

ECE 4905: Capstone Design II

Course Description

Application of project management, design principles and methodology to conceptual and detailed technical design, implementation, and testing of a capstone project.

Prior Course Number: 4900

Transcript Abbreviation: Capstone Design 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: 1.0 hr Lec, 2.0 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: 3905 and 3090, or 3906.

Exclusions: Not open to students with credit for 4900, 4900H, 4901, or Engr 5901.01, 5901.02H, 5902.01, or 5902.02H.

Cross-Listings:

Course Rationale: Existing course being revised to allow focus on implementation and testing aspects of capstone project covering two semesters.

The course is required for this unit's degrees, majors, and/or minors: Yes

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: No

Subject/CIP Code: 14.1001

Subsidy Level: Baccalaureate Course

Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

Course Goals

Demonstrate competence applying engineering design methods
Demonstrate competence in the management of a project
Demonstrate competence in a team-based environment

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
Demonstrate the ability to develop test plan and document the results

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Course re-introduction, formal etiquette, group dynamics, effective professional teams and communications	2.0							
Project execution	1.0							
Test plans, test, test procedure, test and analysis reports	2.0							
Final report	1.0							
Team assessment meeting	5.0							
Final presentation	1.0							
Team working project			14.0					
Independent work on project			14.0					

Representative Assignments

Test plan, test report, updated detailed design and status reports.
Working prototype.
Final presentation.
Final report.

Grades

Aspect	Percent
Oral Presentations	30%
Written Assignments	45%
Peer Evaluations	10%
Instructor / Advisor Evaluations	10%
Final project	5%

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
1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics - pre-2019 EAC SLOs (a) and (e); (k) is implied

Course Contribution		College Outcome
	2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors - pre-2019 EAC SLO (c); (k) is implied
	3	an ability to communicate effectively with a range of audiences - pre-2019 EAC SLO (g)
	4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts - pre-2019 EAC SLOs (f) (h) and (j)
	5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives - pre-2019 EAC SLO (d)
	6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions - pre-2019 EAC SLO (b); (k) is implied
	7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies - pre-2019 EAC SLO (i)
***	a	An ability to apply knowledge of mathematics, science, and engineering.
**	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.
**	i	A recognition of the need for, and an ability to engage in life-long learning.
**	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
*	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

CpE ABET-EAC Criterion 9 Program Criteria Outcomes

Course Contribution		Program Outcome
***	1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
**	2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
***	3	an ability to communicate effectively with a range of audiences
*	4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
***	5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
**	6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
***	7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

EE ABET-EAC Criterion 9 Program Criteria Outcomes

Course Contribution		Program Outcome
***	1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
**	2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
***	3	an ability to communicate effectively with a range of audiences
*	4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
***	5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
**	6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
***	7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Prepared by: Betty Lise Anderson