

Faculty	Faculty of Engineering		
Program	B.Sc. in Civil Engineering	Required	
	B.Sc. in Computer Engineering	Elective	
	B.Sc. in Electrical-Electronics Engineering	Elective	
	B.Sc. in Industrial Engineering	Elective	
	B.Sc. in Mechanical Engineering	Elective	

Course Code	GEOS 204			
Course Title in English	Geology			
Course Title in Turkish	Jeoloji			
Language of Instruction	English			
Type of Course	Flipped Classroom / Lecture / Project / Laboratory Work			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science	Basic Engineering	Engineering Design	General Education
	100	-	-	-
Semester Offered	Spring			
Contact Hours per Week	Lecture: 3 hours	Recitation:-	Lab:-	Other:-
Estimated Student Workload	87 hours			
Number of Credits	3 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	None			
Expected Prior Knowledge	None			
Co-requisites	None			
Registration Restrictions	Only Undergraduate Students			
Overall Educational Objective	To learn the basic structure of the earth, plate tectonics theory, rock forming geological processes, corresponding minerals and rock types, soil formation, topographical mapping and geological mapping in context of engineering applications.			
Course Description	This course provides a comprehensive introduction to basic geological concepts. The following topics are covered: Earth structure, Plate tectonics, Matters & minerals, Magmatic processes & Igneous rocks, Sedimentary processes & Sedimentary Rocks, Metamorphic processes & Metamorphic rocks, Weathering processes & Soil formation, Soil Profile and Soil nomenclature, Geologic time, Structural geology, Topographical and Geologic Mapping, Earthquakes, Faults, Seismicity, Crustal deformation, Groundwater, Surface water, Geology in Engineering Applications.			
Course Description in Turkish	Bu derste temel jeoloji kavramları Őu konu baŐlıkları altında kapsamlı bir Őekilde incelenmektedir: DŐnyanın yapısı, plaka tektoniĐi, madde ve mineraller, magmatik sŐreĐler ve maĐmatik kayalar, tortul sŐreĐler ve tortul kayalar, metamorfik sŐreĐler ve metamorfik kayalar, ayrışma sŐreĐleri ve zemin oluŐumu, zemin profili, zemin terimleri, jeolojik zaman, yapısal jeoloji, topoĐrafik ve jeolojik haritaların yorumlanması, deprem, fay hatları & deprensellik, kabuk deformasyonları, yeraltısuyu ve yerŐstŐ su kaynakları, jeolojinin mŐhendislik uygulamalarındaki yeri.			
Course Learning Outcomes and Competencies	Upon successful completion of the course, the learner is expected to: <ol style="list-style-type: none"> 1. discuss plate tectonics theory & plate boundaries, relates plate tectonics to earthquakes & faults, identifies structure of the earth & geologic time, applies relative dating principles; 2. describe metamorphic, magmatic, sedimentary processes & compares the corresponding common minerals & rock types; 3. identify the weathering processes, soil formation, soil profile & nomenclature based on soil particle size; 			

	<ol style="list-style-type: none"> 4. interpret topographical maps & simple geological maps, utilize the information from geological and topographical maps to develop geologic cross-sections, identify basic geologic structures on cross-sections; 5. discuss groundwater and surface water concepts in geology, relates surface water to soil deposition, relates geological concepts to engineering applications; 6. demonstrate skills of self-directed study & explain one of the earth science (geology) related contemporary issues. 		
Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1,2,3,4,5	Exams, FC Activities
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors			
(3) an ability to communicate effectively with a range of audiences			
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives			
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions			
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	S	6	Essay HW
Prepared by and Date	Asst. Prof. Gökçe Tönük / December 2019		
Semester	Spring 2019-2020		
Name of Instructor	Assoc. Prof. Ömer ÜNDÜL		
Course Contents	Week	Topic	
	1.	An Introduction to Geology: The Science of Earth, Importance of Geology in Engineering Applications, Earth Structure,	
	2.	Plate Tectonics: Theory of Continental Drift, The Theory of Plate Tectonics, Earth's Major Plates, Divergent and Convergent Plate Boundaries	
	3.	Matter & Minerals: How do minerals form? Physical Properties of Minerals, Most Common Minerals, Term Project Discussion: Requirements	
	4.	Igneous Rocks & Volcanos: Magma, Intrusive Activity, Igneous Textures, Common Igneous Rocks, Nature of Volcanos	
	5.	Weathering & Soils: Categories of Weathering, Soil formation, Soil Exploration, Soil Classification	
	6.	Sedimentary Rocks: Origin & Classification, Common Sedimentary Rocks	
	7.	Metamorphic Rocks: Metamorphism, Parent Rocks, Metamorphic Environments, Common Metamorphic Rocks, Laboratory: Observing Major Rock Types, Physical Properties & Minerals	
	8.	Earth's Interior, Geologic Time, Crustal Deformation	
	9.	Structural Geology: Topographical Mapping & Geologic Mapping Basics	
	10.	Structural Geology: Constructing Geologic Cross-Sections	
	11.	Structural Geology: Constructing Geologic Cross-Sections	
	12.	Earthquakes: Earthquakes, Seismicity & Faults	

	Divergent & Convergent Boundaries																								
	13. Water in Geology: Groundwater & Surface Water																								
	14. Overview of Ground Exploration, Applications of Engineering Geology: Tunnels, Dams, Foundations & Building Materials																								
	15. Final Exam/Project/Presentation period																								
	16. Final Exam/Project/Presentation period																								
Required/Recommended Readings	<p>Required Textbooks:</p> <ul style="list-style-type: none"> Tarback E.J., Lutgens, F. K., Tasa, D.G. (2012). Earth An Introduction to Physical Geology, 11th Edition, Pearson, ISBN13:978-0321820945 ISBN-10:0321820940 <p>Recommended Readings from Textbooks:</p> <ul style="list-style-type: none"> Goodman, R.E. (1992). Engineering Geology, John Wiley & Sons, ISBN:0-471-54424-8. Bell F.G. (2007). Engineering Geology, 2nd Ed., Elsevier, ISBN:13-978-0-7506-077-6. Walthan, T. (2007). Foundations of Engineering Geology, 3rd Ed., Spon Press, ISBN13:978 0 415 46960-9 ISBN-10:0-415-46960-0. 																								
Teaching Methods	Lectures/contact hours using "flipped classroom" as an active learning technique																								
Homework and Projects	1 Essay Homework																								
Laboratory Work	1 Week of Mini Geology Laboratory for Rock & Mineral Identification																								
Computer Use	MS Office or Equivalent Programs are required																								
Other Activities	-																								
Assessment Methods	<table border="1"> <thead> <tr> <th>Types of assessment</th> <th>Number</th> <th>Ratio (%)</th> </tr> </thead> <tbody> <tr> <td>Midterm Exam</td> <td>1</td> <td>35</td> </tr> <tr> <td>Flipped Classroom Activities</td> <td></td> <td></td> </tr> <tr> <td> In- class quizzes</td> <td></td> <td>10</td> </tr> <tr> <td> Digital Platform</td> <td></td> <td>10</td> </tr> <tr> <td>Essay HW</td> <td>1</td> <td>5</td> </tr> <tr> <td>Final Exam</td> <td>1</td> <td>40</td> </tr> <tr> <td>Total</td> <td></td> <td>100</td> </tr> </tbody> </table>	Types of assessment	Number	Ratio (%)	Midterm Exam	1	35	Flipped Classroom Activities			In- class quizzes		10	Digital Platform		10	Essay HW	1	5	Final Exam	1	40	Total		100
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Course Administration	<p>Instructor's office and phone number:</p> <p>office hours:</p> <p>e-mail address:</p> <p>Rules for attendance: Minimum of 70% attendance required. In-Classroom and Online Tests contributes to 20% of the final grade.</p> <p>Missing a midterm / quiz: Provided that proper documents of excuse are presented, missed midterm / quiz by the student will be given the grade of the final exam. No make-up will be given.</p> <p>Missing the term project / final exam: Faculty regulations.</p> <p>A reminder of proper classroom behavior, code of student conduct: YÖK Regulations</p> <p>Statement on plagiarism: YÖK Regulations http://3fcampus.mef.edu.tr/uploads/cms/webadmin.mef.edu.tr/4833_2.pdf</p>																								

ECTS Student Workload Estimation	Activity	No/Weeks	Hours			Calculation	Explanation
		No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
	Lecture	14		3		42	A*(B+C+D)
	Quizzes	5	1			5	A*(B+C+D)
	Essay HW	1	4			4	A*(B+C+D)
	Midterm(s)	1	12	2		14	A*(B+C+D)
						0	A*(B+C+D)
	Final Examination	1	20	2		22	A*(B+C+D)
	Total Workload					87	
	Total Workload/25					3,48	
ECTS					3		