TÜRK-ALMAN ÜNİVERSİTESİ
TÜRKISCH-DEUTSCHE UNIVERSITÄT

DEPARTMENT OF MATERIALS SCIENCE AND TECHOLOGY
COURSE SYLLABUS

Course Details						
Code			**Academic Year**		**Semester**	
MWT408			3		6	
Title			**T**	**A**	**L**	**ECTS**
Advanced Characterization Techniques of Materials			2	1	1	6

Language	German					
Level	**Undergraduate**	X	**Graduate**		**Postgraduate**	
Department / Program	Materials Science and Technology					
Forms of Teaching and Learning	Face to face					
Course Type	**Compulsory**		**Elective**		X	
Objectives	The students learn the fundamentals of advanced materials characterization methods. They develop the understanding of determining proper characterization method according to appropriate materials. These methods are used to understand the relationship between structure and properties, as well as surface properties and performance of the materials.					
Content	X-ray diffraction; Investigation of crystal structure, phase analysis and elemental analysis, fundamentals of electron microscopy; Scanning Electron Microscope (SEM), Transmission Electron Microscopy (TEM), Diffraction Pattern, Sample Preparation for TEM, X-ray Photoelectron Spectroscopy (XPS), Auger Electron Microscopy (AES), Secondary Ion Mass Spectrometry (SIMS), Atomic Force Microscopy (AFM), Scanning Tunneling Microscopy (STM)					
Prerequisites						
Coordinator						
Lecturer(s)	Asist. Prof.Dr. Duygu Ekinci					
Assistant(s)						
Work Placement	No					
Recommended or Required Reading						
Books / Lecture Notes	C.Kittel: „Einführung in die Festkörperphysik", Oldenbourg-Verlag (2006); C. Kittel, "Introduction to Solid State Physics", Wiley, New York (2005)					
Other Sources						
Additional Course Material						
Documents						
Assignments						
Exams						
Course Composition						
Mathematics und Basic Sciences			%			

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Engineering		100%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge		%

Assessment		
Activity	**Count**	**Percentage (%)**
Midterm Exam	1	40
Quiz		
Assignments		
Attendance		
Recitations		
Projects		
Final Exam	1	60
Total		**100**

ECTS Points and Work Load			
Activity	**Count**	**Duration**	**Work Load (Hours)**
Lectures	15	2	30
Self-Study	10	10	100
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	15	1	1
Laboratory	15	2	30
Projects			
Final Exam	1	2	2
Total Work Load			**179**
ECTS Points (Total Work Load / Hours)			**6**

Learning Outcomes	
1	The students learn the fundamentals of advanced materials characterization methods.
2	
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Weekly Content

1	Metallographic study of the transformation behavior of steel
2	Preparation and characterization of CdTe thin-film solar cells
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Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
All		2	3				
1							
2							
3							
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10							
11							
12							
Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High						
Compiled by:							
Date of Compilation:							