Module name	**Literature Studies in Deep Learning for Applied Image Analysis**
Module number	CMS-SEM-DLAIA
Senior Lecturer	Prof. Dr. Martin Weigert martin.weigert@tu-dresden.de
Qualification objectives	Students can independently integrate into up-to-date deep learning methods for image analysis, in particular with applications in biomedical imaging. They are able to understand up-to-date scientific publications in this field, to present their key concepts and research results in English in an understandable way and to discuss questions in an informed manner.
Contents	The module includes up-to-date deep learning methods for image analysis, including image classification, object detection and segmentation, object tracking, and generative models. Other content includes basic model architectures such as Convolutional Neural Networks (CNNs), transformers and diffusion models.
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	Basic skills in linear algebra, computer programming and bachelor-level machine learning are 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 complex performance of 50 hours. 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.