

# Courses in English

## Course Description

<b>Department</b>	03 Mechanical, Automotive and Aeronautical Engineering
<b>Course title</b>	<b>Aerospace Control Systems</b>
<b>Hours per week (SWS)</b>	6
<b>Number of ECTS credits</b>	6
<b>Course objective</b>	The students will be proficient in the modeling, analysis, and control of dynamical systems with a special emphasis on aerospace and automotive applications. They will understand classical linear control theory and will have an insight to the basics of state space theory. Applications with respect to the design of open and closed loop systems will be performed in a laboratory environment. The students will be capable of using modern tools like MATLAB and SIMULINK for control system design purposes.
<b>Prerequisites</b>	
<b>Recommended reading</b>	"Control Systems Engineering (6th edition)", by Norman S. Nise, John Wiley & Son "Modern Control Systems" , by Dorf, Bishop; Pearson, Prentice Hall "Aircraft Control and Simulation", by Brian L. Stevens and Frank L. Lewis, Wiley Videos, Skript und Übungsaufgaben auf Moodle
<b>Teaching methods</b>	Seminaristischer Unterricht
<b>Assessment methods</b>	Prüfung gemäß Studien- und Prüfungsordnung
<b>Language of instruction</b>	English
<b>Name of lecturer</b>	Prof. Daniel Ossmann
<b>Email</b>	<a href="mailto:daniel.ossmann@hm.edu">daniel.ossmann@hm.edu</a>
<b>Link</b>	
<b>Course content</b>	<ul style="list-style-type: none"><li>• Introduction into control systems. (Open Loop vs. Closed Loop)</li><li>• Mathematical description of dynamical (electro-mechanical) systems with differential equations. Linearization, solution techniques, Laplace transforms, concept of transfer-functions, modeling of automotive and aeronautical systems</li><li>• First and second order systems, definition of requirements</li><li>• Root-Locus techniques</li><li>• Transient and steady state behavior</li><li>• Stability</li><li>• Frequency response and Nyquist criterion</li><li>• Design of closed loop control systems</li><li>• MATLAB/SIMULINK</li></ul>
<b>Remarks</b>	