The Hong Kong University of Science and Technology

Aircraft Performance and Stability / MECH3670 (3 Credits)

Pre-/co-requisites: MECH1907 and/or MECH2020 and/or MECH2210

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Course Description

The flying and handling qualities of an airborne vehicle depend on its performance and stability characteristics, which are both driven by its design orientations. This course covers the fundamentals of flight dynamics, which are approached from both a phenomenological and a methodological viewpoint. In particular, the course introduces students to the theories and mathematical frameworks that are commonly used for assessing the performance and stability of an aircraft. These aspects are then illustrated through practical examples and cases studies.

Assessments

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

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Group project	ILOs 1 to 5	This task assesses the students' ability to demonstrate their mastery of the theoretical knowledge (ILO1) and practical tools (ILO2) pertaining to aircraft performance and stability, thereby proving their capacity to assess how efficient an aircraft can be (ILO3, ILO4) whilst working as a team (ILO5).
Midterm and Final examinations	ILOs 1-4	This task assesses the students' ability to demonstrate their mastery of the theoretical knowledge (ILO1) and practical tools (ILO2) pertaining to aircraft performance and stability, thereby proving their capacity to assess how efficient an aircraft can be (ILO3, ILO4).

Required Texts and Materials

1. Lectures material

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

Other recommended references

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