

School of Engineering and Computer Science
ECE 452: Capstone Design II
Master Syllabus

<i>Catalog Data:</i>	ECE 452: Capstone Design II; [T, M] 3 credits Execution phase of the senior design project course sequence; independent or team project proposed in ECE 451 is designed and implemented. Typically offered in Spring.
<i>Class Schedule:</i>	Three lecture hours per week, for one semester.
<i>Laboratory Schedule:</i>	None
<i>Prerequisites by Course:</i>	ECE 451
<i>Prerequisites by Topic:</i>	<ol style="list-style-type: none"> 1. A complete (schedule, cost, ethics, and manufacture) proposal portfolio developed and approved by faculty project review process 2. Electrical/electronic system design including hardware and software components 3. Knowledge of all major areas of electrical engineering (digital, analog electronics, computers, signals and systems, communications, microelectronics, power systems) 4. Design processes and practice 5. Technical writing
<i>Typical Text(s):</i>	None
<i>Typical Reference(s):</i>	None
<i>Course Coordinator:</i>	Dr. Zhi Chen
<i>Course Objectives:</i>	<ol style="list-style-type: none"> 1. Systems design objectives: assign students a project that will allow them to integrate a majority of their skills acquired in the last four years regarding engineering science, design, and communication. 2. Conduct research and apply the knowledge gained in other courses to solve electrical engineering problems, and submit individual progress reports and/or weekly research paper assignments. 3. Draft, revise, and resubmit progress reports and/or research papers as work is being evaluated. Students will be encouraged to work with the WSU Vancouver Writing Center staff throughout the semester. 4. Work in groups on a sponsored project, and will design electrical and/or computer systems with assistance by both faculty and/or an industrial mentor assigned by the sponsor company. 5. Acquire a "customer" ethic by providing deliverables and an appropriate level of engineering service to their sponsor. 6. Learn and demonstrate both oral and written engineering communication skills. 7. Consider cost and time constraints (economic considerations) in execution of a design project. 8. Consider safety, ethical, and other societal constraints in execution of design projects.
<i>Topics Covered:</i>	<ol style="list-style-type: none"> 1. Design process and project planning. 2. Requirements gathering. 3. Engineering ethics, patent law, and negotiation skills.

	<ul style="list-style-type: none"> 4. Engineering organizational structures. 5. Career paths. 6. Technical report writing. 7. Technical oral presentation. 8. Group dynamics and teamwork skills. 9. Integration of skills and concepts developed in previous courses to find a design solution for an industrial project. 		
Lab Experiments and Activities:	None		
Course Outcomes:	Students will be able to:		
	Assessed for Student Outcomes	<ul style="list-style-type: none"> 2-d. Produce solutions that meet sponsor needs for capstone project designs. 3-a. Produce capstone project reports for various audiences using appropriate formats and grammar with discipline-specific conventions including citations. 3-b. Deliver well-organized, logical oral capstone project presentations accommodating audience interests and background, including good explanations when questioned. 4-b. Make ethical judgements in situations involving capstone projects safety, intellectual property, reporting data, etc. 5-a. Establish goals, tasks, timeline, etc. as a team for the capstone project. 5-b. Share responsibilities and information on capstone project schedule and tasks with other members of the team. 5-c. Collaborate with individuals with diverse backgrounds, skills and perspectives in capstone project. 7-a. Use resources effectively to learn new material not taught in class in capstone projects. 7-b. Employ appropriate learning strategies such as communicating with sponsor, using credible sources, experimentation, simulation, etc. 7-c. Apply new knowledge in solving capstone design problems. 	
	Other	<ul style="list-style-type: none"> 2-b. Apply design process to satisfy capstone project requirements for electrical and/or electronic devices and systems. 2-c. Analyze an engineering system within sponsors proposed constraints such as public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors in the design process. 4-a. Evaluate engineering solutions considering the global, economic, environmental and societal impacts for the project. 6-a. Identify the constraints, assumptions, and models for the capstone projects. 6-b. Use appropriate equipment and techniques for capstone projects. 6-c. Conduct analysis and interpretation of the data for capstone projects. 6-d. Draw conclusions by evaluating capstone design results with respect to engineering knowledge. 	
Relationship of Course to Program:	Meets: Educational Objectives <u>1, 2, 3, 4</u> Student Outcomes <u>2,3,4,5,6,7</u>		
Prepared by:	Dr. Zhi Chen	Date:	Mar. 20, 2018; 3/27/18 mb