

<b>Department of Civil Engineering</b>			
<b>Engineering Geology (61230)</b>			
<b>Total Credits</b>	<b>2</b>		
<b>major compulsory</b>			
<b>Prerequisites</b>	<b>-</b>		
<b>Course Contents</b>			
This course studies various types of geological sciences and their relationship to other sciences. Topics covered include: cosmology, crystallography, mineralogy, petrology and soil and rock engineering behavior. At the end, it provides an introduction to soil mechanics.			
<b>Intended Learning Outcomes (ILO's)</b>		<b>Student Outcomes (SO's)</b>	<b>Contribution</b>
1	Realize the importance of geology to civil engineering	A	10 %
2	Recognize the minerals; rock-forming minerals	A	25 %
3	Distinguish between the main types of rocks	A	20 %
4	Understand the general mechanism of internal and external Earths processes	A	15 %
5	Investigate the geological features and conditions of an engineering site	A	30 %
<b>Textbook and/ or References</b>			
1. Bangar K., (1995): Principles of Engineering Geology, Stand Publishers Distributors (SPD), Delhi. 2. Bell, F., G., (2007): Engineering Geology, Elsevier, and Paris. 3. Lutagens F. & Tarbuck E., (1986): Essentials of Geology, Bell & Howell Company, Sydney. 4. Maslov N., (1987): Basic Engineering Geology and Soil Mechanics, Mir Publishers, Moscow. 5. Mclean A. & Gribble C., (1997): Geology for Civil Engineers Chapman & hall, London.			
<b>Assessment Criteria</b>		<b>Percent (%)</b>	
First Exam		25 %	
Second Exam		25 %	
Final Exam		50 %	
<b>Course Plan</b>			
<b>Week</b>	<b>Topic</b>		
1&2	Introduction Branches of geology, What is engineering geology? Relevance of geology to civil engineering.		
3	Role of the engineer in the systematic exploration of a site		
4, 5 & 6	Materials of the Earth Crust Minerals (definitions, fundamental atomic theory, physical properties of minerals), Mineral groups (silicate minerals, alteration minerals, non-silicate minerals)		
7	MIDTERM EXAM 1 Materials of the Earth Crust Rocks (definitions, the nature of rocks, types of rocks)		
8	Igneous rocks (origin, mineralogy, textures, and classification of igneous rocks).		
9&10	Sedimentary rocks (origin, mineralogy, textures, and classification of sedimentary rocks), Metamorphic rocks (type of metamorphism).		
11&12	Weathering Superficial deposits, engineering soil, mechanical weathering, chemical weathering, and biological weathering. MIDTERM EXAM 2		
13	Deformation of rocks Distribution of rocks at and below the surface, geological maps and sections, stresses and strains, folds, fractures (joints and faults)		
14	Plate tectonics earths layers (crust, mantle, core), plates (continental plates and oceanic plates)		

15	Geological Hazards Types of geological hazards (earthquakes, land-sliding, volcanoes), hazards items (risk, vulnerability, preparedness)
16	Final Exam