

DEPARTMENT OF CIVIL ENGINEERING  
COURSE SYLLABUS

Course Details					
<b>Code</b>				<b>Academic Year</b>	<b>Semester</b>
BAU517				1	1
<b>Title</b>	<b>T</b>	<b>A</b>	<b>L</b>	<b>ECTS</b>	
Landslides and slope stability	3	-	-	7	
<b>Language</b>	Turkish				
<b>Level</b>	<b>Undergraduate</b>		<b>Graduate</b>	✓	<b>Postgraduate</b>
<b>Department / Program</b>	Civil Engineering				
<b>Forms of Teaching and Learning</b>	Formal				
<b>Course Type</b>	<b>Compulsory</b>		<b>Elective</b>	✓	
<b>Objectives</b>	<p>At the end of this course, students will be able to;</p> <ul style="list-style-type: none"> <li>• Understand the key characteristics of landslides processes and mechanisms,</li> <li>• The nature of mechanisms which control landslide movement,</li> <li>• The significance of landslides in shaping landscapes and in generating risk,</li> <li>• Methods for landslide monitoring, management and mitigation,</li> <li>• Appreciate the importance of landslides in landscape evolution,</li> <li>• Classify relevant landslides hazard(s) and their physical characteristics, spatial and temporal characteristics,</li> <li>• Recognize current issues and recent developments for landslide management in different country settings,</li> <li>• Acquire the basics of the theory that are used to describe and model landslides identify the linkages between landslide hazards and their trigger factors such as storms, earthquakes, etc.,</li> <li>• Elaborate a hazard map, identifying the elements at risks and perform a risk assessment after field observations, develop methods to cope and manage risk, including land-use planning in landslides-prone areas, early-warning system and structural and non-structural measures discuss the risk management and policies at the local level and to create a safer life for people who are threatened by landslides, rockslides and other geotechnical natural disasters.</li> <li>• Standard-of-care analysis, design, and remediation of unstable slopes, landslides, rockfalls, earth retention, excavations, Topics such as rainfall-induced movements, slope risk assessment and LiDAR .</li> </ul>				
<b>Content</b>	<ul style="list-style-type: none"> <li>• Shear Strength, Stress States, and Water Pressures Fundamentals of shear strength, Measurements of strength, Laboratory tests and standards, In situ field tests of strength, Importance of Water and Pore Pressures in Slope Stability</li> <li>• Rock Slopes and Landslides Geologic materials and processes affecting landslides, Landslide mechanisms and climatic conditions, Subsurface characterization, Land use and risk, Analysis and mechanisms</li> <li>• Rock Mechanics and Rock Slope Investigations Methods to estimate shear strength of discontinuities, Rock slope failure modes and analysis, Rock slope investigation, Mapping, Geological engineering of rock slopes</li> <li>• Rock Slope and Landslide Investigations Rock slope remediation, Quarry slope</li> </ul>				

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	<ul style="list-style-type: none"> <li>• Soil Slopes, Excavations, and Cut Slopes Slope failures, movements, and processes - Triggering mechanisms - The 4 G's of slope stability: geometry, geology, hydrogeology and geotechnical</li> <li>• Slope Stability Analysis Mechanics of limit equilibrium, Slope stability analysis methods, Commonly used Methods of Slices, Selection of analysis method, Evolving Analysis methods.</li> <li>• Slope Stability Reporting Components and structure of comprehensive slope stability analysis, Slope stability reporting</li> <li>• Unsaturated Slopes Soil suction and the soil-water characteristic curve, Stress conditions in unsaturated slopes, Infinite slope stability under unsaturated seepage conditions, Case studies of rainfall-induced cut slopes.</li> <li>• Debris Flows Design methodologies, Debris flow barriers</li> <li>• Geosynthetic Use in Slopes and Embankments Reinforcement, Erosion control, Drainage, Landslide repair</li> <li>• Advancing Topics in Slope Engineering LiDAR and Photogrammetry for Slope Stability Assessment</li> </ul>	
<b>Prerequisites</b>	-	
<b>Coordinator</b>		
<b>Lecturer(s)</b>	Assoc. Prof. Dr. Enver Vural YAVUZ	
<b>Assistant(s)</b>		
<b>Work Placement</b>		
<b>Recommended or Required Reading</b>		
<b>Books / Lecture Notes</b>	<p>[1] Pradhan, S.P., Vishal, V., Singh, T.N. (2019). Landslides: Theory, Practice and Modelling. Springer Verlag.</p> <p>[2] Kliche., Ch. A., (2019). Rock slope stability. Society for Mining, Metallurgy &amp; Exploration. [3] Cheng, Y. M.; Lau, C. K (2014). Slope stability analysis and stabilization. CRC Press, USA.</p> <p>[4] Zijun C., Wang, Y., Dianqing L. (2017). Probabilistic Approaches for Geotechnical Site Characterization and Slope Stability Analysis. Springer Verlag.</p>	
<b>Other Sources</b>	-	
<b>Additional Course Material</b>		
<b>Documents</b>	-	
<b>Assignments</b>	-	
<b>Exams</b>	-	
<b>Course Composition</b>		
<b>Mathematics und Basic Sciences</b>		%
<b>Engineering</b>	50	%
<b>Engineering Design</b>		%
<b>Social Sciences</b>		%
<b>Educational Sciences</b>		%
<b>Natural Sciences</b>	50	%

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Health Sciences			%
Expert Knowledge			%
<b>Assessment</b>			
<b>Activity</b>	<b>Count</b>		<b>Percentage (%)</b>
Midterm Exam	1		40
Quiz			
Assignments	2		10
Attendance			
Recitations			
Projects			
Final Exam	1		50
<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	3	42
Self-Study	14	9	126
Assignments	2	10	20
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations			
Laboratory			
Projects			
Final Exam	1	3	3
<b>Total Work Load</b>			<b>194</b>
<b>ECTS Points (Total Work Load / Hour)</b>			<b>7</b>
<b>Learning Outcomes</b>			
1	Understand the key characteristics of landslides processes and mechanisms		
2	The nature of mechanisms which control landslide movement		
3	The significance of landslides in shaping landscapes and in generating risk		
4	Methods for landslide monitoring, management and mitigation		
5	Appreciate the importance of landslides in landscape evolution		
6	Classify relevant landslides hazard(s) and their physical characteristics, spatial and temporal characteristics		
7	Recognize current issues and recent developments for landslide management in different country settings		
8	Acquire the basics of the theory that are used to describe and model landslides identify the linkages between landslide hazards and their trigger factors such as storms, earthquakes, etc.		
9	Elaborate a hazard map, identifying the elements at risks and perform a risk assessment after field		

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	observations, develop methods to cope and manage risk, including land-use planning in landslides-prone areas, early-warning system and structural and non-structural measures discuss the risk management and policies at the local level and to create a safer life for people who are threatened by landslides, rockslides and other geotechnical natural disasters
10	Standard-of-care analysis, design, and remediation of unstable slopes, landslides, rockfalls, earth retention, excavations, Topics such as rainfall-induced movements, slope risk assessment and LiDAR
11	
12	

**Weekly Content**

1	Shear Strength, Stress States, and Water Pressures
2	Rock Slopes and Landslides
3	Rock Mechanics and Rock Slope Investigations
4	Rock Slope and Landslide Investigations
5	Soil Slopes, Excavations, and Cut Slopes
6	Slope Stability Analysis
7	Slope Stability Reporting
8	Midterm I
9	Unsaturated Slopes
10	Debris Flows
11	Geosynthetic Use in Slopes and Embankments
12	Advancing Topics in Slope Engineering
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14	
15	

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

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