



Bachelor Program in Geophysics

Faculty of Mathematics and Natural Sciences

HASANUDDIN UNIVERSITY

6. Physics of Rocks and Soils

Module Name	:	Physics of Rocks and Soils
Module Level	:	Bachelor
Code, if applicable	:	23H06121902
Subtitle, if applicable	:	-
Courses, if applicable	:	Geophysics
Semester(s) in which the module is taught	:	IV (Fourth Semester)
Module coordinator(s)	:	Drs. Erfan, M.Si.
Lecturer(s)	:	• Drs. Erfan, M.Si. • Dra. Maria, M.Si. • Syamsuddin, S.Si., MT.
Language	:	Bahasa (Indonesian language)
Relation to curriculum	:	Elective courses in the second year for Bachelor Degree in Geophysics
Type of teaching, contact hours	:	This course is delivered through Lectures (i.e., Project/Case-based learning), complemented by structured assignments (paper review, project/case evaluation) and independent study. Contact hours consist of 100 minutes lectures per week, plus 120 minutes per week for each of the following: structured assignments and independent study
Workload	:	Total workload is 90 hours per semester, consisting of 28 hours for lectures, and 31 hours each for structured assignments and independent study
Credit points	:	2 SKS (3.2 ECTS)
Requirements according to the examination regulations	:	Students are eligible to attend the examination if their absences are less than 20% of the lectures
Recommended prerequisites	:	-
Module objectives/intended learning outcomes	:	After completion of this module, students will be able to: CLO 1. Able to identify the basic parameters of rocks and the characteristics of soils; CLO 2. Able to understand the physical properties of rocks; CLO 3. Able to explain the principles of soil mechanics;



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		CLO 4. Able to explain soil and water conservation; The following is the mapping of the ILO and the CLO of this course: <table><tr><td></td><td>ILO 4</td><td>ILO 6</td><td>ILO</td><td>ILO</td></tr><tr><td>CLO</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>CLO</td><td></td><td>✓</td><td></td><td></td></tr><tr><td>CLO</td><td></td><td></td><td>✓</td><td></td></tr><tr><td>CLO</td><td></td><td></td><td></td><td>✓</td></tr></table>		ILO 4	ILO 6	ILO	ILO	CLO	✓				CLO		✓			CLO			✓		CLO				✓
	ILO 4	ILO 6	ILO	ILO																							
CLO	✓																										
CLO		✓																									
CLO			✓																								
CLO				✓																							
Content	:	1. Porosity and Density of Rocks 2. Physical Properties of Rocks (thermal properties, elasticity, seismic wave attenuation, magnetism, and electrical properties) 3. Seepage and Groundwater Flow Networks 4. Effective Stress and Shear Strength 5. Soil Consolidation, Bearing Capacity, and Slope Stability 6. Soil and Water Conservation																									
Study and examination requirements		Participants are marked based on their performance in theory: Project / Case Study (79%), Assignment (11), and Written Examination (10%). Students are marked based on their percentage of points obtained and based on the following grade scale: <table><tr><th>Percentage of Achievement</th><th>Grade</th><th>Conversion Value</th></tr><tr><td>85 – 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - <85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - < 80</td><td>B+</td><td>3.5</td></tr><tr><td>70 - < 75</td><td>B</td><td>3.0</td></tr></table>	Percentage of Achievement	Grade	Conversion Value	85 – 100	A	4.00	80 - <85	A-	3.75	75 - < 80	B+	3.5	70 - < 75	B	3.0										
Percentage of Achievement	Grade	Conversion Value																									
85 – 100	A	4.00																									
80 - <85	A-	3.75																									
75 - < 80	B+	3.5																									
70 - < 75	B	3.0																									



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			65 - < 70	B-	2.75	
			60 - < 65	C+	2.5	
			50 - < 60	C	2.00	
			40 - < 50	D	1.00	
			< 40	E	0.00	
Exams and assessment formats		Assessment in this course consists of a project or case study, assignments, and written examination. The project or case study is conducted in a group or individually and requires students to apply theoretical concepts to analyze and solve a problem, presented in the form of a written report. Assignments are completed individually and may include problem-solving tasks, data processing, or short essays; these are submitted in written form and may involve graphical or computational outputs. The written examination (<i>closed-book</i> , written) evaluates students' understanding of fundamental concepts covered CLO 1, CLO 2, CLO 3, and CLO 4.				
Reading list	1	Main References: - Rochmad, M.N., 2014, Fisika Batuan: Sifat Fisika Batuan, ITS, Surabaya. 8. Fitrianto, T., 2011, Pemodelan Rock Physics dalam Karakterisasi Reservoir Menggunakan Impedansi Elastik untuk Memetakan Sebaran Reservoir dan Minyak pada Formasi Gumai di Lapangan Jura, UI, Jakarta 9. - Hardjowigeno, S., 2010, "Ilmu Tanah", Akademik - Pressindo, Jakarta. 10. Hutagalung, A.S., 2007, "Pelepasan, Penyelesaian, dan Kesepakatan dalam Konsolidasi Tanah bagi Pembangunan Rumah Susun Ditinjau dari Hukum - Perdata", BPN, Jakarta 11. Mega, I M., dkk, 2010, "Klasifikasi Tanah dan Kesesuaian Lahan", Bahan Ajar, Universitas Udayana, Denpasar 12. Puja, I N., 2008, "Penuntun - Praktikum Fisika Tanah", Jurusan Tanah Universitas Udayana, Denpasar.				
Last revision date		July 1 st , 2025				