DEPARTMENT OF CIVIL ENGINEERING

Course Details				
Code	**Academic Year**			**Semester**
BAU252	3			Fall
Title	**T**	**A**	**L**	**ECTS**
Structral Physics	3	1	1	6

Language	German					
Level	**Undergraduate**	✓	**Graduate**		**Postgraduate**	
Department / Program	Civil Engineering					
Forms of Teaching and Learning	Formal					
Course Type	**Compulsory**	✓	**Elective**			
Objectives	This course aims to provide an understanding of the fundamental principles and applications of building physics, enable the analysis of the physical and mechanical properties of building materials, evaluate the interaction of building elements with heat, moisture, sound, and light, and examine their impact on building performance.					
Content	The course covers the fundamental concepts of building physics, the physical and mechanical properties of building materials, principles of heat, moisture, and sound insulation, daylighting and lighting techniques, the evaluation of building elements in terms of energy efficiency, and building performance analysis. Additionally, it includes current regulations and standards related to building physics.					
Prerequisites	-					
Coordinator	Prof. Dr. Thomas Ackermann					
Lecturer(s)	Prof. Dr. Thomas Ackermann					
Assistant(s)	Araş. Gör. Uğur Günay					
Work Placement	-					

Recommended or Required Reading	
Books / Lecture Notes	Gengel, Y. & Çengel, Y. A. (2014). Isı ve Kütle Transferi: Temeller ve Uygulamalar. Nobel Yayıncılık. Mehta, P. K., Monteiro, P. J. M. (2014). Concrete: Microstructure, Properties, and Materials. McGraw-Hill. Building Physics From physical principles to international standards Marko Pinteric
Other Sources	

Additional Course Material	
Documents	
Assignments	
Exams	

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Course Composition		
Mathematics und Basic Sciences	10	%
Engineering	30	%
Engineering Design	30	%
Social Sciences		%
Educational Sciences		%
Natural Sciences	20	%
Health Sciences		%
Expert Knowledge	10	%

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	14	3	42
Self-Study	13	7	91
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations	14	1	14
Laboratory	14	1	14
Projects			
Final Exam	1	4	4
		Total Work Load	**168**
		ECTS Points (Total Work Load / Hour)	**6**

Learning Outcomes	
1	Can define the fundamental principles of building physics.
2	Can analyze the physical and mechanical properties of building materials.

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3	Can evaluate the interaction of building elements with heat, sound, moisture, and light.
4	Can interpret building physics principles in terms of energy efficiency and sustainability.
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Weekly Content	
1	Introduction to Building Physics and Fundamental Concepts
2	Physical and Mechanical Properties of Building Materials
3	Principles of Heat Conduction, Convection, and Radiation
4	Heat Insulation and Energy Efficiency in Buildings
5	Moisture and Waterproofing Principles
6	Acoustic Comfort and Sound Insulation
7	Daylighting, Lighting, and Visual Comfort
8	Midterm Exam
9	Thermal Performance Analysis of Building Elements
10	Applications of Building Physics in Sustainable Building Design
11	Building Energy Modeling Methods in Terms of Building Physics
12	Building Physics in the Context of Regulations and Standards
13	Practical Building Performance Analysis
14	New Technologies and Innovative Approaches in Building Physics
15	General Evaluation and Case Studies
16	Final Exam

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

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**
1	4	3	2	3	4	2	
2	4	3	3	3	4	2	
3	4	3	3	3	4	2	
4	4	3	3	3	4	2	
5							

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