Program and Degree: **BSc in Aerospace Engineering**	
Course Description	
Course Title	**Airplane Design I**
Prerequisites	Flight Mechanics 2
The course aims	The purpose of this course is to familiarize aerospace engineering students with the methodology and decision making involved in the process of designing airplanes
Contents	1- Introduction to Airplanes Types, Missions, 2- Estimating Take-off Cross Weight, Empty Weight, and Mission Fuel Weight a. General Outline of the Method b. Determination of Mission Payload Weight and Crew Weight c. Guessing A Likely Value of Take-off Weight d. Determination of Mission Fuel Weight e. Finding The Allowable Value for Empty Weight f. Sensitivity Studies and Growth Factors 3- Estimating Wing Area, Take-off Thrust (or Take-off Power) and Maximum Lift (Clean, Take-off, Landing) a. Sizing to Stall Speed Req. b. Sizing to Take-off Distance Req. c. Sizing to Landing Distance Req. d. Sizing to Climb Req. e. Sizing to Maneuvering Req. f. Sizing to Cruise Speed Req. g. Matching Diagram 4- Configuration Design 5- Selection of The Overall Configuration 6- Design of Cockpit and Fuselage Layouts 7- Selection and Integration of The Propulsion 8- Wing Plane form Design and Sizing and locating Lateral Control Surfaces 9- Verifying Clean Airplane Maximum Lift Coefficient and Sizing High Lift Devices 10- Empennage Sizing and Disposition and Control Surface Sizing and Disposition 11- Landing Gear Sizing and Disposition 12- Weight and Balance Analysis 13- Stability and Control Analysis a. Static Longitudinal Stability b. Static Directional Stability

	c. Minimum Control Speed with One Engine Inoperative 14- Drag Polar Determination 15- Finalizing Preliminary Design and The Preliminary Three view
Duration	**1 Semester (16 weeks)**
Course Hours	**3 hours/week**
Course Type	**Required**