Courses in English
Course Description

Department 03 Mechanical, Automotive and Aeronautical Engineering

Course title Composite Materials, Mechanics and Construction

Hours per week (SWS) 4

Number of ECTS credits 5

Course objective The purpose of this module is to deliver to the student the necessary engineering competencies to be able to apply composite materials. After taking this unit the student should be able to:
- Understanding of fibre design and orientation, fibre preforms and textiles
- Calculate stiffness, stresses and strains in composite materials (laminate theory)
- Predict failure and safety factors-Design and calculation of load introduction elements
- Analysis of damages, knowledge of damage tolerance principal
Knowledge about fundamental manufacturing methods

Prerequisites Chemistry, Polymer technique, Engineering Mechanics


Teaching methods Course lecture

Assessment methods Exam according to the legal framework of the degree program in which this course is offered. Approved aides for the examination will be published by means of the examination announcement.

Language of instruction English

Name of lecturer Prof. Dr. Alexander Horoschenkoff

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Link

Course content Material and calculation aspects:
Material characteristics and their experimental determination, laminate theory and failure calculation (Tsai Wu and Puck), interlaminar and intralaminar stresses, fibre types and properties, semi finish products (non crimp fabric, prepreg etc.), damage and failure analysis (micro-crack, fibre breakage, delamination)
Design aspects and structural mechanics:
Design and calculation of girders and beams, leaf springs and vessels
Principal manufacturing methods:
Prepreg and autoclave manufacturing method, high pressure RTM, winding

Remarks