

DEPARTMENT OF MATERIALS SCIENCE AND TECHNOLOGY  
COURSE SYLLABUS

Course Details					
<b>Code</b>				<b>Academic Year</b>	<b>Semester</b>
NWI401				4	Winter
<b>Title</b>	<b>T</b>	<b>A</b>	<b>L</b>	<b>ECTS</b>	
Scientific Research Methods	2	-	-	2	
<b>Language</b>	German				
<b>Level</b>	<b>Undergraduate</b>	X	<b>Graduate</b>		<b>Postgraduate</b>
<b>Department / Program</b>	Materials Science and Technology				
<b>Forms of Teaching and Learning</b>	Face to Face				
<b>Course Type</b>	<b>Compulsory</b>	X	<b>Elective</b>		
<b>Objectives</b>	<p>At the end of this course, the students should be able to</p> <ul style="list-style-type: none"> <li>• understand some basic concepts of research and its methodologies</li> <li>• identify appropriate research topics</li> <li>• select and define appropriate research problem and parameters</li> <li>• prepare a project proposal (to undertake a project)</li> <li>• organize and conduct research (advanced project) in a more appropriate manner</li> <li>• write a research report and thesis</li> </ul>				
<b>Content</b>	<ul style="list-style-type: none"> <li>• Overview of Research and its Methodologies</li> <li>• Literature review</li> <li>• Selecting and defining a research problem</li> <li>• Examples of Research at the University</li> <li>• Writing Research Reports and Thesis</li> <li>• Writing Research Proposals</li> </ul>				
<b>Prerequisites</b>	None				
<b>Coordinator</b>	None				
<b>Lecturer(s)</b>	Asst. Prof. Dr. Duygu Ekinci				
<b>Assistant(s)</b>	B.Sc. Sami Orçun Kortunay				
<b>Work Placement</b>	None				
Recommended or Required Reading					
<b>Books / Lecture Notes</b>	Heesen, B. Wissenschaftliches Arbeiten - Methodenwissen für das Bachelor-, Master- und Promotionsstudium.				
<b>Other Sources</b>	Google-Classroom page of the lecture				
Additional Course Material					
<b>Documents</b>	Google-Classroom page of the lecture				
<b>Assignments</b>	Google-Classroom page of the lecture				
<b>Exams</b>					
Course Composition					
<b>Mathematics und Basic Sciences</b>					%

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Engineering	20	%	
Engineering Design	40	%	
Social Sciences		%	
Educational Sciences		%	
Natural Sciences	20	%	
Health Sciences		%	
Expert Knowledge	20	%	
<b>Assessment</b>			
<b>Activity</b>	<b>Count</b>	<b>Percentage (%)</b>	
Midterm Exam	1	20	
Quiz			
Assignments	2	20	
Attendance			
Recitations			
Projects	1	20	
Final Exam	1	40	
	<b>Total</b>	<b>100</b>	
<b>ECTS Points and Work Load</b>			
<b>Activity</b>	<b>Count</b>	<b>Duration</b>	<b>Work Load (Hours)</b>
Lectures	14	2	28
Self-Study	14	1	14
Assignments	2	5	10
Presentation / Seminar Preparation	1	10	10
Midterm Exam	1	2	2
Recitations	0	0	0
Laboratory	0	0	0
Projects	0	0	0
Final Exam	1	2	2
		<b>Total Work Load</b>	<b>66</b>
		<b>ECTS Points (Total Work Load / Hours)</b>	<b>2</b>
<b>Learning Outcomes</b>			
1	Understanding a general definition of research design		
2	Understanding the link between quantitative research questions and data collection and how research questions are operationalized in educational practice		
<b>Weekly Content</b>			
1	General definitions of research design.		

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2	Characteristics of quantitative research and qualitative research.
3	Conducting a literature review - I
4	Conducting a literature review - II
5	Purpose statement, a research question , hypothesis, and research objective.
6	Quantitative data collection and processing - I
7	Quantitative data collection and processing - II
8	Descriptive statistics in educational research studies - I
9	Descriptive statistics in educational research studies - II
10	Preparation a project proposal - I
11	Preparation a project proposal - II
12	Writing a research report - I
13	Writing a research report - II
14	Ethical issues in educational research

**Contribution of Learning Outcomes to Program Objectives (1-5)**

	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	5	5	5
2	5	5	5	5	5	5	5

**Contribution Level** 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

<https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=207>

**Compiled by:** Asst. Prof. Dr. Duygu Ekinci

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