Objectives:
Introduction to fundamental concepts, fluid statics; integral and differential analysis; detailed analysis of inviscid, incompressible flows; aerodynamics of airfoils and wings.

Prerequisites: Mathematics 427L with a grade of at least C, credit or registration for Aerospace Engineering 120K.

Knowledge, skills, and abilities students should have before entering this course:
Working knowledge of calculus and differential equations, statics and dynamics. Ability to: (1) draw free body diagrams; (2) solve dynamics problems using Newton's laws of motion.

Knowledge, skills, and abilities students gain from this course:
Ability to: (1) compute pressure distribution in a static fluid; (2) determine resultant force and moment on a body subjected to a pressure distribution; (3) use control volume analysis to solve flow problems; (4) use the differential equations for fluid motion to solve simple flow fields; (5) use dimensional analysis for scaling experimental results; (6) solve flows past wings and bodies.
If you don't have them already, this course will help you develop effective problem-solving skills.

Impact on subsequent courses in curriculum:
This material is needed for Propulsion (ASE 376K), Flight Dynamics (ASE 367K), Boundary Layer Theory and Heat Transfer (ASE 340), and the senior Design classes. It is also needed for elective courses like Compressible Flow (ASE 362K), Viscous Fluid Flow (ASE 346), etc.

ABET Program Criteria outcomes achieved:

Criterion		Criterion		Criterion	
A. Aerodynamics	√	G. Orbital Mechanics		M. Preliminary/Conceptual Design	
B. Aerospace Materials		H. Space Environment		N. Other Design Content	
C. Structures		I. Attitude Determination and Control		O. Professionalism	
D. Propulsion		J. Telecommunications		P. Computer Usage	√
E. Flight Mechanics		K. Space Structures			
F. Stability and Control		L. Rocket Propulsion			

ABET Criteria 2000 outcomes achieved:

Outcome		Outcome	
a. An ability to apply knowledge of mathematics, science, and engineering	√	g. An ability to communicate effectively	√
b. An ability to design and conduct experiments, as well as to analyze and interpret data		h. The broad education necessary to understand the impact of engineering solutions in a global/societal context	√
c. An ability to design a system, component, or process to meet desired needs		i. A recognition of the need for and an ability to engage in life-long learning	√
d. An ability to function on multi-disciplinary teams		j. A knowledge of contemporary issues	√
e. An ability to identify, formulate, and solve engineering problems	√	k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	√
f. An understanding of professional and ethical responsibility	√		

Topics: (Based on 28 meetings for class scheduled TTh – equivalent to 42 meetings of class scheduled on MWF)
Introduction and Overview (a,e,g; A) - 2 classes
Fluid statics (a,e,g; A) - 3 classes
Control volume analysis (a,e,g; A) - 6 classes
Differential analysis of fluid motion (a,e,g; A) - 4 classes
Dimensional analysis (a,e,g; A) - 2 classes
Viscous internal flows (a,e,g; A) - 3 classes
Viscous external flows and boundary layers (a,e,g; A) - 3 classes
Wing and airfoil theory (a,e,g; A) - 4 classes
(Mid-term Tests – 2 classes)

Note: Some of the ABET "outcomes" (e.g. f-j) are part of a meta-curriculum; for example I will occasionally refer to professional/ethical issues, or to the global context in which propulsion engineering problems are formulated and solved, but I will not be devoting individual classes to these topics.

Computer:
Computer spreadsheets and programs such as Matlab will be useful for solution of some problems especially those involving potential flows.

Attendance:
Your grades are determined by your performance on tests and homework. I strongly encourage you to attend class but I do not require it. I believe you are a responsible adult who can decide if attending class is worth your time. However, I will not tutor you in my office on topics that were discussed in classes you did not attend. Homework must be turned in on time to receive credit and you must attend all tests unless you have a documented medical reason for being absent.

Special notes:
1. The University of Texas at Austin provides upon request appropriate academic adjustments for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TDD or the College of Engineering Director of Students with Disabilities at 471-4321.
2. If a test conflicts with a religious holiday that you observe, please notify me in advance so I can arrange an alternate test date for you. The same rules apply to homework submission