Course Title	Aerodynamics				
Course Code	ME401				
Course Type	Technical Elective				
Level	BSc (Level 1)				
Year / Semester	3rd or 4th year / Spring				
Teacher's Name	Professor Varnavas C. Serghides				
ECTS	6	Lectures / week	3	Laboratories / week	
Course Purpose	This course introduces students to the topic of Aerodynamics and its broad applications. It provides an overview of the associated fundamental theories and also the various practical methodologies that are available to Industry. It aims to teach students how to accurately predict the Lift and Drag forces acting on solid bodies and lifting surfaces immersed in airflow.				
Learning Outcomes	Upon the successful completion of this course, students will be able to: 1. Recognize the widespread applicability of Aerodynamics 2. Classify the range of methodologies and tools available for aerodynamic analysis, into various general categories 3. Define the key aerofoil design characteristics and select the right aerofoil for a given application 4. Calculate the geometric and aerodynamic parameters of lifting, control surfaces and high-lift devices 5. Derive the aerodynamic forces acting on a body or lifting surface and their corresponding coefficients 6. Perform a full Lift and Drag estimation analysis 7. Employ the appropriate aerodynamic methodologies to solve various practical examples 8. Explain the various wind tunnel types, testing process, and estimate the modeling parameters				
Prerequisites	None	Corequisites	None		
Course Content	• Introduction and Course Overview • Applications of Aerodynamics • Fundamental Theories of Aerodynamics • Aerodynamics Methodologies and Tools • Aerofoil Design Characteristics • Lifting Surfaces and Bodies • Control Surfaces				

	• High-Lift Devices • Aerodynamic Forces and Coefficients • Total Lift Estimation • Total Drag Estimation • Practical Lift and Drag Estimation Examples • Wind Tunnel Modeling and Testing
Teaching Methodology	• This course is presented with the aid of several PowerPoint slides, photos and videos, while the whiteboard is used for detailed analytical work. Copies of all the slides presented during the course are available on the university's e-learning platform. The course material is further enhanced with numerous case studies, relevant recent research results, examples and detailed practical explanations. Question and answer sessions augment the overall student interest and learning experience. The recommended references provide further reading material.
Bibliography	**RECOMMENDED REFERENCES** • Donald F. Young, Theodore H. Okiishi, Bruce Roy Munson, Fundamentals of Fluid Mechanics, John Wiley & Sons, 4th edition, 2002 • John D. Anderson, Fundamentals of Aerodynamics, McGraw-Hill Education, 2001 • John J. Bertin, Aerodynamics for Engineers, 4th edition, Prentice Hall, 2001 • Joseph Katz, Allen Plotkin, Low-Speed Aerodynamics, Cambridge University Press, 2001 • Raymer, D.P., Aircraft Design – A Conceptual Approach, American Institute of Aeronautics and Astronautics, 2012
Assessment	• Assignments (15%) • In-class Tests (25%) • Final Exam (60%)
Language	English