

COURSE INFORMATION “AIRCRAFT ENGINES“

 summer semester 2017	 Stud.IP	 English	 3 SWS
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Description

Participants in this unit *Massive Open Online Course (MOOC) “Aircraft Engines”* will be taught the technological aspects of aircraft engines, their design, and operation. Additionally, economical parameters and legal issues of approval will be introduced. Based on the flight mission analysis and other constraints, the methodology and objective of engine design will be illustrated taking into account component matching and aircraft integration. Furthermore, unit participants will learn to estimate the technological potential of advanced propulsion concepts.

The unit is given by TU9 researchers Prof. Jens Friedrichs (Head of the Institute of Jet Propulsion and Turbomachinery, Technische Universität Braunschweig) and Dr. Florian Herbst (Post-doctoral researcher and head of the Numerical Methods group at the Institute of Turbomachinery and Fluid Dynamics, Leibniz Universität Hannover).

Unit content

Chapter 1	Thrust and thermodynamics
Chapter 2	Efficiency, fuel consumption, and range
Chapter 3	Classification of aircraft engines
Chapter 4.1	Aircraft engine components: inlet, fan and compressor
Chapter 4.2	Aircraft engine components: combustor
Chapter 4.3	Aircraft engine components: turbine
Chapter 4.4	Aircraft engine components: nozzle and cooling
Chapter 5	Performance and design parameters
Chapter 6	Aeroacoustics of jet engines
Chapter 7	Legal requirements of approval

for further chapters please see next page

Unit content

Chapter 8.1	Innovative concepts (e.g. open rotor, electrical propulsion)
Chapter 8.2	Innovation in gas turbine engine cycles (e.g. recuperative heat exchangers and alternative fuels)
	Exam

Pre-requisites

A bachelor's degree in mechanical engineering (or comparable programmes) and particularly an understanding of thermodynamics and fluid mechanics are pre-requisites to this unit. Previous knowledge in the basics of turbomachinery is strongly recommended.

Acquirement of credit points

A certificate of attendance can be issued to all successful participants.

Students enrolled in selected programmes at TU Braunschweig or Leibniz Universität Hannover may integrate this unit in their regular programmes. The examination regulations of the respective university apply.

Any students enrolled at a German university may take the written exam at the end of the unit in Hannover or Braunschweig. In case of a successful examination 5 ECTS are awarded. Please refer to local examination regulations of the respective universities and programmes for further information.

Further questions

For further questions related to the MOOC "Aircraft Engines" please contact k.sivarmoorthy@ifas.tu-bs.de.