	INSTITUT TEKNOLOGI SEPULUH NOPEMBER FACULTY OF CIVIL PLANNING AND GEO ENGINEERING GEOPHYSICAL ENGINEERING DEPARTMENT UNDERGRADUATE PROGRAM (S1)	
Course	**Course Name**	**Well Log Data Analysis**
	Course Code	**CF234417**
	Credit	**3 (Three)**
	Semester	**4 (Four)**
COURSE DESCRIPTION		
This course studies the basic science and engineering of subsurface knowledge of drilling wells, the methods used, the acquisition of these methods, data processing from acquisition, to the interpretation of drill holes based on the methods used, both lithology and fluids, with the main aim being to formation evaluation.		
PROGRAM LEARNING OUTCOMES (PLO)		
PLO-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.	
PLO-6	Able to apply procedural processes or components of geophysical engineering methods to create or modify models that utilize geological, geospatial, instrumentation and information technology data starting from identifying, formulating, analyzing and finding the source of problems, proposing the best solutions to solve problems, designing and operationalizing processes, processing systems and hardware and software equipment needed in existing geophysical engineering designs, local, national resources and engineering design and analysis tools that are most suitable, 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	Students are able to apply the basic concepts of rock petrophysics with their respective physical characteristics and properties to subsurface conditions	
CLO-2	Students are able to implement the results of methods for measuring physical rock properties to interpret subsurface conditions such as lithology or volumetrics of a rock layer below the surface	
SUB COURSE LEARNING OUTCOMES (SUB CLO)		
Sub CLO-1	[C2, A3] Students are able to explain the basics of rocks and petrophysics including fluids, such as their composition (minerals) and physical properties such as porosity, permeability, saturation, etc.	
Sub CLO-2	[C3, P3, A4] Students are able to explain geophysical methods in well-logging such as Gamma Ray, Resistivity, Neutron-Density, Sonic, Spontaneous, etc.	

Sub CLO-3	[C3, P3, A4] Students are able to explain and calculate the values of physical rock parameters based on well-log data, such as determining and calculating the values of porosity, permeability, saturation for each wellbore, and also interpreting subsurface conditions
Sub CLO-4	[C3, P3, A4] Students are able to interpret and correlate several well holes based on well-log data and obtain subsurface geological models such as (lithology, stratigraphic facies, subsurface structure).

STUDY MATERIALS

1. Basic introduction to Pertophysics
2. Basics of rock physics and properties
3. Basics of well-logging measurement methods
4. well-logging data acquisition
5. processing and calculating the physical properties of rocks
6. subsurface analysis using well-loG data
7. structural and stratigraphic analysis using well-log data, subsurface models (formation evaluation) using well-log data.

PRECONDITION

Rock Physics

REFERENCES

1. Darling, T., “Well Logging and Formation Evaluation”, Elsevier Inc., 2000
2. Tiab, D. and Donaldson, E.C., “Petrophysics 2nd.”, Elsevier, 2004.
3. Journal Of Petroleum Geologists

Supporters:

1. Asquith, GB And Krygowski, D., “Basic Well Log Analysis, 2nd”, American Association of Petroleoum Geologists, 2004.
2. Rider, M., “The Geological Interpretation of Well Logs, 2nd”, Rider-French Consulting Ltd., 2002.
3. Asquith, GB And Gibson, CR, “Basic Well Log Analysis for Geologists”, American Association of Petroleoum Geologists, 1982.
4. AAPG and IPA proceedings articles
5. Geophysical Journal