**Curriculum Proposal**

Please type or select the requested information. Print completed forms, add appropriate paper attachments, and route through MSU’s curricular process for recommendations and decisions.

<table>
<thead>
<tr>
<th>College: Science, Engineering and Technology</th>
<th>Proposal #: 142</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department: Electrical and Computer Engineering</td>
<td>Effective Date of Change:</td>
</tr>
<tr>
<td>Program: Electrical and Computer Engineering</td>
<td>Academic Year: N0-07</td>
</tr>
<tr>
<td>Type of Change: COURSE PROPOSALS</td>
<td>(For Office Use Only)</td>
</tr>
<tr>
<td>Proposed: Change in Credits</td>
<td></td>
</tr>
<tr>
<td>Title Current: Principles of Engineering Design I</td>
<td>Course Designator Number of Credits</td>
</tr>
<tr>
<td>Title Proposed: Principles of Engineering Design III</td>
<td>EE467 2</td>
</tr>
<tr>
<td>24-Char. Abbrev: Engineering Design III</td>
<td>EE467 1</td>
</tr>
</tbody>
</table>

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):

Course description should remain the same

Prerequisite: EE337 and Senior Standing

**Rationale or Justification for change:**

The need to more completely balance content across all department courses. Reorganization of material into other department courses will allow more rapid coverage of concepts

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**For General Education or Cultural Diversity Courses Only***

**General Education Course:**

<table>
<thead>
<tr>
<th>GE Category #</th>
<th>GE Category Name (Maximum of 3 Categories)</th>
</tr>
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<tbody>
<tr>
<td>N/A</td>
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<tr>
<td>N/A</td>
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<tr>
<td>N/A</td>
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</table>

* For Writing Intensive Courses, attach a description of the kind and quantity of writing.
* For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.

Attach paper copies of the following:

a. Syllabus or course outline.

b. Course's student learning outcomes associated with each GE competency or CD designation.

c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.

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**For New Courses***

<table>
<thead>
<tr>
<th>Instructional Type: Lecture</th>
<th>Course will be offered:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grading Format: Grade P/N</td>
<td>Fall Semester</td>
</tr>
<tr>
<td>Course is elective.</td>
<td></td>
</tr>
<tr>
<td>Course is required for program</td>
<td>Electrical Engineering and Computer Engineering</td>
</tr>
<tr>
<td>Pre- or Co-requisites: EE 337 and Senior Standing</td>
<td></td>
</tr>
<tr>
<td>Other courses are being changed or eliminated. (Explain.)</td>
<td></td>
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</tbody>
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<tr>
<th>Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)</th>
</tr>
</thead>
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<tr>
<td>b. Course's student learning outcomes.</td>
</tr>
<tr>
<td>c. A list of resources required to offer and support this course.</td>
</tr>
<tr>
<td>d. A description of how teaching this course will affect department staffing.</td>
</tr>
<tr>
<td>e. If 400/500 level course, an explanation of added expectations of graduate students.</td>
</tr>
</tbody>
</table>
Proposed Syllabus

Semester: Fall 200?
Course Number: EE 467
Course Title: Principles of Engineering Design I
Course Description: Design and organization of engineering projects. Project proposals, reporting, feasibility studies, and interpretation. Specification preparation, interpretation, and control. Issues involving creativity, project planning and control, and intellectual property rights. Students enrolled in this course must initiate and complete a design in a small group format.
Prerequisite: EE 337 and senior standing

Class Time: Monday 1:00 – 1:50
Class Location: Trafton S352

Team Meetings: Regular team meetings will be required outside of class lecture times

Instructor: William B. Hudson, Ph.D.
Office: Trafton South 137
Phone: (507) 389-5639

Email: William.Hudson@mnsu.edu (please make sure that you put the subject in the subject line)

Office Hours: (Trafton S135)
Monday 9:00 – 9:50; 11:00 – 11:50
Tuesday 10:00 – 11:50
Wednesday 9:00 – 9:50; 11:00 – 11:50

Other times by appointment

References will be provided and identified during the semester – students will also be required to identify appropriate references through their research efforts.

Please note: Assignments in this class will be both group and individual. In all cases when a team assignment is submitted each individual’s effort on the assignment must be shown. Techniques for doing this will be discussed in class – if you are unsure ask!!

The project will be completed as a team effort – you must work together as a team to pass this course!!

Further, it is each student’s responsibility to keep copies of all assignments submitted – you will be required to submit a CD of all assignments at the end of the Fall semester.
Summary of Points Possible:

- Individual draft of Project Requirements Document 10
- Group Project Requirements Document 20
- Individual draft of Project Plan 10
- Group Project Plan 20
- Ethics Presentation 20
- Ethics Executive Summary 20
- Design Review Presentations 20
- Feasibility Report 20
- Design Tool Report Executive Summary 20
- Project Presentation 20
- Project Design Report 100
- Group Assessment Efforts/Teamwork 20
- Notebook Reviews** 20
- Project Functionality and Implementation* 100

* Score will be prorated based on assessment of team members and course instructor
** Course grade reduction will occur for poorly prepared notebooks

*It is expected that the traditional 90, 80, 70 grading curve will be used for this class with one notable exception. You must be present for all activities and turn in all assignments if you want to pass the course. Student must meet minimum competency levels in ALL areas to pass this course!*

Major Components that must be included in your project documentation include:

1. Project specifications which are realistic and appropriate constraints.
2. A project that shows a design that uses analog, digital and microprocessor/microcontroller systems.
3. The project design report must detail hardware software tradeoffs.
4. Examples of appropriate use of CAE tools must exist in your project documentation (this means simulation results)
5. Brainstorming discussions
6. Testing plans and results
7. Intellectual Property discussions
8. Project Costs both estimated and actual
9. Project timelines both estimated and actual (must show actual hours spent by each team member)
10. Software Hardware tradeoff analysis
11. Regulatory issues that must be addressed before this product is taken to market

Project Completion Format - Teamwork

All projects will be completed as part of a design team. Team members and the course instructor will assess each team member's contribution to the effort.

Project Description:
Cheating: Cheating will be dealt with in a manner that is consistent with the action. The severity of the penalty may be a simple reprimand or may result in failure of the course. The goal is for you to learn the material. If you are experiencing trouble in the course discuss it with the instructor – learning the material is easier and far more satisfying than cheating.

Documentation: It is expected that documentation and reports for this course will be prepared in a manner that would be acceptable in the work environment.

Promptness: It is expected that assignments and obligations will be accomplished in a fashion that would be acceptable in the work environment. In the event you determine that you will be unable to complete an assigned task on time, let the instructor know in a timely fashion. Timely notification does not guarantee that a due date can be extended – some times things just have to be completed as scheduled. It should be expected that late assignments will be penalized at a rate of at least 25% per day.

ADA: It is the intent of the instructor of this course to provide a learning environment that is as conducive to learning and the expression of abilities as is possible. If any student in this course has any condition that requires special accommodation to allow them to master or demonstrate mastery of concepts they are asked to contact the instructor as soon as possible.

Participation: Conduct consistent with ethical and supportive business practices will be expected. In paraphrasing the Sprint Code of Conduct – be on time for meetings – be prepared for meetings – do not interrupt – criticize ideas not people – respect each other – provide solutions not just problems.

Incompletes: Incompletes are given for circumstances beyond a student’s control. I don’t interpret this to cover poor planning.

Attendance: Unexcused absences will result in failure in the course.

*Recall the intent of EE 467 and EE 477 is to provide a culminating design experience.*

Your are required to meet minimum levels of preparedness throughout this course sequence as such activities may occur such as pop quizzes or unannounced design reviews that will not add points to the total but will result in the loss of points if not completed satisfactorily.

Again, please note comments in Senior Design Course Outline – All items must be submitted to pass the course. It is also expected that you will work together in a professional manner, just as you would on the job – you don’t have to like your co-workers, but you do have to work effectively with them.

You must keep a laboratory notebook to document your individual accomplishments. This is not an optional course requirement as it is directly related to “IP”.
Meeting 1 Course Introduction – Expectations, Notebook Format, Executive Summary Format, Memo Basics, Requirements Document, Semester Project description and requirements

Meeting 2 Design to Test/ Review of draft project concepts and requirements document

Meeting 3 Brainstorming, Software Documentation

Team Member Assessment Due September ?? by 3:30 PM with lab notebook review

Meeting 4 Industry Presentation – Review of Project Plan

Meeting 5 Industry Presentation – Review of Specifications

Meeting 6 Testing Plans and Teamwork

Meeting 7 Ethics and Ethics Presentations

Meeting 8 Ethics Presentations

Meeting 9 Feasibility Studies

Meeting 10 Intellectual Property

Meeting 11 Product Development – Regulatory Hurdles

Meeting 12 Next Semesters Projects

Meeting 13 Project: Costs/Budgets

Meeting 14 Software/Hardware Tradeoffs

Meeting 15 Final Project Presentations
EE 467 Principles of Engineering Design I (1)

Upon completion of this course, students should demonstrate the ability to:

1. Understand the basic components of feasibility studies.
2. Prepare project specifications.
3. Develop designs using design for test methods.
4. Conduct "brain storming sessions" to support design efforts.
5. Understand the significance and types of "intellectual property".
6. Implement a design based on analog, digital and microprocessor systems.
7. Function on interdisciplinary design teams to complete a project and develop assessment skills for evaluation of team members.
8. Implement designs with adherence to real world constraints- in EE 467 these constraints will be mainly created by the course instructor.
9. Demonstrate appropriate verbal communication skills through project presentations.
10. Students will learn about appropriate project documentation including: Engineering Change Orders, Project Budgets, Project Plans, Testing Plans, Specifications, and Final Project Reports. Students will prepare examples of these based on designs of others.
11. Present, analyze and critique ethics scenarios.
12. Prepare an appropriate engineering notebook.
13. Use "tools" that are appropriate to the practice of engineering to include CAE tools for schematic capture, printed circuit board layout and circuit simulation as well as tools associated with "soft engineering" such as word processors and spreadsheets.
Tentative Syllabus

Semester: Fall 2005
Course Number: EE 467
Course Title: Principles of Engineering Design I
Course Description: Design and organization of engineering projects. Project proposals, reporting, feasibility studies, and interpretation. Specification preparation, interpretation, and control. Issues involving creativity, project planning and control, and intellectual property rights. Students enrolled in this course must initiate and complete a design in a small group format.
Prerequisite: EE 337 and senior standing

Class Time: Monday 1:00 – 1:50, Wednesday 1:00 – 1:50
Class Location: Trafton S352

Team Meetings: Regular team meetings will be required outside of class lecture times

Instructor: William B. Hudson, Ph.D.
Office: Trafton South 137
Phone: (507) 389-5639
Email: William.Hudson@mnsu.edu
Office Hours: Monday 8:00 – 10:00 and 2:00 – 4:00
   Tuesday 3:00 – 4:00
   Wednesday 10:00 – 11:00 and 2:00 – 4:00
   Thursday 8:00 – 10:00
   Other times by appointment

References will be provided and identified during the semester – students will also be required to identify appropriate references through their research efforts.

Please note: Assignments in this class will be both group and individual. In all cases when a team assignment is submitted each individual’s effort on the assignment must be shown. Techniques for doing this will be discussed in class – if you are unsure ask!!

The project will be completed as a team effort – you must work together as a team to pass this course!!

Further, it is each student’s responsibility to keep copies of all assignments submitted – you will be required to submit a CD of all assignments at the end of the Fall semester.

Summary of Points Possible:
   • Individual draft of Project Requirements Document 10
   • Group Project Requirements Document 20
• Individual craft of Project Plan
• Group Project Plan
• Ethics Presentation
• Individual Ethics Executive Summary
• Design Review Presentations
• Feasibility Study Report
• Design Tool Report Executive Summary
• Project Presentation
• Project Design Report
• Group Assessment Efforts/Teamwork
• Skills Competencies Testing
• Notebook Reviews
• Project Functionality and Implementation*

* Score will be prorated based on assessment of team members and course instructor

*It is expected that the traditional 90, 80, 70 grading curve will be used for this class with one notable exception. You must be present for all activities and turn in all assignments if you want to pass the course. Student must meet minimum competency levels in ALL areas to pass this course!*

**Major Components that must be included in your project documentation include:**

1. Project specifications which are realistic and appropriate constraints.
2. A project that shows a design that uses analog, digital and microprocessor/microcontroller systems.
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8. Project Costs both estimated and actual
9. Project timelines both estimated and actual
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11. Regulatory issues that must be addressed before this product is taken to market

**Project Completion Format - Teamwork**

All projects will be completed as part of a design team. Team members and the course instructor will assess each team member's contribution to the effort.

Project Description: The project this semester will be based on a current commercial product manufactured by Winland Electronics. Each group will construct a system that exceeds the current product meeting the requirements described above. The system is to be constructed for a cost of less than $300 and must have comparable functionality. Further it is expected that each design team will add to their system at least one significant additional feature. It is also required that each team will also construct a CPU system to control the system.
Cheating: Cheating will be dealt with in a manner that is consistent with the action. The severity of the penalty may be a simple reprimand or may result in failure of the course. The goal is for you to learn the material. If you are experiencing trouble in the course discuss it with the instructor – learning the material is easier and far more satisfying than cheating.

Documentation: It is expected that documentation and reports for this course will be prepared in a manner that would be acceptable in the work environment.

Promptness: It is expected that assignments and obligations will be accomplished in a fashion that would be acceptable in the work environment. In the event you determine that you will be unable to complete an assigned task on time, let the instructor know in a timely fashion. Timely notification does not guarantee that a due date can be extended – some times things just have to be completed as scheduled. It should be expected that late assignments will be penalized at a rate of at least 25% per day.

ADA: It is the intent of the instructor of this course to provide a learning environment that is as conducive to learning and the expression of abilities as is possible. If any student in this course has any condition that requires special accommodation to allow them to master or demonstrate mastery of concepts they are asked to contact the instructor as soon as possible.

Participation: Conduct consistent with ethical and supportive business practices will be expected. In paraphrasing the Sprint Code of Conduct – be on time for meetings – be prepared for meetings – do not interrupt – criticize ideas not people – respect each other – provide solutions not just problems.

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You must keep a laboratory notebook to document your individual accomplishments. This is not an optional course requirement as it is directly related to "IP".

Outcomes for this course can be found on my website http://mavweb.masu.edu/hudsow/ under the ABET pull down menu.
EE 467 Fall 2005 Class Schedule
Class Time Monday and Wednesday 1:00 – 1:50
Class Location Trafton South 352

August 29 Course Introduction – Expectations, Notebook Format, Executive Summary Format, Memo Basics, Requirements Document

August 31 Semester Project description and requirements

September 5 – Labor Day
September 7 Design to Test
Required group meeting – bring a draft of your project requirements document
Final Requirements Document Due September 9 by 3:30 PM

September 12 Industry Presentation
September 14 Brainstorming
Team Member Assessment Due September 16 by 3:30 PM

September 19 Industry Presentation
September 21 Project Plans

September 26 Industry Presentation
September 28 Specifications
Required group meeting – Bring a draft project plan

October 3 Testing Plans
October 5 Teamwork
Final Project Plan Due October 7 by 3:30 PM

October 10 Ethics
October 12 Ethics Presentations

October 17 Ethics Presentations
October 19 Ethics Presentations
Team Member Assessment Due October 21 by 3:30 PM

October 24 ABET
October 26 Design Review Presentations
Ethics Executive Summary Due October 28 by 3:30 PM

October 31 Design Review Presentations
November 2 Design Review Presentations

November 7 Work Day
November 9 Feasibility Studies
Required group meeting – Bring a draft of next semesters project requirement document

November 14 Intellectual Property
November 16 Product Development – Regulatory Hurdles

November 21 Next Semesters Projects
November 23 Work Day

November 28 Project Costs/Budgets
Team Member Assessment Due November 29 by 3:30 PM
November 30 Software/Hardware Tradeoffs
Required group meeting – Bring a draft of your final project presentation and final project report
Design Tool Executive Summary Due December 2 by 3:30 PM
Feasibility Study Report Due December 2 by 3:30 PM

December 5 Final Project Presentations
December 7 Final Project Presentations
Final Project Report is Due no later than December 9 at 3:30 PM

Team Member Assessment Due December 14 by 3:30 PM
December 15 12:30 – 2:30 Final Exam Period – Final Project Presentations
1 Group Submission showing contribution to each group member
2 Individual Submission
Resources required to support EE467

c. Resources to support this course will result from allocation of existing department resources and with the assistance of the College of Science Engineering and Technology to support and growth and advancement of ECET programs.

d. Staffing resources to support this course will result from allocation of existing department resources and with the assistance of the College of Science Engineering and Technology to support and growth and advancement of ECET programs.