

Modulname	<b>PI Numerical Heat Transfer Simulation</b>
Modulverantwortlicher/ Modulverantwortliche	Prof. Dr. Robert Pietzsch
Qualifikationsziele	In completion of this subject, the students should be able to calculate independently temperature fields in simple technical structures. They should know the terms and physical quantities of the theory of heat transfer and they should be able to apply them. The thermal calculation environment of the ANSYS program should be mastered safely. One important competence is to select the right finite element type for a given application and to understand the different properties and degrees of shape functions. During the examination (120min) the students should demonstrate their skills to solve two heat transfer problems using ANSYS.
Modulinhalte	<p>Topics:</p> <p>(I) laws and terms of heat transfer, balance equation of internal thermal energy</p> <p>(II) manual calculation of temperature fields and simple heat transfer problems</p> <p>(III) fundamentals of the Finite Elements Method, elements formulation, shape functions, time integration methods, Introduction in ANSYS environment</p> <p>(IV) simple cooling behaviour of a compact body</p> <p>(V) steady linear heat conduction in a straight rod</p> <p>(VI) transient heat conduction in a cooled rod</p> <p>(VII) thermal contact of two slabs at the face side (contact temperature)</p> <p>(VIII) transient heat exchange and temperature equalization in a plane structure</p> <p>(IX) steady heat conduction and heat transfer capacity of a flat fin</p> <p>(X) thermomechanical coupling of structural and thermal calculations, Calculation of thermal strains and stresses, thermal distortion</p> <p>(XI) axisymmetric problems, considered in a cross section area</p> <p>(XII) heat conduction in volumetric bodies</p>
Lehrformen	Übung (4 SWS)
Voraussetzungen für die Teilnahme	fundamentals of thermodynamics and heat transfer
Literatur/multimediale Lehr- und Lernprogramme	<p>Supporting documents: scriptum with solved and explained examples</p> <p>Recommended publications: ANSYS theory manual and elements documentation</p>
Lehrbriefautor	keiner

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Verwendbarkeit	Pool International (English Lectures for Contact students) F MB PI	
Arbeitsaufwand/Gesamtworkload	Präsenzzeit 60 h + Vorbereitung 90 h = 150 Stunden = 5.0 Credit Punkte	
ECTS und Gewichtung der Note in der Gesamtnote	5.00	1
Leistungsnachweis	practical examination at the computer: 120min	
Semester	2 Fachsemester	
Häufigkeit des Angebots	annually in the summer semester	
Dauer	1 Semester	
Art der Lehrveranstaltung	anually in summer semester	
Besonderes		

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