

**DEPARTMENT OF AERONAUTICAL ENGINEERING  
COURSE SYLLABUS**

**AE 499: Senior Project**

<i>COURSE TITLE</i>	<i>ENGLISH CODE/NO</i>	<i>ARABIC CODE/NO.</i>	<i>CREDITS</i>			
			<i>Th.</i>	<i>Pr.</i>	<i>Tr.</i>	<i>Total</i>
<b>Senior Project</b>	AE 499	هـ ط ٤٩٩	٢	٦		٤
<b><i>Pre-requisites:</i></b>	IE 255, AE 432, AE 412					
<b><i>Course Role in Curriculum</i></b> <i>(Required/Elective):</i>	Required Course					
<b><i>Catalogue Description:</i></b> The student is required to function on multidisciplinary team to design a system, component, or process to meet desired needs within realistic constraints. A standard engineering design process is followed including the selection of a client defined problem, literature review, problem formulation (objectives, constraints, and evaluation criteria), generation of design alternatives, work plan, preliminary design of the selected alternative, design refinement, detailed design, design evaluation, and documentations. The student is required to communicate, clearly and concisely, the details of his design both orally and in writing in several stages during the design process including a final public presentation to a jury composed of several subject-related professionals.						

**Textbooks:**

1. Clive L. Dymn and Patrick Little, Engineering Design- A project based introduction, John Wiley & Sons, Third edition, 2009.

**Supplemental Materials:**

1. Bahattin karagözoğlu, *A Guide to Engineering Design Methodologies and Technical Presentation*, KAU, faculty of engineering, department of electrical and computer engineering, 2007.

**Course Learning Outcomes:**

*By the completion of the course the student should be able to:*

1. Analyze a project statement, brief, or proposal to identify the real problem and the most relevant needs and operational constraints.
2. Demonstrate ability to achieve project objectives using independent, well organized, and regularly reported multidisciplinary team management techniques that integrate, evaluate, and improve different skills of team members.
3. Collect and review related data such as technical information, regulations, standards, and operational experiences from credible literature resources.
4. Plan an effective design strategy and a project work plan, using standard project planning techniques, to ensure project completion on time and within budget.
5. Identify potential customers, their needs, and their operational constraints.
6. Integrate previous knowledge from mathematics, basic sciences, engineering fundamentals and discipline related courses to address the problem.
7. Discuss all applicable realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
8. Demonstrate understanding of ethical responsibility

9. Define design objectives, measures of design viability, and the evaluation criteria of the final project and reformulate the problem based on collected data.
10. Generate possible solutions; compare alternatives, and select one alternative based on evaluation criteria and feasibility analysis.
11. Demonstrate Knowledge of contemporary issues
12. Implement a planned design strategy for a product-based design or experimental design project as applicable
13. Communicate design details and express thoughts clearly and concisely, both orally and in writing, using necessary supporting material, to achieve desired understanding and impact.

**Topics to be Covered:**

**Duration  
in Weeks**

1. Project Statement	1
2. Working in Teams	1
3. Project Scoping	1
4. Project Management and Scheduling	2
5. Problem Definition	3
6. Ethics in Engineering	1
7. Conceptual Design	4
8. Contemporary Issues	1
9. Implementation phase	12
10. Developing Project Charter, Poster, Final report writing, and oral presentation	2

**Student Outcomes addressed by the course:** (Put a ✓ sign)

(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 within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	✓
(d) an ability to function on multidisciplinary 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, economic, environmental, 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.	✓

**Key Student Outcomes assessed in the course:** (c), (d), (f), (g), (h), (i), and (k)

***Instructor or course coordinator:*** Prof. Ali Al-Bahi

***Last updated:*** May 2015