Curriculum Course Request WES Change Course GPS 4850 - A-2018-PAPR-134; effective term: 202040

Kecheng Li
Fri 12/14/2018 9:06 AM

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

2 attachments (114 KB)
GPS 4850 Syllabus 2018 WES.doc; GPS 4850 SLO Level III Connection WMU Essential Studies Assessment.doc;

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://bwfp1.cc.wmich.edu:7102/wfbprod

Date of request: 13-DEC-2018
Request ID: A-2018-PAPR-134
College: A
Department: PAPR
Initiator name: Said Abubakr
Initiator email: said.abubakr@wmich.edu
Proposed effective term: 202040
Does course need General Education approval?: Y
Will course be used in teacher education?: N
If 5000 level course, prerequisites apply to: U
Proposed course data:
WES Change Course GPS 4850
Specific Course Change type selected: WMU Essential Studies - Level 3: Connections

1. Existing course prefix and number:
GPS 4850

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

3. Indicate which ONE additional required student learning outcome the course will assess:
https://outlook.office.com/owa/?realm=WMICH.EDU&exsvurl=1&ll-cc=1033&modurl=0&path=/mail/search
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?

Initial WMU Essential Studies review and approval

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.)

one section with 20-25 capacity and is not offered on line

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.

Initial WMU Essential Studies review and approval

O. Current catalog copy:

GPS 4850 - Research

Research selection, planning, design, and writing. A research problem selected in consultation with faculty. Student will define and analyze the problem; do a critical review of the literature; and propose a documented research program to increase understanding and knowledge about the problem. This course is a 3-credit hour course in the second semester of the senior design sequence. (3 credits)

Prerequisites & Corequisites: Prerequisite: Senior standing in major.

Credits: 3 hours

Restrictions: Restricted to GPS department majors.

P. Proposed catalog copy:

GPS 4850 - Research Design

Research selection, planning, design, and writing. A research problem selected in consultation with faculty. Student will define and analyze the problem; do a critical review of the literature; and propose a documented research program to increase understanding and knowledge about the problem. This course meets the student learning outcomes in the WMU Essential Studies Level 3: Connections, Local and National Perspectives course category when taken as a 3-credit hour course in the second semester of the senior design sequence. (3 credits)

Prerequisites & Corequisites: Prerequisite: Senior standing in major.

Credits: 3 hours

Restrictions: Restricted to GPS department majors.
GPS 4850 -- RESEARCH DESIGN
COURSE SYLLABUS
Updated, November 29, 2018 (Fall Offering)

Instructors: Undergraduate and Graduate Faculty

Co-ordinator: Raja G. Aravamuthan

Meeting Time: to be arranged. The currently scheduled time on Thursdays will be changed except on Sept. 04. In addition, individual advisors will have their own weekly meeting times arranged with their advisees.

Credits: 3 credit hour

Pre-Requisite: Senior Standing

Course Objectives:

1. To enhance writing skills in relation to research experiments
2. To enhance competency in designing and implementing a research project
3. To experience working in a self-motivated and self-governed environment
4. To understand professional, ethical and legal responsibilities

Topics:

1. How to do a literature review
2. Ethics in Engineering
3. Intellectual Property Issues
4. Communications- written, oral and graphics
5. Use of statistical tools

This course meets the student learning outcomes in the WMU Essential Studies Level 3: Connections, Local and National Perspectives course category when taken as a 3-credit hour course in the second semester of the senior design sequence. (3 credits)

Course Learning Outcomes including WES Student Learning Outcomes:

1. Students will demonstrate the ability to write professional technical reports (Demonstrate effective and appropriate written communication, WMU Essential Studies SLO)
2. Apply ethical, critical, and informed thought within or across discipline
B. Carried out a complete literature search on topic.

C. Developed a complete professionally written mid-term proposal including abstract, problem statement, goals, objectives, background, and bibliography (Please refer to items 2, 3, 4, 5, 6, and 11 on the attached schedule). This will be due at mid-semester and is expected to establish need, general methodology, and the theoretical background for the proposed project.

D. Completed a professionally written report outlining the experimental design for carrying out their research and a detailed budget (Please refer to items 7 to 10 on the attached schedule). This will be due at the end of the semester and will be considered as the blueprint for how the research will be carried out.

E. Orally presented and defended their research proposal, outlining their goals, objective, and planned methodology in front of an audience of peers and faculty.

Required: "Guidelines for the Preparation of Theses, Projects, and Dissertations," The Graduate College, WMU.


Handouts will be distributed in class as appropriate. The student is also expected to use the WMU library and the computer center facilities for literature searches and report generation.

Grading: Grades will be based on the following class components as indicated below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Periodic assignments and exam (coordinator)</td>
<td>25% (10,10,5)</td>
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<tr>
<td>Oral Presentation</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-term Research Proposal (Including draft copy)</td>
<td>15% (10,5)</td>
</tr>
<tr>
<td>Final Research Proposal (Including draft copy)</td>
<td>25% (20,5)</td>
</tr>
<tr>
<td>Outsider evaluation of the final research proposal</td>
<td>25% (20, 5)</td>
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</tbody>
</table>

Grading components (for all written work):

A. Writing style: 40%
   This includes proper grammar (10%), sentence and paragraph structure (10%), spelling (10%), and overall clarity and conciseness of your writing (10%).
The mid term report in its final form should be submitted to the co-ordinator for grading by week 8 (Oct. 25). The final report should be submitted in two copies to the co-ordinator in a suitably bound form by class time on Dec. 06. While only your advisor will evaluate the mid-term report, a second faculty member besides your advisor will evaluate the final report. If you wish to retain a copy for yourself, a third copy should be made.

The evaluation form for the written report is attached.

**Oral presentations** Each student will make a 10-minute oral presentation on his or her project in the last three weeks of the class (and exam week). You should practice the presentation several times before a peer group before actually giving it in front of the faculty and students. You may not use any notes during your oral presentation. Your presentation will be evaluated both by your peers and the faculty members present. The evaluation form for the oral presentation is attached. Attendance during the oral presentations is required and carries points.

**Office Hours**

M 11:00 a.m. to 1:00 p.m., W 4:30 p.m. to 6:00 p.m., and F 1:00 to 2:00 p.m. (without appointment). You can meet with me at other times by a prior appointment. I'll put up my daily work schedule for Fall 2016 around Sept. 104 on my office (A224, CEAS) door, to help you in seeking a suitable time for your appointment. The office hours might be changed after a couple of weeks (once things settle down).

**Ethics**

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.wmich.edu/content.php?catoid=22&navoid=882](http://catalog.wmich.edu/content.php?catoid=22&navoid=882) and the Graduate Catalog at [http://catalog.wmich.edu/content.php?catoid=23&navoid=938](http://catalog.wmich.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.”

**Other University Policies**

FERPA grants students the right to restrict the release of directory information. At WMU students have two options for privacy. They can elect to restrict their address and phone number from being released for publication, or choose to not have any directory information given out. Students wishing to invoke their right to privacy need to complete a request form available on the Registrar’s Office website under the “Student Privacy” link.
Last day to receive 50% refund for a partial withdrawal Sep 12
Last day to receive a 50% refund for a complete withdrawal Sep 24
Last day to receive a 25% refund for a complete withdrawal Oct 22

**Grades**
Midterm grades due Oct 15
Final grades due Dec 18

**Graduation**

Last day to apply for graduation Aug 1
Commencement Dec 15

**Holidays and Recesses**
Labor Day Sep 3
Fall Break Oct 17-19
Thanksgiving (begins at noon) Nov 21
8. FUNDING: (9th and 10th weeks)

Funding accomplished for thesis to date, or prospective sources of funding. Include with prospective funding statement on how and when funding is to be pursued.

9. FACILITIES AND EQUIPMENT: (10th and 11th weeks)

Description of facilities and equipment required and how these will be provided. Also describe any unique equipment or facilities available or will be needed.

10. BUDGET: (11th and 12th weeks)

Cost of the thesis. Usually divided into categories such as personnel, supplies, and materials, travel, data processing, facilities or equipment, including hours and hard cost.

11. REFERENCES: (7th and 9th weeks)

Follow Tappi Journal format and include titles of the articles. Format is shown in the following examples. You are responsible for the accuracy of your citations.


12. APPENDICES: (10th and 12th weeks)

In a highly mathematical paper it may be advisable to present equations and formulas in an Appendix, rather than in the body of the paper. Appendices may also be desirable for detailed descriptions of apparatus and similar material that are not essential to the general presentation of the subject. Also, detailed procedures and extensive data tables belong in the Appendix.

13. COMPLETED RESEARCH PROPOSAL: First draft (12th week); Final draft (13/14th week)

FINAL PROJECT PROPOSAL (TWO COPIES) DUE ON December 06, 2018
words in the key word indexes of the ABIPC, chem. Abstracts or computer search services.

Once you have found an interesting article, use the literature citations in that article to fan out to other and still other same subject and you can find more articles with an author search. Other researchers have already done a good part of covering the older literature, if you let them lead you. Unfortunately, they may have missed something you need because they were researching a different problem and using a different set of key words. USE ALL POSSIBLE METHODS TO SEARCH THE LITERATURE. Search outside of the paper/printing industry.

Use some sort of system that allows you to record as much information as possible short of stacking up You need to read, understand and be able to come back to information later. You may discover later that you need some specific information and vaguely recall reading it earlier. If you have some form of ready reference system you can find it without re-reading all of the articles. Even in this age of computers, I still like using index cards that will have the citation (where the article can be found, etc.) and some key words or ideas. Cards are safe from a computer crash and easier to carry along; pages in a notebook are difficult to sort through or cross reference.

After you have worked on the search for a while go back to the KNOW/NEED TO KNOW chart and see if you have made any progress. We often find the list of need to know grows faster that the know side. At one point (perhaps several times) you will need to practice some convergent sorting and narrow down the number of things you need to know to a workable size. Remember that we do not need to have complete originality in the thesis project, and you don't need to answer all of the world's problems. You do need to complete the project, get the A and graduate.

As you work through the selection of the topic, methodology, etc. you need to be considering your desired level of achievement; don't take too big a project. Don't leave the project open for failure because you failed to be specific on the method of evaluation and analysis of the results. Developing a computer simulation for a process sounds innocent enough, but how accurately must it simulate the process? Consider the need to design a project that has an end, and writing up a proposal that has realistic or measurable goals. Consider the needs for statistical analysis of the data during the design of the experimental work so that you will have enough of the right kind of data to perform meaningful analysis when the project is done. The second largest pitfall is not knowing how to bring the project to closure. You and your advisor MUST agree on the scope of the project in the beginning to avoid having to continue in the lab forever.

STATEMENT OF GOAL OR PROBLEM

A statement of the objective or goal should be in terms of some specific advance in our knowledge in your selected subject area. If it is a problem type statement, it will be open ended in that there are many possible solution sets, and your objective becomes to, for example; assess the effect of other factors, propose or predict outcomes for
In general, a report should have:

1. Title Page
2. Abstract
3. Table of Contents
4. List of Tables
5. List of Figures
6. Introduction
7. Literature Review and Analysis
8. Problem Statement
9. Goals and Objectives
10. Experimental Schematic and Procedures
11. Data Collection and Analysis
12. Budget/Funding
13. Time line (Schedule)
14. Conclusions
15. Literature Cited
16. Appendices

**Title Page**

See Graduate College Thesis Style Manual

**Abstract**

This section is designed for the policy-making executive and so should be complete, but on one page. It is the most important part of the report since it distinguishes the forests from the trees. It includes object, key results, conclusions, and recommendations.

**Table of Contents**

If the report deals with several essential independent subjects, they should be in separate parts, each treated as a sub-report and self-contained. Table of contents should be followed by list of tables and list of figures.

**Introduction**

This begins the detailed report. It presents discussion of the overall and long range objectives and the relationships between them.

**Literature Review and Analysis**

Includes the historical data such as events leading to the problem, literature search, survey of previous or related reports, and interpretation of the previous research findings, i.e. explain “State of the Art.” Analysis of the problem lists specifications to be met and outlines work needed to accomplish the objective.
Dear faculty Advisor,

Please use the following evaluation form for evaluating the attached mid term report of your advisee. Please return the marked reports and evaluation forms to me by next Wednesday at the latest. Thanks for your co-operation.

**PAPR/GPS 4850 -- RESEARCH DESIGN -- REPORT EVALUATION FORM**

**Student's Name:** ___________________________  **Mid-term**

**Evaluator's Name:** ___________________________

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<td>Spelling</td>
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<td>Clarity and Conciseness</td>
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<td>Labeling of Figures and Tables</td>
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<td>Citations and appendices</td>
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<td>Clearly Stated Objectives</td>
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<td>Evidence of Original Thought in</td>
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<tr>
<td>Developing a suitable Experimental Plan</td>
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<td>Use of literature review to develop</td>
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<td>Experimental Plan</td>
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<td>Experimental Details</td>
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<td>Discussion and Analysis of Data</td>
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<td>Background</td>
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<td>Problem statement and objectives</td>
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<td>Conception and logic of experimental plan</td>
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<td><strong>Presentation Skills</strong></td>
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<td>Quality of visuals</td>
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<td><strong>Total</strong></td>
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# PAPR/GPS4850 Record of Project Meetings

**Student** .................................................. **Advisor** ..................................................  

**Title of the Project** ..................................................  

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<th>Meeting date</th>
<th>Comments</th>
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# 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>
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<tbody>
<tr>
<td><img src="image" alt="X" /> 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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<td><img src="image" alt="X" /> 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>
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<tr>
<td><img src="image" alt="X" /> 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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