ECE 4900H: Design II with Honors Thesis Project

Course Description
Application of design principles and methodology to conceptual and detailed technical design, implementation and testing, culminating in a capstone design project.

Prior Course Number: 683H
Transcript Abbreviation: Hon Thesis Des 2
Grading Plan: Letter Grade
Course Deliveries: Classroom
Course Levels: Undergrad
Student Ranks: Senior
Course Offerings: Autumn, Spring
Flex Scheduled Course: Never
Course Frequency: Every Year
Course Length: 14 Week
Credits: 3.0
Repeatable: No
Time Distribution: 3.0 hr Lab
Expected out-of-class hours per week: 6.0
Graded Component: Laboratory
Credit by Examination: No
Admission Condition: No
Off Campus: Never
Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: Honors standing, and permission of department, and: Option 1: 2560 (265), 3010 (312), 3020 (323), 3030 (432), 3040 (341), 3050 (352), 3090 (582), and 3900, and Sr standing, and enrollment in ECE (EES subplan). Prereq or concur: 3080 (481). Option 2: 3020 (323), 3090 (582), 3561 (561), 3567 (567), 3900, CSE 2231 (321), and 2451, and Sr standing, and enrollment in CSE (CES subplan). Prereq or concur: 3080 (481) and 5362 (662).

Exclusions: Not open to students with credit for 4900 (682), 4901 (683), or Engr 4903 or 5902.01.

Course Rationale: Existing course being revised to allow focus on design, implementation and testing aspects of capstone project with new course 3900 taken prior term.

The course is required for this unit's degrees, majors, and/or minors: No
The course is a GEC: No
The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.1001
Subsidy Level: Baccalaureate Course

Programs

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>CpE</td>
<td>Computer Engineering</td>
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<tr>
<td>EE</td>
<td>Electrical Engineering</td>
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General Information
The marked recitation time indicates time for oral presentations and for meetings with the research advisor and other collaborators e.g. other honors students, graduate students, faculty, research staff.

**Course Goals**

- Demonstrate competence applying engineering design methods
- Demonstrate competence in the management of a project
- Demonstrate competence in a team-based environment. Student design is part of a larger research effort with others beyond the research advisor, e.g. other honors students, graduate students, faculty, research staff
- Demonstrate mastery in technical writing and presentation skills
- Design, build, demonstrate, and report on a major project, integrating material learned
- Be exposed to relevant engineering standards
- Demonstrate familiarity in considering multiple realistic constraints (e.g. economic, environmental, sustainability, manufacturability, ethical, health and safety, social and political issues) while carrying out their design

**Course Topics**

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<tr>
<th>Topic</th>
<th>Lec</th>
<th>Rec</th>
<th>Lab</th>
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<th>IS</th>
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<tbody>
<tr>
<td>Senior project design</td>
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<td>Project execution, test, and analysis</td>
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<td>Documentation of project (Honor’s Thesis document)</td>
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<td>Final presentation (Honor's Thesis defense)</td>
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**Representative Assignments**

- Project proposal document, with problem definition statement, requirements and systems specifications, project implementation and test plan, Gantt charts and budget estimates.
- Working prototype.
- Final presentation (Honors Thesis defense).

**Grades**

<table>
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<tr>
<th>Aspect</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Design proposal.</td>
<td>25%</td>
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<td>Final report (Honors Thesis Document).</td>
<td>35%</td>
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<tr>
<td>Final presentation (Honors Thesis Defense)</td>
<td>30%</td>
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<tr>
<td>Demonstration of Collaboration</td>
<td>10%</td>
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**Representative Textbooks and Other Course Materials**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
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<tbody>
<tr>
<td>Design for Electrical and Computer Engineers: Theory, Concepts and Practice</td>
<td>Ralph M. Ford and Chris S. Coulston</td>
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**ABET-EAC Criterion 3 Outcomes**

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<tr>
<th>Course Contribution</th>
<th>College Outcome</th>
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<tr>
<td>***</td>
<td>a An ability to apply knowledge of mathematics, science, and engineering.</td>
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### Additional Notes or Comments

Update prereqs to include quarter versions of courses. Add 4901 to exclusions.

Updated course goals to match university format,

Update prereqs to include 3561 instead of withdrawn course 3367 4/23/12

added permission of department to prereqs 10/31/12

Reworded prereqs to include Honors standing for both sub plans, and then rearranged to make it fit the character limit. July 31, 2012

Added "and honors standing."

Added "and permission of department"11/9/12

Change text to Ford and Coulston 3/27/ 13

Added ENGR 4903 to exclusions 11/15/13

Rewrite course goals for consistency with ECE 4900 and 4901 4/29/14 BLA

Update course for program change splitting lecture content into ECE 3900 10/14/14 GJV

Added ENGR 5902.01 to exclusions

Removed ECE 3027 from prerequisites (temporarily) due to transition issues for the ECE program change. Need to add it back when the majority of students in the program have been required to take ECE 3027. Approved by CCAA with 3027 removed today. GJV 9/3/15

Correct exclusions to 4900 instead of 4900H

**Prepared by:** Betty Lise Anderson