



	INSTITUT TEKNOLOGI SEPULUH NOPEMBER FACULTY OF CIVIL PLANNING AND GEO ENGINEERING GEOPHYSICAL ENGINEERING DEPARTMENT UNDERGRADUATE PROGRAM (S1)	
Course	Course Name	Rock Physics
	Course Code	CF234310
	Credit	4 (Four)
	Semester	3 (Three)
COURSE DESCRIPTION		
<p>This course explains the characteristics of rocks as porous media that are elastic, at the micro scale. The characterization is carried out based on measurements of physical variables and the relationships between existing variables to obtain important physical parameters that can be used later in geophysical exploration, especially on a macro scale, starting from evaluating well logs to geophysical measurements in the field. Evaluation of the physical characteristics of the rock is able to provide corrections and guidance in evaluating subsurface physical conditions in accordance with exploration objectives. The course material covers knowledge of the physical properties (elasticity, electricity, hydrodynamics) of the rock matrix, the presence of pores in rocks, the presence of fluids (both single and multi-phase) in the pores.</p>		
PROGRAM LEARNING OUTCOMES (PLO)		
CLO-5	Able to explain the concepts and principles of geophysical engineering methods that utilize geological, geospatial, instrumentation and information technology data to create or modify models to solve complex geophysical and geophysical engineering problems in depth and procedurally by prioritizing conservation concepts and principles environment, occupational safety and health in the laboratory and field, current principles and issues in legal, economic, environmental, socio-cultural, political, health and safety aspects, sustainable development as well as the development of the latest technology and advanced materials in the field of geophysical engineering.	
CLO-6	Able to apply processes or components of geophysical engineering methods to create or modify models that utilize geological, geospatial, instrumentation and information technology data procedurally starting from identifying, formulating, analyzing and finding the source of the problem, proposing the best solution to solve the problem, designing and operationalizing the process, processing systems and hardware and software equipment required in existing geophysical engineering designs, local and national resources as well as engineering design and analysis tools that are most appropriate, effective and efficient in solving complex geological and geophysical engineering problems in depth by taking into account factors law, economics, environment, socio-cultural, political, health, public safety, culture, and sustainable development.	
COURSE LEARNING OUTCOMES (CLO)		
CLO-1	Able to master the basic principles of rock physics parameters in the application of the earth field	
CLO-2	Able to master the concepts and techniques for designing rock physical parameter measurement tools	



SUB COURSE LEARNING OUTCOMES (SUB CLO)	
Sub CLO-1	[C4,P3,A3] Able to understand the concepts and relationships between rock physical variables to extract important rock parameters for exploration purposes.
Sub CLO-2	[C4,P3,A3] Able to implement physical parameter measurements in the laboratory with a variety of rock samples.
Sub CLO-3	[C4,P3,A3] Able to explain the development of science and technology of physical parameter measurement methodology.
Sub CLO-4	[C4,P3,A3] Able to design a simple measurement system (tools and methodology) to be followed up by measuring rock physics variables on a laboratory scale.
STUDY MATERIALS	
<p>Introduction: background and basic understanding of rock physics, rocks as part of the earth's crust and soil as a result of chemical-physical weathering of rocks, rocks and soil as part of the earth's crust.</p> <p>Measurement and modeling of rock physics characteristics: design of rock physics data acquisition and measurement on a laboratory scale and its development on a field scale.</p> <p>Rock characteristic variables and parameters: solid material (matrix), pore space and fluid content in the pores which influence each other.</p> <p>Application: relationship of rock characteristics at various rock physics measurement scales and its application in geophysical exploration in the field.</p>	
PRECONDITION	
Basic Physics II, Calculus II	
REFERENCES	
<ol style="list-style-type: none">1. Schoon, J.H., 1998, Physical Properties of Rocks: Fundamental and Principles Of Petrophysics, Pergamon.2. Bowless J E, 1979, Physical and Geotechnical Properties of Soils, Mc Graw hill Co, Tokyo3. Mavko, Gary., et al, 2009, The Rock Physics Handbook, Cambridge University Press, UK.4. Terzghy K, dkk, 1997, Soil Mechanics in Engineering Practise, Prantice Hall, NY5. Journals and Proceedings	