Aerodynamics
EAS4101 Section#0076, Class ID 11246

Lecture Location and Time: **FLG0280**
Class Periods: **MWF 3 (9:35 am to 10:25 am)**
Academic Term: **Spring 2026**

It may become necessary to modify this syllabus during the semester.
In this event, students will be notified, and the revised syllabus will be posted on the course web site.

Instructor:
Bruce Carroll
Room 131 NEB
bfc@ufl.edu
352-392-4943 (office)
Office Hours: TBD (held via Zoom.)
You can always contact the instructor to arrange meetings (Zoom or In-Person) at other times.

Course Description:
Incompressible aerodynamics, integral and differential governing equations, potential flow, boundary layers, airfoils, wings, numerical techniques. Credits: 3

Course Pre-Requisites / Co-Requisites:
(EAS2011 or EAS3020C or EGN3353C) and COP2271; EML3100, MAC2313 and MAP2302 with minimum grades of C

Materials and Supply Fees: None

Course Objectives:
The objective of the course is to introduce students to incompressible aerodynamics. Students will learn underlying theory derived from fundamental engineering science principles and will apply the theory to solve complex engineering problems using knowledge of mathematics and numerical techniques. In addition, students in this course will develop communication skills and continuing education skills. The objective will be achieved through:

- Class lectures and examples
- Student completion of homework and project
- Student preparation for and completion of exams

Professional Component (ABET):
This course prepares graduates to have a knowledge of aerodynamics and to have design competence that integrates aeronautical topics.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High

2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3) an ability to communicate effectively with a range of audiences	Low
4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Low

*Coverage is given as high, medium, or low. An empty box indicates outcome not significantly addressed by this course.

Required Textbooks and Software:

- *Aerodynamics for Engineers*, Bertin, J. and Cummings, R., Cambridge University Press, 2022, 6th Edition, ISBN 9781009098625

Additional Recommended Materials:

- *Fundamentals of Aerodynamics*, John D. Anderson, Jr., McGraw-Hill, 2017, Sixth Edition,
- *Low Speed Aerodynamics from Wing Theory to Panel Methods,* Katz and Plotkin, McGraw-Hill, 1991.
- *Basic Aerodynamics: Incompressible Flow*, Gary Flandro, Howard McMahon and Robert Roach, 2012.

Required Computer:

It is important that you have your own computer. https://mae.ufl.edu/students/undergraduate/computer-requirements/

Course Schedule and Important Dates:

See table at end of syllabus.

Attendance Policy, Class Expectations, and Make-Up Policy:

Regular class attendance is expected as it will improve your performance in the course. Late HW and makeup exams are only allowed for students with documented circumstances consistent with UF policy. Students must contact the instructor as soon as possible to provide documentation and request a make-up exam. Excused absences must be consistent with university policies in the undergraduate catalog and require appropriate documentation. For more information on UF policies see https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Evaluation of Grades:

- Homework: Homework will be assigned periodically during the semester. Students must submit HW online by the due date to receive credit.
- Project: Students will work individually on the class project. The project must be submitted by the due date to receive credit.
- During Term Exams: Three exams will be given during regular class time.

Assignment	Percentage of Final Grade
Homework	15%
Project	10%
During Class Exams (3)	75%
No Final Exam	
	100%

Grading Policy

Percent	Grade	Grade Points
94 to 100	A	4.00
<94 to 90	A-	3.67
<90 to 87	B+	3.33
<87 to 84	B	3.00
<84 to 80	B-	2.67
<80 to 77	C+	2.33
<77 to 74	C	2.00
<74 to 70	C-	1.67
<70 to 67	D+	1.33
<67 to 64	D	1.00
<64 to 61	D-	0.67
<61 to 0	E	0.00

Academic Policies & Resources:
To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: https://go.ufl.edu/syllabuspolicies. Instructor-specific guidelines for courses must accommodate these policies.

Commitment to a Positive Learning Environment:
The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Undergraduate Coordinator
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu

			EAS4101 Aerodynamics -- Tentative Course Schedule Spring 2026
1	M	1/12	Lecture 1: Intro & Syllabus
2	W	1/44	Lecture 2: Basic Concepts, Fluid, Pressure, Viscosity, Speed of Sound, Continuum, Units
3	F	1/16	Lecture 3: Standard Atmosphere
	M	1/19	Holiday
4	W	1/21	Lecture 4: Fundamentals of Fluid Mechanics, Frames of Reference, Conservation of Mass (differential form)
5	F	1/23	Lecture 5: Substantial Derivative, Conservation of Linear Momentum (differential form), Navier-Stokes Equations
6	M	1/26	Lecture 6: Conservation of Mass in Control Volume Form
7	W	1/28	Lecture 7: Conservation of Linear Momentum in Control Volume Form
8	F	1/30	Lecture 8: Examples
9	M	2/2	Lecture 9: Examples
10	W	2/4	Lecture 10: The Energy Equation, Euler's Equation and reduction to Bernoulli's Equation
11	F	2/6	Lecture 11: Flow Kinematics (This material is NOT in the textbook)
12	M	2/9	Lecture 12: Manometers and Airspeed Measurements
13	W	2/11	Lecture 13: Examples
14	F	2/13	**Exam 1**
15	M	2/16	Lecture 13: Circulation, Stream Function, Velocity Potential
16	W	2/18	Lecture 14: Elementary Solutions to Laplace's Equation
17	F	2/20	Lecture 15: Elementary Solutions Part 2
18	M	2/23	Lecture 16: Lifting Flow over Cylinders
19	W	2/25	Lecture 17: Examples
20	F	2/27	Lecture 17: Examples
21	M	3/2	Lecture 18: Viscous Flow Introduction
22	W	3/4	Lecture 19: Exact Solutions to NS Equations
23	F	3/6	Lecture 20: Boundary Layer Falkner-Skan Solution
	M	3/9	Lecture 21: Incompressible Boundary Layers
24	W	3/11	Lecture 22: Incompressible Boundary Layers Continued
25	F	3/13	**Exam 2**
	M	3/16	Spring Break
	W	3/18	Spring Break
	F	3/20	Spring Break
26	M	3/23	Lecture 23: Introduction to Airfoils
27	W	3/25	Lecture 24: Thin Airfoil Theory
28	F	3/27	Lecture 25: Symmetric Thin Airfoils, Moment Coefficient, Center of Pressure
29	M	3/30	Lecture 26: Cambered Airfoil
30	W	4/1	Lecture 27: Examples and Biot-Savat Law
31	F	4/3	Lecture 28: Wings - Lifting Line Theory
32	M	4/6	Lecture 29: General Lift Distribution
33	W	4/8	Lecture 30: Example Lifting Line Theory
34	F	4/10	Lecture 31: Elliptic Wings
35	M	4/13	**Exam 3**
36	W	4/15	Lecture 33: Panel Methods and Intro to xflr5
37	F	4/17	Lecture 34: Project Overview
38	M	4/20	Lecture 35: Project Question and Answer Period
39	W	4/22	Lecture 36: Project Question and Answer Period, Project Due 11:59 pm
			No Final Exam