester Long Project

The individual memorandum style progress reports will document the activities and contribution

of each student during the given time period. The individual design notebook can be used as a good source of materials to be discussed in your individual written progress reports. The report will consist of a written memo detailing individual activities, materials reviewed or originated, knowledge gained, decisions reached, and plans for future work. Also included will be how a student's individual efforts fit into the overall group project and group goals, and discussion and documentation of assignments that were (or were not) completed by the individual, working either in cooperation with another group member, or to support the activities of another group member. Appropriately documented appendix materials will include spreadsheets, flow sheets, or handwritten calculations supporting topics discussed in the written report. The goal of the individual reports is to provide materials of such a quality that they can be included and discussed in the final report to be completed and submitted by the group as a whole. Students are expected to use correct grammar, spelling, and punctuation, as well as the appropriate memorandum report format and style learned in CHEG 4600. Except for the previously mentioned rewrite of the first individual report, other unacceptable individual reports will be returned to students to be rewritten with the loss of one full letter grade. Due dates for reports that are returned for rewriting will be given at the time the report is returned to the student for rewriting.

Individual Design Notebook - Semester Long Project

Students are required to maintain an individual design notebook for the semester long design project. Notebooks will be collected periodically for review and commenting. Notebooks will be either spiral bound, or have a sewn or glued binding. Three-ring binders or other loose-leaf notebooks are not acceptable.
These handouts to be given out in lecture, and deadlines discussed. Please pay attention and make notes for yourself about this topic.
Please Note

All teams submit meeting minutes, agendas, and individual reports to their faculty advisor.

Students working on a Project 15 will need to work with Course Coordinator during the week of January 16 to set deadlines and to define project descriptions and scopes.
## WMU Essential Studies Assessment

### Level III-Connections

<table>
<thead>
<tr>
<th>WMU Essential Studies Student Learning Outcome</th>
<th>Assignments and/or Learning Activities that meet the criteria within the rubric that is aligned with the SLO</th>
<th>When the SLO assessment will take place</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>X</strong> Apply ethical, critical, and informed thought within and across disciplines</td>
<td>Engineering and Professional Ethics paper begins with reviewing engineering code of ethics and a class discussion on professional and team ethics. Students must then submit papers which incorporate possible ethical concerns in the area of the team’s senior capstone project including disciplines of design, production, quality, human resources, and supply chain.</td>
<td>Content delivery during week 1 and 2 of the semester. Papers are due in week 3 of the semester.</td>
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<tr>
<td><strong>X</strong> Demonstrate effective and appropriate written communication</td>
<td>Students develop multiple written documents throughout the semester, including weekly progress reports, project objective statement, project summary poster, and portions of a final technical report.</td>
<td>Progress Reports – assigned week 1 continue through semester Project Objective Statement – due week 4 Summary Poster – due week 13 Final Report – due week 15</td>
</tr>
<tr>
<td><strong>X</strong> Work both independently and in collaboration with others to achieve goals</td>
<td>All students work in teams and supervised by 5-6 faculty to analyze an issue, provide possible solutions or develop a product or process, and ultimately recommend the best option. Teams must collaborate on interactions internally as well as with advisor(s), sponsor(s), and instructor(s). Students must identify and execute approaches to best achieve the project goal and present them both presentation and report format.</td>
<td>Weekly progress reports throughout the semester provide insight into team dynamics and effectiveness. Team presentations occur during weeks 6, 10 and 14. The final report is due in week 15.</td>
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</table>