# Simulation of Flight Dynamics and Airplane Operation with MatLab-Simulink

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| Course number | 5670 |
| Hours per week: | 4 |
| ECTS: | 5 |
| Scheduled: | Summer Term |
| Format: | Seminar / Practical course |
| Examination: | Presentation and oral exam |
| Lecturer: | Prof. Dr. -Ing. Alexander Czinki |
| Objectives: | The class provides the participants with the ability to: <br> apply and operate Matlab-Simulink such that they can build models of sophisticated technical systems. <br> Students learn major basics of flight dynamics and aircraft operation and how to model them in MatLab-Simulink. <br> Students will also elaborate and hold a presentation on specific flight-related-engineering problems. |
| Contents: | Introduction to Simulink (basic and advanced functionalities) <br> Airplane systems and airplane design basics <br> Weight, balance and aerodynamic stability <br> Aerodynamic Forces and Moments <br> Controls for Pitch, Roll and Yaw <br> Aircraft equations of motion - Translation and rotation <br> Aircraft performance: Cruising flight <br> Aircraft performance: Gliding and climbing <br> Aircraft performance: Extreme flight conditions <br> Radio navigation and avionics <br> Air traffic and air traffic control <br> Flight-, crew- and team-management in aviation |
| Pre-requisites | Basic Knowledge of Mathematics and Physics |
| Recommended Reading: | Mechanics of Flight, R. H. Barnard, A. C. Kermode Pearson Education Limited (2012) |