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| Module level Master | Credit points 6 | Language English | Return annual |
| Module designation | | | |
| Practice of Different Software Tools | | | |
| Course(s) | | | |
| 1. Object-oriented Programming with C-/C++ | | | |
| 2. Application of MATLAB | | | |
| 3. Application of OpenFoam (CFD) | | | |
| 4. Application of MATLAB finite element software | | | |
| Code | Subtitle | | |
| Person responsible for the module | Prof. Dr.-Ing. Sigrid Wenzel | | |
| Lecturer | 1. Prof. Dr.-Ing. Sigrid Wenzel 2. Prof. Dr. Andreas Meister 3. Prof. Dr.-Ing. Olaf Wunsch 4. Prof. Dr. Detlef Kuhl | | |
| Workload | Workload: 1. 45 h (5 h online presentation, 10 h private study, 30 h home work) 2. 45 h (5 h online presentation, 10 h private study, 30 h home work) 3. 45 h (5 h online presentation, 10 h private study, 30 h exercise) 4. 45 h (5 h online presentation, 10 h private study, 30 h home work) | | |
| Relation to curriculum | Basic studies, compulsory optional subject | | |
| Type of teaching, contact hours | Skype, virtual classrooms, online presentation, online transmission. | | |
| Requirements according to examination regulations | None | | |
| Recommended prerequisites None | | | |
| Module objective / intended learning outcomes | | | |
| <p>The students should be able to design and implement structured programs using the object-oriented paradigm and know how to apply different simulation programs. The students have the ability to apply MATLAB to distinguish mathematical problems as well as the finite volume software OpenFoam in order to simulate fluid flows in technical apparatus. Additionally, the students have the ability to apply a semi-commercial finite element software to simulate structural components of wind power plants and to transfer their knowledge to classical commercial finite element packages as e.g. Abaqus, ANSYS, Nastran. In particular, geometrical modeling, meshing, static and dynamic analyses and the interpretation of the results are familiar to the students.</p> | | | |
| Content | | | |
| 1. Object-oriented Programming with C-/C++ Introduction in the OO-paradigm, data structures and methods, recursive functions, programming example. 2. Application of MATLAB Introduction in MATLAB, numerical solution of large linear systems, post processing 3. Application of OpenFoam Introduction in OpenFoam, discretization of basic geometries and mesh generation, handling of OpenFoam, examples of fluid flow simulations 4. Application of MATLAB finite element software | | | |

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| Introduction to mesh generation, linear static and dynamic structural analyses, post-processing, simulation of wind power plants components | |
| Study and examination requirements and forms of examination | multiple choice test (30 min) (course 3) written homework (25 pages) (course 1, 2 and 4) |
| Media employed | online script |
| Reading list Reading list will be provided by lecturer via Moodle online platform. | |