

1.	Name of Course				Engineering Geology			
2.	Course Code				JENG1053			
	JENG = the first alphabet identify the faculty within which the subject is offered., JENG = the remaining three alphabet identify the course that offers the subject, 1053 = the first digit identify level of study; in this case undergraduate level, 1053 = the second and third digits identify subject identity and1053 = the fourth digit identify credit value or credit hours							
3.	Name(s) of academic staff				To be Assigned			
4.	Rationale for the inclusion of the course/module in the programme				Engineering Geology is essential to civil engineers as most civil engineering projects are related to the ground.			
5.	Semester and Year offered				2/1			
6.	Total Student Learning Time (SLT)		Face to Face		Total Guided and Independent Learning			
	L = Lecture T = Tutorial P = Practical S=Studio Works O= Others		L	T	P/S	O	Independent Study (IS) =70 Total =126	
			42	-	14	-		
7.	Credit Value							
	Lecture (3 hours per week x 14 weeks) Practical (2 hours fortnightly x 7 weeks)							
8.	Prerequisite (if any)				None			
9.	Course Objectives 1. The objective of this course is to give understanding to students the science of geology and the application of Engineering geology to civil engineering. Course Learning Outcomes (CLO) At the end of the semester students should be able to: CLO1: Understand the basic science of geology and geological process. CLO2: To know and understand the properties of common rock forming minerals and rock types. CLO3: To understand and able to interpret structural geological map. CLO4: To understand the basic knowledge in rock engineering and be able to carry out common tests on rock samples.							
10.	Transferable Skills: Transferable Skills: This course is expected the development of the following transferable skills: a) Self-management – an ability to manage time and task b) Learning skills - An ability to learn both independently and co—operatively; - An ability to use library skills, to find and organize information ; - An ability to use a wide range of academic skills (research, analysis, synthesis etc.); - An ability to identify and evaluate personal learning strategies. c) Teamwork - An ability to take responsibility and carry out agreed task; - An ability to take initiative and lead other; - An ability to identify and evaluate personal learning strategy. d) Problem solving - An ability to analyse; - An ability to think laterally about a problem;							

	▪ An ability to identify strategy options; ▪ An ability to solve the problems e) Information technologies ▪ An ability to use specialist software where relevant to the discipline.														
11.	Teaching-learning and assessment strategy A variety of teaching strategies are used throughout the course, including the following: • Classroom Lessons; Lecturer and power point presentations • Tutorial Session; • Student-Lecturer Discussion • Collaborative and Co-operative learn; • Independent study. Assessment: <table> <tr> <td>Coursework</td><td>40%</td></tr> <tr> <td>Assignment</td><td>5%</td></tr> <tr> <td>Quizzes</td><td>5%</td></tr> <tr> <td>Laboratory works</td><td>10%</td></tr> <tr> <td>Test</td><td>20%</td></tr> <tr> <td>Examination</td><td>60%</td></tr> <tr> <td><u>Total</u></td><td><u>100%</u></td></tr> </table>	Coursework	40%	Assignment	5%	Quizzes	5%	Laboratory works	10%	Test	20%	Examination	60%	<u>Total</u>	<u>100%</u>
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12.	Synopsis: This course cover topics on earth structure, geological process, rock forming minerals, formation of sedimentary, igneous and metamorphic rocks, structural geology and rock engineering.														
13.	Mode of Delivery: Lectures; Practical.														

14.	Performance Criteria :						
	CLO-PLO	Assessment Tool	1	2	3	4	5
	Marks		0-39	40-49	50-59	60-74	75-100
	Grade		(F)	(D,D+)	(C-,C,C+)	(B-,B,B+)	(A-,A,A+)
	CLO1: Understand the basic science of geology and geological process.	Assignments Quizzes Laboratory works Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task
	CLO2: To know and understand the properties of common rock forming minerals and rock types.	Assignments Quizzes Laboratory works Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take

			responsibility and carry out laboratory test • Manage time and task	responsibility and carry out laboratory test • Manage time and task	responsibility and carry out laboratory test • Manage time and task	• Take responsibility and carry out laboratory test • Manage time and task	responsibility and carry out laboratory test • Manage time and task
CLO3: To understand and able to interprets structural geological map.	Assignments Quizzes Laboratory works Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out laboratory test • Manage time and task	
CLO4: To understand the basic knowledge in rock engineering and be able to carry out common tests on rock Samples	Assignments Quizzes Laboratory works Test Examination	Fail to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out	Poor to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out	Satisfactory to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out	Good to: • Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility	Excellent to: • To: Learn both independent and cooperatively • Use library skills, to find and organize information • Take responsibility and carry out	

			laboratory test • Manage time and task	laboratory test • Manage time and task	laboratory test • Manage time and task	and carry out laboratory test • Manage time and task	laboratory test • Manage time and task
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15.	Mapping of the Programme Objectives to the Programme Learning Outcomes											
	Programme Learning Outcomes (PLO) Programme Objectives (PO)	PLO1: Ability to acquire and apply knowledge of science and engineering fundamentals;	PLO2: Acquired in-depth technical competence in civil engineering discipline;	PLO3: Ability to undertake problem identification, formulation and solution;	PLO4: Ability to utilize systems approach to design and evaluate operational performance;	PLO5: Understanding of the principles of design for sustainable development;	PLO6: Understanding of professional ethics, Islamic values, social, cultural, global and environmental responsibilities of a professional engineer and commitment to them;	PLO7: Ability to communicate effectively, not only with engineers but also with the community at large;	PLO8: ability to function effectively as an individual;	PLO9: Ability to function effectively in group with the capacity to be a leader or manager;	PLO10: Recognizing the need to undertake lifelong learning, and possessing /acquiring the capacity to do so;	PLO11: ability to become Entrepreneur;
	PEO1: To produce graduates with proficient knowledge and competency in various areas in Civil/ Electrical/ Mechanical Engineering	✓	✓	✓								
	PEO2: To produce graduates with professional, generic attributes to meet the present and future global demands.				✓	✓	✓			✓	✓	
	PEO3: To produce graduates with Islamic humanistic values and reinvention skills to meet the requirement of a dynamic environment. These skills include Civil Intelligence, Moral Intelligence, Self-Reliance								✓	✓	✓	

	and Communication Skills											
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16.	Mapping of the course Learning Outcome to the Programme Outcome											
	Programme Learning Outcomes (PLO) Course Learning Outcome (CLO)	PLO1: Ability to acquire and apply knowledge of science and engineering fundamentals;	PLO2: Acquired in-depth technical competence in civil engineering discipline;	PLO3: Ability to undertake problem identification, formulation and solution;	PLO4: Ability to utilise systems approach to design and evaluate operational performance;	PLO5: Understanding of the principles of design for sustainable development;	PLO6: Understanding of professional ethics, Islamic values, social, cultural, global and environmental responsibilities of a professional engineer and commitment to them;	PLO7: Ability to communicate effectively, not only with engineers but also with the community at large;	PLO8: ability to function effectively as an individual;	PLO9: Ability to function effectively in group with the capacity to be a leader or manager;	PLO10: Recognising the need to undertake lifelong learning, and possessing /acquiring the capacity to do so;	PLO11: ability to become Entrepreneur;
	CLO1: Understand the basic science of geology and geological process.	✓										
	CLO2: To know and understand the properties of common rock forming minerals and rock types.	✓										
	CLO3: To understand and able to interpret structural geological map.	✓	✓	✓								

	CLO4:											
	To understand the basic knowledge in rock engineering and be able to carry out common tests on rock Samples	✓	✓	✓								

17.	Content outline of the course/module and the SLT per topic					
	Details	SLT (Hour)				
		L	T	P	IS	Total
Topic 1	Introduction to Geology and Geological process - Principle divisions in the earth - Physical features of the earth and structure of earth - Geological processes - Plate tectonics - Process of Gradation - Process of volcanism - Historical geology and geological time scale	3	-	-	5	8
Topic 2	Mineralogy - Physical properties of minerals - Rock forming minerals - Silicate minerals - Non silicate minerals - Minerals in sand clay	6	-	-	10	16
Topic 3	The Study of Rocks - Geological cycle of rock - Igneous rock - Formation and type of igneous rock - Classification of igneous rock - Sedimentary rock - Formation and type of sedimentary rock - Classification of sedimentary rock - Metamorphic rock - Formation and type of metamorphic rock - Classification of metamorphic rock	12	-	-	20	32
Topic 4	Weathering of Rock - Physical weathering of rock - Chemical weathering of rock - Soil formation and residual soil - Weathering grade	6	-	-	10	16
Topic 5	Structural geology - Strike and dip - Folds, faults and joints - Place of weakness in rock mass - Introduction to two-dimensional structural mapping	9	-	-	15	24

	Topic 6	Rock Engineering • Engineering properties of rocks material • Introduction to stress and deformation in rock • Rock quality designation • Rock mass classification	6	-	-	10	16
	Practical	PRACTICALS Rock Materials • Identification of rock forming minerals • Identification of igneous , sedimentary and metamorphic rocks Structural Geology of Geological maps • Geological map • Contour, horizontal strata, strike, dip and thickness of beds Testing on Rock Samples • Hardness test • Rebound hammer test • Point Load test • Uniaxial compression test	-	-	6 4 4	-	14
	Total (Hour)		42	-	14	70	126
18.	Main references supporting the course 1. Geotechnical Engineering: Principles & Practices (2nd Edition) by Donald P. Coduto, Man-chu Ronald Yeung and William A. Kitch (Apr 8, 2010) 2. Geology: Basics for Engineers by Aurèle Parriaux (Aug 12, 2009) 3. Engineering Geology: Principles and Practice by David George Price and Michael de Freitas (Nov 9, 2010) 4. Geology and Engineering Robert F. Legget (1988)						
	Additional references supporting the course 1. Geology Made Simple William H. Matthews (1970) 2. Engineering Geology Perry H. Rahn (1986) 3. General Geology for Engineers Alan E. Kehew (1988)						
19.	Other additional information All materials will be available to the students in the library.						