INTRODUCTION TO AEROSPACE ENGINEERING

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TYPE OF COURSE : Rerun | Core | UG
COURSE DURATION : 12 weeks (20 Jul'20 - 09 Oct'20)
EXAM DATE : 18 Oct 2020

INTENDED AUDIENCE : Any discipline of Engineering
INDUSTRIES APPLICABLE TO : DRDO, HAL, NAL, IAF

COURSE OUTLINE :
The aim of this course is to provide a general overview of the field of Aeronautical Engineering to interested students. Each Lecture will cover a specific concept or area relevant to the subject. An attempt will be made to cover the contents in an interesting manner, by a judicious use of a mix of powerpoint presentations, in-class activities, quizzes, innovative and hands on assignments that will not only increase the awareness of the students, but also satiate their curiosity and desire to know more about the various concepts related to the subject.

ABOUT INSTRUCTOR :
Prof. Rajkumar S. Pant has Bachelors, Masters and Ph.D. degrees in Aerospace Engineering. His areas of specialization include Aircraft Conceptual Design, Air Transportation, and Optimization. He has been a faculty of Aerospace Engineering Department at the Indian Institute of Technology Bombay since December 1989. Prof. Pant is an alumnus of College of Aeronautics, Cranfield University, UK, where he earned his Ph.D. under Commonwealth Scholarship Scheme, IIT Madras where he did his Masters in Aeronautical Engineering, and PEC Chandigarh where he underwent his undergraduate studies in Aeronautical Engineering. He has also worked for five years in Hindustan Aeronautics Limited, in the Design and Engineering Department. He has published and presented 220 scientific papers, of which 170 are in international journals and conferences.

COURSE PLAN :

Week 1 : Nomenclature of aircraft components & Atmosphere and its properties
Week 2 : Fluid Mechanics – I : Streamlines + Steady flow + Incompressible flow
Week 4 : Aerodynamics – I : Airfoils, and Lift generation Theories
Week 5 : Aerodynamics – II : Critical Mach no., Wave Drag, Swept wings, Finite Wings, Induced Drag
Week 6 : Propulsion & Structures : Types of Propulsive systems, V-n Diagram
Week 7 : Aircraft Performance - I : Steady Level Flight and Altitude effects
Week 8 : Aircraft Performance- II : Ceilings, Steady Climbing Flight, Sustained Level Turn, Pull up Maneuver
Week 9 : Aircraft Performance- III : Range and Endurance, Takeoff and Landing
Week 10 : Aircraft Stability and Control : Longitudinal Static Stability, Control Systems and Neutral Point
Week 11 : Airports : Planning & Design of Airports, ILS system
Week 12 : Aircraft Operations : Introduction to Air Traffic management