14:650:471 Aircraft Flight Dynamics

Part 1: Course Information

Instructor Information

Instructor: Laurent Burlion, Ph.D., Assistant Professor
E-mail: laurent.burlion@rutgers.edu

Course Learning Outcomes/Assessment Tools:

Course Learning Outcomes	Assessment Tools
1. Provide a conceptual framework for quantitative analysis of an aircraft motion.	HW, Exams, Group project
2. Introduce technical, professional, and ethical challenges of engineering endeavors through success and failure case studies	Class discussion
3. Develop an environment for active learning leading to mastering the concepts of aircraft static / dynamic stability, flying qualities, and control.	HW, Exams, Group project

Course Description

The goal of this course is to develop an understanding of the fundamentals of the dynamics and control of aircraft with emphasis on conventional airplane performance and stability, both static and dynamic. The topics to be covered include:

(i)Basic Concepts,

(ii)Aircraft Static Stability and Control,

(iii)Aircraft Equations of Motion,

(iv)Aircraft Longitude Motion,

(v)Aircraft Lateral Motion.

Prerequisite

- (14:440:222 Engineering Mech. or 14:440:292 Honors Eng. Mech.-Dyna) and (01:640:421 Adv. Calc. for Engineering).

Textbook & Course Materials

Required Text

"*Flight Stability and Automatic Control*" by Robert Nelson, McGraw-Hill Science, 1997.

Recommended Texts & Other Readings

- "Flight Dynamics," by Robert F. Stengel, Princeton University Press, 2nd edition, 2022.
- "*Introduction to Aircraft Flight Mechanics: Performance, Static Stability, Dynamic Stability, Classic,"* by Thomas R. Yechout, AIAA Educational series, 2014.

  "*Stick and rudder,*" by Wolfgang Langewiesche, McGraw-Hill Education, 1990.