

# 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, 3010, 3020, 3027, 3030, 3040, 3050, 3090, 3900 and Sr standing, and enrollment in Electrical Engineering Program of Study (EES subplan) of the ECE major. Prereq or concur: 3080. Option 2: 2050 or 2100; 3020,3027, 3090, 3561, 3567, 3900, CSE 2231, CSE 2451, and Sr standing, and enrollment in Computer Engineering Program of Study (CES subplan). Prereq or concur: 3080 and 5362.

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

**Cross-Listings:**

**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

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

## General Information

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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

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Senior project design								
Project execution, test, and analysis								
Documentation of project (Honor's Thesis document)								
Final presentation (Honor's Thesis defense)								

## 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).
Final report (Honors Thesis Document).

## Grades

Aspect	Percent
Design proposal.	25%
Final report (Honors Thesis Document).	35%
Final presentation (Honors Thesis Defense)	30%
Demonstration of Collaboration	10%

## Representative Textbooks and Other Course Materials

Title	Author
<i>Design for Electrical and Computer Engineers: Theory, Concepts and Practice</i>	Ralph M. Ford and Chris S. Coulston

## ABET-EAC Criterion 3 Outcomes

Course Contribution	College Outcome
***	a An ability to apply knowledge of mathematics, science, and engineering.

Course Contribution		College Outcome
**	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
***	c	An ability to design a system, component, or process to meet desired needs.
***	d	An ability to function on multi-disciplinary teams.
***	e	An ability to identify, formulate, and solve engineering problems.
*	f	An understanding of professional and ethical responsibility.
***	g	An ability to communicate effectively.
**	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
**	i	A recognition of the need for, and an ability to engage in life-long learning.
*	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### 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 prerqs 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

Updated prereqs to include ECE 3027 for both programs, and add 2050 to CE program June 21, 2018

**Prepared by:** Betty Lise Anderson