

1.	Title of the course	Fundamentals of Aerodynamics
2.	Course number	ME528L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	New
5.	To be offered by	Mechanical Engineering
6.	Proposed by	Krishna S Addepalli
7.	Prerequisite	CoT
8.	<b>Course Objective(s):</b> To introduce the concept of forces on bodies immersed in a fluid flow; To explain the concepts of incompressible and compressible flows, and their application to airfoils with relevant mathematical background.	
9.	<b>Course Content:</b> Review of the basics of fluid mechanics; Airfoil nomenclature and characteristics; Incompressible flow over two dimensional airfoils, Kelvin's circulation theorem, thin airfoil theory, airfoil drag, estimating skin-friction drag for laminar and turbulent flows; Incompressible flow over finite wings, downwash and induced drag, Biot-Savart law, Prandtl's lifting line theory; Subsonic compressible flow over airfoils, linear theory, drag divergence Mach number; Introduction to supersonic and hypersonic flows; Linearized supersonic flow; Conformal transformation; Zhukovsky transformation.	
10.	<b>Textbook(s):</b> 1. Anderson J D and Cadou C P, Fundamentals of Aerodynamics, 7th Edition, McGraw Hill (2023). 2. Kermode A C, Mechanics of Flight, 11th Edition, Pearson (2006).	
11.	<b>Reference(s):</b> 1. Houghton E L and Carpenter P W, Aerodynamics for Engineering Students, 5th Edition, Butterworth-Heinemann (2003). 2. Anderson J D, Introduction to Flight, 7th Edition, McGraw Hill (2011).	