Module name	**Literature Studies on Software Methods and Technologies for Virtual Aircraft**
Module number	CMS-SEM-SP
Senior Lecturer	Prof. Dr. Sabine Roller sabine.roller@tu-dresden.de
Qualification objectives	Students will be able to analyse and discuss scientific publications on a topic related to software methods and technologies for the Virtual Aircraft. They are able to produce the content of the publications independently and to present the results of their literature studies in a comprehensive way.
Contents	The module will analyse and discuss scientific publications on a topic chosen by the student in the fields of Computational Fluid Dynamics, Computational Mathematics, Computational Engineering or High Performance Computing.
Forms of teaching and learning	The module includes seminars of 2 SWS and self-study. The language of the seminars will be English.
Eligibility for participation	No knowledge is required.
Usability	In the Masters Course Computational Modeling and Simulation, the module is a compulsory optional module of basic scientific methodological training, to be chosen in accordance with Annex 1 to the Specific Examination Regulations. The module cannot be chosen in the Master's Course Computational Modeling and Simulation if this or a module with substantially the same content from a Course with which the entry conditions under § 3 of the Studienordnung have been met has already been completed. The module provides the pre-requisites for the modules it designates under the pre-requisites for participation.
Conditions for the award of credits	Credits are awarded when the module test is passed. The module test consists of a non-public oral test performance as an individual test lasting 30 minutes. The language of the test will be English.
Credits and marks	The module allows for 3 credit points. The module score corresponds to the test performance score.
Frequency of the module	The module is offered every summer semester.
Workload	The total workload is 90 hours.
Duration of the module	The module covers 1 semester.
Module name	**Digital Circuit Design**
Module number	CMS-TRK-DCD

Senior Lecturer	Prof. Dr. Christian Georg Mayr christian.mayr@tu-dresden.de
Qualification objectives	Students are familiar with the functioning and basic design principles of digital circuits. Based on knowledge of active semiconductor component models, they are familiar with the systematic design and analysis of digital and mixed signal base circuits. They understand the architecture and system concepts of complex digital systems and are aware of interconnectivity specificities in nanoscale CMOS technologies, loss reduction methods, measures to increase processing speed in high-speed circuits and interfaces, and the consideration of statistical influences of manufacturing technologies.
Contents	The content of the module shall include analysis, dimensioning and optimisation of basic digital combinatorial and sequential elements based on current semiconductor technologies, such as CMOS, BiCMOS, design of complex logic functions in the form of arithmetic-logical circuits, such as alus, shifters and multiplicators, condition machines or Finite State Machines, tilting and oscillator circuits, digital architecture and system concepts, such as register-transfer logic, memory architectures, in particular DRAMs, SRAMs, EPROMs and mixed-signalling circuits, such as ADCs, DACs, Interfaces, and methodology for designing complex digital and mixed-signalling systems, such as behavioural description, optimisation, validation.
Forms of teaching and learning	The module includes lectures of 2 SWS, exercises of 2 SWS and self-study. The language of the lectures and exercises will be English.
Eligibility for participation	Basic knowledge of electrical engineering, systems theory and mathematics at bachelor's level is required.
Usability	The module is a mandatory module in Track Applied Artificial Intelligence in the Masters Course Computational Modeling and Simulation. The module provides the pre-requisites for the modules it designates under the pre-requisites for participation.
Conditions for the award of credits	Credits are awarded when the module test is passed. The module test consists of a 120-minute away day. The language of the test will be English.
Credits and marks	The module allows 5 credit points to be obtained. The module score corresponds to the test performance score.
Frequency of the module	The module is offered every winter semester.
Workload	The total workload is 150 hours.
Duration of the module	The module covers 1 semester.