

<b>MENG410 – Introduction to Capstone Design</b>					
<b>Eastern Mediterranean University</b>					
<b>Faculty of Engineering</b>					
<b>Department:</b> Mechanical Engineering					
<b>Program Code:</b> 23	<b>Program:</b> Mechanical Engineering	<b>Year/Semester:</b> 2019-2020 SPRING			
<b>Course Code:</b> MENG410	<b>Course Title:</b> Introduction to Capstone Design	<b>Credit hours</b>			
		<b>Lec.</b>	<b>Tut</b>	<b>Lab/Activity</b>	<b>Total</b>
		-	-	1	1
<b>Type of Course</b>		<b>Hourly Contribution</b>			
<input checked="" type="checkbox"/> Engineering or Area Core		<input type="checkbox"/> Basic Science (-)			
<input type="checkbox"/> Engineering Course offered by other programs		<input type="checkbox"/> College-level Mathematics (-)			
<input type="checkbox"/> Engineering or Area Elective		<input type="checkbox"/> Complex Engineering Problems (-)			
<input type="checkbox"/> Mathematics and Basic Sciences		<input checked="" type="checkbox"/> Engineering Design (2)			
<input type="checkbox"/> General Education		<input type="checkbox"/> Engineering Science (-)			
		<input checked="" type="checkbox"/> Team (1)			
<b>Criterion 5 Subject Area:</b>					
<input type="checkbox"/> (a) College-level mathematics and basic sciences with experimental experience appropriate to the program.					
<input type="checkbox"/> (b) Engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.					
<input type="checkbox"/> (c) a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.					
<input checked="" type="checkbox"/> (d) a culminating major engineering design experience that					
<input checked="" type="checkbox"/> 1) Incorporates appropriate engineering standards and multiple constraints					
<input checked="" type="checkbox"/> 2) Based on the knowledge and skills acquired in earlier course work.					
<b>Instructor :</b> Project Advisor		<b>Office no:</b> -	<b>Office Tel:</b> -		
<b>Course Web Page:</b> <a href="https://me.emu.edu.tr/en/students/capstone-design-and-projects">https://me.emu.edu.tr/en/students/capstone-design-and-projects</a>					
<b>Textbook(s):</b> There is no mandatory textbook, however, the following are useful.					
• David G. ULLMAN, The Mechanical Design Process, 4th edition, Mc Graw Hill, 2010					
• Michael F. Ashby, Materials Selection in Mechanical Design, 4th Edition, Butterworth-Heinemann, Elsevier, 2011					
<b>Catalog Description:</b> The objective of the capstone design course is to provide students with a realistic independent design experience that allows them to integrate and apply the basic disciplinary material they have learned during their engineering program to design a new product, device or process within multiple realistic constraints, while conforming to relevant standards, ethical issues and environmental policies.					
<b>Pre-requisites</b>	Any other relevant course as required by the project and requested by the supervisor.				
<b>Student Outcomes</b>					
<b>1</b>	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics			<input checked="" type="checkbox"/>	
<b>2</b>	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			<input checked="" type="checkbox"/>	
<b>3</b>	an ability to communicate effectively with a range of audiences			<input checked="" type="checkbox"/>	
<b>4</b>	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			<input checked="" type="checkbox"/>	
<b>5</b>	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			<input checked="" type="checkbox"/>	
<b>6</b>	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions			<input checked="" type="checkbox"/>	
<b>7</b>	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.			<input checked="" type="checkbox"/>	

Course Learning Outcomes		Student Outcomes							Assessment and Percentages	
		1	2	3	4	5	6	7		
1	Define design objectives, design constraints and product specifications according to the stakeholder and project requirements.		X			X				<b>Report</b> 100%
2	Collect and review related data such as technical information, regulations, and standards etc. from credible literature resources, published research, and patents etc. to generate solutions.		X			X		X		
3	Manage concept generation and concept evaluation process, analyze and compare design alternatives/possible solutions, at the system and subsystem levels, and use measures of performance or other criteria to rank alternatives	X	X			X				
4	Develop an effective design strategy and project plan (work breakdown structure) explaining major milestones of the project with their respective timelines, responsibilities and resource allocation (Cost) to ensure timely and within-budget completion of the project.		X			X				
5	Design a system to meet the design criteria and constraints (such as cost, economic, resource availability, environment, sustainability, safety, manufacturability, assembly, reliability, testing and maintenance, and product life cycle considerations).	X	X		X	X				
6	Develop detailed manufacturing process plan by selecting the suitable manufacturing techniques for fabrication and assembly of the product.		X			X				
7	Develop the testing plan for verification and validation of the project objectives according to the relevant engineering standards. (at least one primary design requirements)		X			X	X			
8	Understand the significance of relevant engineering standards for materials, components, manufacturing and product qualification		X			X				
9	Understand the major characteristics of engineering drawings and generate engineering drawings according to the technical drawing standards (layout, assembly drawing, parts drawings, etc.)		X			X				
10	Manage design documentation and communication (both orally and in writing) using language and graphics appropriate to the technical discipline, with the necessary supporting material, to achieve desired understanding and impact.		X	X	X	X				
<b>%age weight of Student Outcomes</b>		<b>L</b>	<b>H</b>	<b>L</b>	<b>L</b>	<b>H</b>	<b>L</b>	<b>L</b>		

**Important Notes Regarding the Course:** University rules and regulations are applied to this course. For details, please see <http://mevzuat.emu.edu.tr>

### **Course Rules and Regulations:**

1. Each Capstone Team group must have maximum 5 and minimum 3 students.
2. The projects must meet most of the Economic, Availability, Environmental, Sustainability, Manufacturability, Ethical, Social, Political, Health and Safety, Constraints etc.
3. The relevant standards (like ASTM, ANSI, ASME, ASHRAE, TS-EN etc) must be followed during the course of the project and must be referred to in the annexures in the report.
4. Website explaining the Project Team, Scope, Objectives, and highlighting the Economic, Availability, Manufacturing, Ethical, Social, Political Constraints etc should be ready by the **Third Week** of the semester. The **website** should be regularly updated by the project team on weekly basis.
5. The progress should be demonstrated and weekly updated on the website using a **Gantt Chart**. The progress will be monitored by the supervisor and the coordinator.
6. Soft copies of the DRAFT REPORT should be submitted to the Supervisor for evaluation before the **start of Mid Term Exams**.
7. Soft copies of the FINAL REPORT should be submitted to the Supervisor for evaluation **2 Weeks before the Start of Final Exams**.
8. Each part of the report should be checked by the supervisor for the format, plagiarism and all the necessary requirements before the submission to the coordinator.
9. Soft copies of the FINAL REPORT should be submitted to the Coordinator for evaluation **1 Week before the Start of Final Exams**.
- 10. Deadline for submissions will have no extensions.**
11. For the FINAL REPORTS, 1 to 5 days late, a penalty of 10% (of the overall evaluation) per day will be penalized. Students who submit their reports after 5 days will receive a grade of F.
12. A plagiarized report with more than 20% plagiarism will receive a grade of F.