

Computational Fracture Mechanics					
Module-No./Abbreviation	Credits	Workload	Term	Frequency	Duration
CE-WP19/CFM	6 CP	180 h	3 rd Sem.	Winter term	1 Semester
Courses Computational Fracture Mechanics			Contact hours 4 SWS (60 h)	Self-Study 120 h	Group Size: No Restrictions
Prerequisites -					
Learning goals / Competences After successfully completing the module, the students <ul style="list-style-type: none"> remember the different types of brittle fracture and ductile failure of materials, understand the theoretical background of the different types of fracture models, are able to study the relevant literature independently, are able to choose appropriate fracture models and to implement them in a finite element environment, are able to independently simulate fracture including plasticity for a wide range of materials and geometries, can assess situations where cracks in a structure or component can be tolerated or situations in which cracks are not admissible. 					
Content <ul style="list-style-type: none"> Phenomenology and atomistic aspects of fracture Concepts of linear elastic fracture mechanics Concepts of elastic-plastic fracture mechanics R curve behavior of materials Concepts of cohesive zones (CZ), extended finite elements (XFEM) and damage mechanics Finite element based fracture simulations for static and dynamic cracks Application to brittle fracture & ductile failure for different geometries and loading situations 					
Teaching methods / Language Lecture (2h / week), Exercises (2h / week) / Homework (60h) / English					
Mode of assessment Written examination (120 min, 100%), bonus points for homework					
Requirement for the award of credit points Passed final module examination and passed homework					
Module applicability MSc. Computational Engineering, MSc. Maschinenbau, MSc. Materials Science and Simulation					
Weight of the mark for the final score 6 %					
Module coordinator and lecturer(s) Prof. Dr. rer. nat. A. Hartmaier, Assistants					
Further information					