COURSE OUTLINE:

This course will present the entire process of aircraft conceptual design - from requirements definition to initial sizing, configuration layout, analysis, sizing, optimization, and trade studies.

INSTRUCTOR:

Prof. A. K. Ghosh
Department of Aerospace Engineering
IIT Kanpur

ABOUT INSTRUCTOR:

Prof. A.K. Ghosh is a faculty of Aerospace Engg. Department of IIT Kanpur. He is also the in-charge of the flight laboratory and unmanned aerial vehicle of IIT Kanpur. His research areas include system identification through flight tests using conventional and neural network based methods, design of aircrafts and airborne projectiles, supercavitation, unmanned aerial systems. Before joining IIT Kanpur, he worked as a scientist with Defense Research Development Organization (DRDO). He has published many peer reviewed journal papers and conference papers, guided 13 doctoral students, and 38 masters students. He is also a mentor of multiple aerospace start-up companies, and also been associated with major industry contributions of high speed low drag aircraft bomb, Pinaka Mk-I, 105mm sabot round for tracked vehicles, etc.

COURSE PLAN:

Week 1 : Overview of the Design Process
Week 2 : Initial Sizing
Week 3 : Aerodynamic Considerations
Week 4 : Crew Station, Passengers, and Payload
Week 5 : Propulsion and Fuel System Integration
Week 6 : Step-by-Step Development of a New Design
Week 7 : Structures and Loads
Week 8 : Stability, Control, and Handling Qualities
Week 9 : Performance and Flight Mechanics
Week 10 : Cost Analysis
Week 11 : Sizing and Trade Studies
Week 12 : Design of Unique Aircraft Concepts