

Only the german version of the module description as part of the study regulations is legally binding.

Module name	Foundations of Data Visualization
Module number	INF-25-Ma-FVC-FDV
Responsible lecturer	Prof. Dr. Stefan Gumhold stefan.gumhold@tu-dresden.de
Qualification objectives	Students master the basics and practices of scientific visualization of measurement and experiment data as well as simulation results. They know the basics of visual perception and its influence on the design of visualizations. Students can safely specify data by dimension, feature types, and structure, and select appropriate visual attributes for a given specification. They know the most important forms of visualization for two-, three- and multidimensional observation spaces as well as for scalar, vectorial, tensor-valued and multidimensional characteristics. They are able to select suitable techniques for the respective visualization task. Students are familiar with basic presentation and interaction techniques and can fundamentally implement them in an interactive visual analysis system. They know the most important visualization frameworks, have practical experience and are able to select visualization frameworks appropriately for their tasks.
contents	Contents of the module are the basics of data visualization, with regard to the representation of data of different types on visual attributes and the insights about the visual perception of humans.
Forms of teaching and learning	The module includes lectures in the scope of 2 SWS, exercises in the scope of 2 SWS and self-study. The teaching language of the lectures and exercises is English.
Requirements for participation	The competences to be acquired in the modules INF-25-Ba-Prg Programming and RoboLab, INF-25-Ba-AuD Algorithms and Data Structures as well as INF-25-Ba-Ma1 Linear Algebra and Analysis are required in the Diploma Programme in Computer Science, the Bachelor Programme in Computer Science and the Bachelor Programme in Applied Computer Science. The Master's programme in Computer Science and the Master's programme in Media Informatics require knowledge of sequential computer programming, algorithms and data structures, analysis of functions of one and more variables, basic techniques of data analysis as well as linear algebra, in particular vector and matrices calculation at bachelor level.
usability	The module is a compulsory elective module in the field of Visual Computing and Machine Learning in the diploma course Computer Science in the main course of study, which must be chosen in accordance with Annex 2 to the examination regulations. In the Bachelor's programme in Computer Science, the module is a compulsory elective module of specialisation, which must be chosen in accordance with the annex to the examination regulations. The module in the Bachelor's

	programme in Applied Computer Science is a compulsory elective module in the specialisation in Media Informatics and in the specialisation in Medical Informatics, which must be chosen in accordance with the annex to the examination regulations. The module in the Master's programme Computer Science is a compulsory elective module in the Open Track in the field of Visual Computing and Machine Learning as well as the supplement, which must be selected in accordance with Annex 2 to the examination regulations. The module can only be selected once in the Master's programme Computer Science. In the Master's programme in Media Informatics, the module is a compulsory elective module in the field of specialisation modules, which must be chosen in accordance with Section 27(3) of the Examination Regulations. The module cannot be selected in the Master's degree program Computer Science and the Master's degree program Media Informatics if this or a substantially identical module from a degree program with which the admission requirements according to § 3 of the study regulations have been fulfilled, has already been completed. The module creates the prerequisites for the modules, which it names under prerequisites for participation.
Conditions for awarding credits	The credit points are earned when the module examination has been passed. The module exam consists of a 90-minute exam. The language of the examination can be German or English and will be specified by the lecturer at the beginning of each semester and announced in the usual manner.
Credits and grades	6 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the module	The module is offered every winter semester.
workload	The total workload is 180 hours.
Duration of the module	The module covers one semester.