

DEPARTMENT OF CIVIL ENGINEERING
COURSE SYLLABUS

Course Details				
Code	Academic Year			Semester
BAU515	1			1
Title	T	A	L	ECTS
Clays in Geotechnological Use: Structures, Problems and Applications	3	-	-	6
Language	Turkish			
Level	Undergraduate		Graduate	✓
Department / Program	Civil Engineering			
Forms of Teaching and Learning	Formal			
Course Type	Compulsory		Elective	✓
Objectives	<p>This course gives a comprehensive introduction in clay mineralogy, properties, characterising and testing methods as well as applied aspects and problems of clays and clay minerals in geotechnics.</p> <p>Upon successful completion of this course the student is able to:</p> <ul style="list-style-type: none"> • Describe clay minerals and their fundamental properties • Describe/propose methods for characterisation of clays and clay minerals • Draw conclusion about specific properties of clays with a focus to their potential use, problematics and things to consider in geotechnics and engineering geology. 			
Content	<ul style="list-style-type: none"> • Introduction to clays and clay minerals (importance and application in geosciences, industry and everyday life) • Origin of clays (formation of clays and clay minerals, geological origin) • Clay mineral structure, classification and identification incl. methods for investigation (e.g., XRD) • Properties of clay materials, characterisation and quantification incl. methods for investigation (e.g., cation exchange, rheology, plasticity, shearing, swelling, permeability, retardation and diffusion) • Clay Minerals in geotechnics: Structures, problems and applications (e.g. soil mechanics, barriers, slurry walls, tunnelling) 			
Prerequisites	-			
Coordinator				
Lecturer(s)	Assoc. Prof. Dr. Enver Vural YAVUZ			
Assistant(s)				
Work Placement				
Recommended or Required Reading				
Books / Lecture Notes	<p>[1] Millot, G., (1970). Geology of clays. Springer Verlag, Wien. [2] Velde, B., (1995). Origin and Mineralogy of Clays. Springer Verlag, Berlin. [3] Pusch, R. (2015). Bentonite Clay. CRC Press, USA. [4] Schröder, P. A., (2018). Clasy in the critical Zone. Cambridge Uni. Press.</p>			
Other Sources	-			

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Additional Course Material			
Documents	-		
Assignments	-		
Exams	-		
Course Composition			
Mathematics und Basic Sciences		%	
Engineering	50	%	
Engineering Design		%	
Social Sciences		%	
Educational Sciences		%	
Natural Sciences	50	%	
Health Sciences		%	
Expert Knowledge		%	
Assessment			
Activity	Count	Percentage (%)	
Midterm Exam	1	40	
Quiz			
Assignments	2	10	
Attendance			
Recitations			
Projects			
Final Exam	1	50	
Total		100	
ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	14	8	112
Assignments	2	7	14
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations			
Laboratory			
Projects			
Final Exam	1	3	3
Total Work Load			174
ECTS Points (Total Work Load / Hour)			6

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Learning Outcomes	
1	Describe clay minerals and their fundamental properties
2	Describe/propose methods for characterisation of clays and clay minerals
3	Draw conclusion about specific properties of clays with a focus to their potential use, problematics and things to consider in geotechnics and engineering geology.
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Weekly Content	
1	Introduction to clays and clay minerals
2	Origin of clays
3	Clay mineral structure, classification and identification incl. methods for investigation
4	Properties of clay materials, characterisation and quantification incl. methods for investigation
5	Clay Minerals in geotechnics: Structures, problems and applications
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Contribution of Learning Outcomes to Program Objectives (1-5)							
	P1	P2	P3	P4	P5	P6	P7
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2							



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Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High						
Compiled by:							
Date of Compilation:							