

The Hong Kong University of Science and Technology

Aircraft Performance and Stability

MECH3670

3 Credits

Pre-/co-requisites: CENG2220 or CIVL2510 or MECH1907 or MECH2020 or MECH2210

Name: Prof. S. REDONNET

Email: redonnet@ust.hk

Office Hours: Anytime, upon request / Room 2577F

Course Description

The flying capacity of an airborne vehicle depends on its performance and stability qualities, which are driven by the way its overall design can fit with flight dynamics constraints. This course provides an introduction to flight dynamics, with emphasis on aircraft performance and stability. To do so, the course introduces the fundamentals of flight dynamics, focusing more especially on the key concepts pertaining to flight performance and stability. The course then covers the methodological tools (fundamental theories and mathematical models) that are commonly used for analyzing the performance and stability characteristics of aircraft. Finally, the course illustrates how these theoretical and methodological knowledge are used across aerospace industries for the safety and efficiency of aircraft can be maximized.

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Class attendance (and attention)	5%
Mid-Term	15%
Group Project	35%
Final examination	45%

Grading Rubrics

Rubrics will be provided and/or discussed in class for each assignment, if any. These rubrics will outline the criteria used for evaluation. Students can refer to these rubrics to understand how their work will be assessed.

Required Texts and Materials

1. Textbook: Yechout et al., « Introduction to aircraft flight mechanics », AIAA Education Series, 2003
2. Lectures material

Additional Resources

Other recommended references

- Cook, M. V. « Flight Dynamics Principles », 2nd ed. Elsevier, 2007
- Stengel, R. F., « Flight Dynamics », Princeton University Press, 2004