Syllabus for

PhD course: Aerospace Actuators

CREDITS	5.0 credits
LECTURER	Jean-Charles Maré, Professor at the National Institute of Applied Sciences (INSA), and researcher at the Clément Ader Institute in Toulouse, France.
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TARGET GROUP	PhD students interested in on-board aircraft systems.
PREREQUISITES	Basic background in engineering. Experiences in Matlab/Simulink is advantageous but not required.
AIM	The course is aimed to actuator technology for aerospace applications. E.g. actuator for actuation for primary and secondary control surfaces, landing gears and other miscellaneous functions.
LEARNING OUTCOMES	After the course, the student shall demonstrate skill and ability in: • Understanding of the different actuator concepts • Modeling and simulation of different actuators

CONTENTS	• Actuation in aerospace, 3h
	• Architecting safety critical fluid power transmission systems, 6h
	  ○ Case study: comparative analysis of BA609 and V22 pylon conversion actuators
	• Towards more/all electric actuation in aerospace. 8h
	  ○ Signal-by-Wire / Power-by-Wire, architectures, principle of operation, and specific challenges of electric drives
	• Process and best practices for lumped parameters modelling and simulation. 3h

- Modelling and simulation of electromechanical actuators, 6h
  - Including power electronics, motor, mechanical transmission, with fault injection and illustration on AMESim and Matlab Simulink)

ORGANISATION	Lectures, assignments.
LITERATURE	TBD
EXAMINATION	The main examination task is assignments. The grade is passed/not passed.
ORGANISATION	Lectures, exercises and assignment.
SCHEDULE	Schedule is preliminary may be subject to change Monday Jan 27 8:15-15:00 6h Tuesday Jan 28 8:15-15:00 6h Wednesday Jan 29 8:15-15:00 6h Thursday Jan 30 8:15-15:00 6h Friday Jan 31 8:15-15:00 6h Project presentation TBD