Module name	**Image Analysis and Machine Learning in Environmental Remote Sensing**
Module number	CMS-TRK-ED2
Senior Lecturer	Prof. Dr. Matthias Forkel matthias.forkel@tu-dresden.de
Qualification objectives	Students are familiar with methods of multivariate analysis of optical and microwave remote sensing data to map land cover. They are able to describe, apply and critically assess methods of image analysis, unsupervised and supervised classification, machine learning, and deep learning, as well as to use and adapt appropriate programming languages and software packages.
Contents	The content of the module shall include the processing and correction of multispectral and radar satellite data, filtering, image transformation, feature reduction and texture for feature extraction and selection, as well as machine learning methods and deep neural land cover classification networks using supervised and unsupervised approaches and accuracy analysis.
Forms of teaching and learning	The module includes lectures of 2 SWS, exercises of 1 SWS and self-study. The teaching language of lectures and exercises may be German or English and will be specifically determined by the teacher at the beginning of each semester and announced in the usual manner.
Eligibility for participation	Basic knowledge of remote sensing and analysis of satellite images and knowledge of how to use a script-based programming language at bachelor's level as well as the skills to be acquired in the module CMS-TRK-ES4 Environmental and Climate Remote Sensing are required.
Usability	In the Masters Course Computational Modeling and Simulation, the module is an optional module in the Track Computational Environmental Science and Engineering, to be selected in accordance with Annex 2 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 20 minutes. The language of the test will be English or German, at the choice of the speaker of the study.
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 summer semester.
Workload	The total workload is 150 hours.
Duration of the module	The module covers 1 semester.