

AE 6520 Advanced Flight Dynamics Fall 2007

<http://www.ae.gatech.edu/~ejohnson/ae6520-fall2007>

Instructor: Dr. Johnson
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Office hours: MWF, 1:00pm – 2:00pm, or by appointment
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Class: ESM 210
MWF, 2:05pm – 2:55pm

Topics:

1. Definitions, reference frames, and transformations
2. General equations of unsteady motion
3. Applications to fixed-wing, rotary-wing, and space vehicles
4. Small disturbance theory
5. Static stability
6. Dynamic stability
7. Flight in atmospheric turbulence
8. Coupled and nonlinear behaviors

Grading: Homework 50%, Midterm 15%, and Final 35%

Policies: Students are encouraged to discuss homework *verbally* with each other, but you may not work together when preparing written answers – nor may written answers be compared. When homework is turned in that looks too similar, *points will be deducted*. Homework is due at the *beginning* of class on the day it is due. Late homework will normally be graded, but will not necessarily receive any points.

Selected References:

1. (class text) Etkin, Bernard, *Dynamics of Atmospheric Flight*, John Wiley & Sons and now Dover, Inc., 1972.
2. Stevens, Brian and Lewis, Frank, *Aircraft Control and Simulation*, John Wiley & Sons, Inc., 1992, 2nd Edition 2003.
3. Thompson, William, *Introduction to Space Dynamics*, Dover, 1986.
4. Etkin, Bernard, *Dynamics of Flight Stability and Control*, 3rd Edition. John Wiley & Sons, Inc., 1996.
5. Wiesel, William, *Spaceflight Dynamics*, 2nd Edition, McGraw-Hill Book Co., 1997.
6. Nelson, Robert, *Flight Stability and Automatic Control*, McGraw-Hill Book Co., 1989.
7. Abzug, Malcom and Larrabee, Eugene, *Airplane Stability and Control: A History of the Technologies That Made Aviation Possible*, Cambridge University Press, 1997.