

**DEPARTMENT OF AERONATICAL ENGINEERING  
COURSE SYLLABUS**

**AE 465: Aircraft Design**

COURSE TITLE	ENGLISH CODE/NO	ARABIC CODE/NO.	CREDITS			
			Th.	Pr.	Tr.	Total
<b>Aircraft Design</b>	<b>AE465</b>	<b>٤٦٥ طء</b>	٢	٣		٣
<b>Pre-requisites:</b>	AE 362					
<b>Course Role in Curriculum</b> <i>(Required/Elective):</i>	Elective Course					
<b>Catalogue Description:</b> Aircraft Sizing, Determination of takeoff, empty, and fuel weight, sensitivity analysis to takeoff weight, selection of the overall configuration, discussion of the aircraft systems, cost prediction.						

**Textbooks:** J. Roskam, Airplane Design, Dar Cop, Part I through VIII, by.  
*(Author, Title, Pub., year)* 1990

**Supplemental Materials:** Course Notes: First day materials, Course project, Guide to assignments

**Course Learning Outcomes:**

By the completion of the course the students should be able to:

1. Identify an appropriate set of mission specifications and sketch the mission profile of an airplane.
2. Perform a literature search and collect data to show the need for a particular airplane
3. Estimate the takeoff weight of an airplane based on the mission specification, by using the weight fraction method.
4. Perform a sensitivity analysis of the designed airplane
5. Construct a matching graph, based on specific performance constraints, such as stall speed, cruise speed, takeoff distance, and landing distance, and use it to predict the required thrust loading and wing loading of the designed airplane
6. Evaluate the configuration of airplanes and describe the connection between configuration choices (ex. High wing, tandem landing gear) and mission specification
7. Manage teamwork effectively by integrating different skills and abilities of team members.
8. Write high quality design reports using correct language and terminology, correct technical information, and professionally prepared graphs and tables
9. Give clear, informative, and technically correct oral presentations using professionally prepared visual aids

**Topics to be Covered:**

<u>Topics to be Covered:</u>	<u>Duration in Weeks</u>
1. Determination of weights, and derivation sensitivities	3
2. Derivation and discussion of performance constraints	3
3. Selection of the overall configuration	2
4. Detailed discussion of why's and how's of the design	2
5. Discussion of the aircraft systems	2
6. Airplane cost analysis	1
7. Technique for Order Preference by Similarity to Ideal Solution TOPSIS	1

**Key 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) and (g)

***Instructor or course coordinator:*** Dr. Wail Harasani

***Last updated:*** May, 2015