Curriculum Course Request WES Change Course ECE 2210 - A-2018-ECE-140; effective term: 202040

Bradley J Bazuin
Thu 12/20/2018 8:37 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 (1 MB)
ECE2210 WES Prototype Syllabus V3.pdf; ECE 2210 Assessing WMU Essential Studies Student Learning Outcomes 8.28.18_0 ECE 2210 Electronics I.pdf;

Please verify your data for New Curriculum Course Request for department: ECE; college: A.
Go to the following URL to complete your worklist items: https://bwfps1.cc.wmich.edu:7102/wfbprod

Date of request: 19-DEC-2018
Request ID: A-2018-ECE-140
College: A
Department: ECE
Initiator name: Steven Durbin
Initiator email: steven.durbin@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 ECE 2210
Specific Course Change type selected: WMU Essential Studies - Level 1: Foundations

1. Existing course prefix and number:
ECE 2210

2. Level 1: Foundations
Indicate which course category the course should be placed in:
Oral and Digital Communication

3. How are you going to address this in your course?
https://outlook.office.com/owa/?realm=WMICH.EDU&exsvurl=1&ll-cc=1033&modurl=0
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 department faculty met to discuss the best means of incorporating WES into our two programs (BS electrical engineering and BS computer engineering). It was determined that the proposed changes to ECE 2210 align well with existing efforts to broaden student thinking beyond the direct technical material of the course, and improve their communication skills.

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.
Since the course is taken by majors only (although exceptions could be made for students with an active interest in electronics who have completed prerequisites), there is no anticipated effect on other colleges, departments, or programs.

I. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.
This course is offered each fall and spring; no change is expected.

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.
The change is not expected to have an effect on student graduation, as there is no change to graduation requirements. It is very rare that a student transfers in from another school and is exempted from ECE 2210 at WMU.

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?
Students will likely be electrical engineering or computer engineering majors, with an estimated enrollment of 20 to 40 students per semester. Students will benefit from feedback on preparation and delivering a technical presentation prior to their senior design presentation; the skills will also be useful during a technical interview.

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 change is not anticipated to have any impact on existing resources, or require new resources. It is typically offered each fall and spring semester, with an enrollment between 20 and 40 students; it has a companion lab capped at 20 students per section. Lecture has been taught as a single section, on campus (not online or hybrid) and this is not anticipated to change. Typically, two lab sections are offered each semester, with additional sections added as needed to accommodate demand. The course is not taught online.

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. Do not include details on how the course may be used to satisfy general education requirements.
Department chairs should seek assistance from college advising directors or from the admissions office in completing this section.
We rarely see transfer students who have already taken this course elsewhere. In those rare instances, the student likely would have to elect to take another course, outside the department, which would satisfy the same Foundation I Communication WES requirement.
Instructor: Professor Steve Durbin
steven.durbin@wmich.edu
Floyd Hall (Parkview) B-225
(269) 276-3163
Office Hours: Thursdays 4:00 – 5:00 pm
(and by appointment)

Timetable
Lectures: MWF 8:30 am - 9:20 am
Floyd Hall (Parkview Campus) D-212
Labs: See your schedule for lab section. Labs meet starting week of September 3rd.

Course Description: This is the first course in electronics circuits, and is devoted to the study of electronics devices and basic circuits. We will study and experiment with the pn junction diode, the bipolar junction transistor, and the MOS field effect transistor. We will develop the ability to analyze and design analog and digital discrete circuits. We will also study contemporary issues related to ethical and professional responsibility in engineering situations, and how to effectively communicate in related settings. This course meets the student learning outcomes in the Western Michigan University Essential Studies Level 1 – Foundations, Oral and Digital Communication category.

The analysis and design of integrated circuits are covered in Electronics II. Credits: 4.0

Prerequisite(s): C or better in ECE 2100, PHY 2070, and PHY 2080 (or equivalent)

Required Text

Additional Materials
- Iclinker2 (with REEF access card) ISBN: 9781498601634
- Laboratory Handouts: See E-Learning course page. You must have access during lab.
- Circuit Board: From Electronics Express (http://www.elexp.com) part No. 03MB108
- LTspice Software: http://www.linear.com/design/tools/software/
- Goggles or safety glasses, DMM; Components and S&H for projects as assigned

Course Objectives: This course is designed to develop your ability to:
1. Understand the basic characteristics and models of diodes, BJTs and MOSFETS
2. Design, analyze, simulate, and build analog and digital discrete circuits involving diodes, BJTs, and MOSFETS, including solar cells and photodiodes
3. Select components, interpret terminal characteristics of components, model components, design circuits, and understand circuit operation
4. Document a circuit design, including validation
5. Use application software (e.g. LTspice, MATLAB) for simulating circuits with non-linear devices
6. Locate and interpret component datasheets

1 Mandatory. Note that you must be on time. Late arrivals may not be admitted to minimize distractions to others.
the incomplete policy, and the instructor reserves the right to have the student take the final exam during the next regular offering of the course.

Regrade Policy: Regrade requests must be made, in writing, within one week of the day the assessment item is returned to the class or lab section, in writing. The error in grading must be clearly explained. Verbal discussions prior to submission are acceptable, but are not sufficient.

Grades: The following are minimum requirements; the instructor reserves the right to adjust any of them downward to accommodate natural breakpoints, but will not increase them:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Example Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>85-89</td>
<td>BA</td>
</tr>
<tr>
<td>80-84</td>
<td>D</td>
</tr>
<tr>
<td>75-79</td>
<td>CB</td>
</tr>
<tr>
<td>70-74</td>
<td>C</td>
</tr>
<tr>
<td>&lt; 60</td>
<td>E</td>
</tr>
<tr>
<td>65-69</td>
<td>DC</td>
</tr>
</tbody>
</table>

In extreme circumstances an Incomplete may be granted. If an incomplete is granted the student has the following semester with possible extension to complete missing work. After the allotted time the Incomplete becomes the grade based on submitted work.

The following criteria must be met before an Incomplete is considered:
- The student has at least a passing grade based on the current point total in the semester.
- The student has made a reasonable effort in the course.
- The student has been in communication with the instructor about relevant issues which have undermined course attendance / performance.
- In the case of medical issues, documentation is required.

Western Michigan University Diversity Statements

College Students with Disabilities: Any student with a documented disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the professor and the appropriate Disability Services office (387-4411 or 387-2116) at the beginning of the semester.

Human Rights Statement: It is a fundamental policy of Western Michigan University not to discriminate on the basis of sex, sexual orientation, color, race, age, religion, national origin, height, weight, marital status, or handicap in its educational programs, admissions, employment, promotions, salaries and social activities. Through its example and teaching, Western strives to foster in its students, faculty and staff respect for basic human rights. In its external relationships, the University is supportive of those activities that seek constructive change in the development of human rights in their country and abroad.

Students are responsible for making themselves aware of and abiding by the “Western Michigan University Sexual and Gender-Based Harassment and Violence, Intimate 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 www.wmich.edu/sexualmisconduct.

Western Michigan University Student Academic Conduct Policy:
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,
Learning outcome: Demonstrate effective and appropriate oral and digital communication abilities.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Exemplary</th>
<th>Proficient</th>
<th>Developing</th>
<th>Beginning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Adaptation</td>
<td>Distinct message adaptation to audience, channel, context, and purpose.</td>
<td>Demonstrates awareness of message adaptation to audience, channel, context, and purpose.</td>
<td>Partial awareness of message adaptation to audience, channel, context, and purpose.</td>
<td>Minimal attention of message adaptation to audience, channel, context, and purpose.</td>
</tr>
<tr>
<td>Supporting Material</td>
<td>Utilizes multiple, varied, credible and relevant sources and evidence.</td>
<td>Uses credible and relevant sources and evidence.</td>
<td>Provides minimal relevant and credible sources and evidence.</td>
<td>Presents no sources, or sources that lack relevance or credibility.</td>
</tr>
<tr>
<td>Oral presentation</td>
<td>Incorporates delivery techniques that are compelling and memorable to support the presentation's effectiveness.</td>
<td>Includes effective and appropriate delivery techniques to support the presentation.</td>
<td>Uses delivery techniques that partially support the presentation's effectiveness.</td>
<td>Use of delivery techniques that detract from the presentation's overall effectiveness.</td>
</tr>
<tr>
<td>Mediated presentation (digital)</td>
<td>Incorporates creative or production techniques that are highly effective and compelling and adheres to professional practice and norms.</td>
<td>Includes creative or production techniques that are effective and appropriate with evident attention to professional practice and norms.</td>
<td>Uses creative or production techniques that are partially effective and shows minimal attention to professional practice and norms.</td>
<td>Uses creative or production techniques that are minimally effective with no attention to professional practice and norms.</td>
</tr>
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</table>
## Assessing WMU Essential Studies Student Learning Outcomes

### Level I: Foundations
**Oral and Digital Communications**

<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>X Demonstrate effective and appropriate oral and digital communications</td>
<td>Oral Presentation - case study on ethical and professional responsibility, referenced to professional code of ethics. Representative examples include the Toyota ignition switch, Takata airbag circuit, and onboard battery fires in Boeing aircraft. Topics are updated periodically to be contemporary, but all have an engineering design and electronics related aspect. Component 1: Original slides Component 2: Oral presentation</td>
<td>Content delivery (instructor) in weeks 5-6. Students prepare PowerPoint slides and upload to Elearning as pdf for instructor comments, due week 7. Video practice run uploaded to Elearning or live practice in lab session slot week 9. In-class presentation during week 10-11.</td>
</tr>
<tr>
<td>X Demonstrate and apply information literacy</td>
<td>1. Students must utilize multiple formal sources (e.g., not online encyclopedias), and present contrasting viewpoints in their case study. 2. Formal Design Report – students work in teams of two to design an electronic system to meet provided specifications and within given constraints. Students are required to source components, locate, review, interpret and evaluate appropriate manufacturer datasheets, verify prototype design with computer based simulation tools (typically LTspice), construct, test, and demonstrate the final circuit. A formal report detailing the design process must include the above information, and compare hand calculations, simulations, and real-world performance of their design.</td>
<td>Assessed in tandem with SLO 1 above. Intermediate deliverables are due beginning in week 10. Report and design are due in week 15.</td>
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