

Materials for Aerospace Applications					
Module-No./Abbreviation	Credits	Workload	Term	Frequency	Duration
CE-WP20/MAA	6 CP	180 h	3 rd Sem.	Winter term	1 Semester
Courses Materials for Aerospace Applications			Contact hours 4 SWS (60 h)	Self-Study 120 h	Group Size: No Restrictions
Prerequisites -					
Learning goals / Competences After successful completion of the module, students can <ul style="list-style-type: none"> recapitulate which high performance material systems are used for aerospace applications, how they are manufactured, and which microscopic mechanisms control their properties, explain and apply procedures for selecting and developing material systems for aerospace components, considering the specific requirements, decide which characterization and test methods to apply for qualifying materials and joints for aerospace applications and know how lifetime assessment concepts work, communicate, using technical terms in the field of aerospace engineering in English. 					
Content The substantial requirements on materials for aerospace applications are „light and reliable“, which have to be fulfilled in most cases under extreme service conditions. Therefore, specifically designed materials and material systems are in use. Furthermore, joining technologies play an important role for the weight reduction and reliability of the components. Manufacturing technologies and characterization methods for qualifying materials and joints for aerospace applications will be discussed. Topics are: <ul style="list-style-type: none"> Loading conditions for components of air-and spacecrafts (structures and engines) Selecting and developing materials and material systems for service conditions in aerospace applications (e.g. for aero-engines, rocket engines, thermal protection shields for reentry vehicles, light weight structures for airframes, wings, and satellites) Degradation & damage mechanisms of aerospace material systems under service conditions Characterization and testing methods for materials and joints for aerospace applications Concepts and methods for lifetime assessment 					
Teaching methods / Language Lecture (3h / week), Exercises (1h / week) / English					
Mode of assessment Written examination (120 min, exceptions approved by examination office: oral exam/ 30 min)					
Requirement for the award of credit points Passed final module examination					
Module applicability MSc. Computational Engineering, MSc. Maschinenbau					
Weight of the mark for the final score 6 %					
Module coordinator and lecturer(s) Prof. Dr. rer. nat. K. Hackl, Prof. Dr.-Ing. M. Bartsch, Assistants					
Further information <ul style="list-style-type: none"> Recommended are basics in materials science and solid mechanics Script in English, additional literature announced during lecture 					