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| | INSTITUT TEKNOLOGI SEPULUH NOPEMBER FACULTY OF CIVIL PLANNING AND GEO ENGINEERING GEOPHYSICAL ENGINEERING DEPARTMENT UNDERGRADUATE PROGRAM (S1) | |
| Course | Course Name | Geophysical Digital Data Analysis |
| | Course Code | CF234416 |
| | Credit | 3 (Three) |
| | Semester | 4 (Four) |
| COURSE DESCRIPTION | | |
| This course studies the basics of digital signal analysis which are commonly used in geophysical data analysis such as Fourier transform, discrete Fourier transform, convolution, correlation, sampling theory, digital signal phase properties and filtering. | | |
| 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. | |
| COURSE LEARNING OUTCOMES (CLO) | | |
| CLO-1 | Able to understand the basic concepts of digital data analysis in Geophysical data processing (Basic Sciences, physical parameters and basic laws). | |
| CLO-2 | Able to implement GEOPHYSICS DIGITAL DATA ANALYSIS in designing geophysical data processing (filters, sampling, image processing) to produce and optimize data processing to produce/provide quality data for interpretation | |
| SUB COURSE LEARNING OUTCOMES (SUB CLO) | | |
| Sub CLO-1 | [C2, A3, P2] Able to explain the basic concepts and principles of GEOPHYSICS DIGITAL DATA ANALYSIS in processing geophysical data. | |
| Sub CLO-2 | [C3, P3, A4] Able to implement the GEOPHYSICS DIGITAL DATA ANALYSIS methodology in geophysical data processing | |
| Sub CLO-3 | [C3, P3, A4] Able to implement and analyze the results of geophysical data processing | |
| Sub CLO-4 | [C3, P3, A4] Able to implement and present quality data processing results. | |
| STUDY MATERIALS | | |
| <ul style="list-style-type: none">• Introduction; signals and systems• Basic concepts of digital data analysis• Fourier transform, Fourier analysis of analog functions• The fourier transform is fast and discrete• Sampling theory and applications• Convolution theory and applications• Correlation theory and applications• Filter theory and applications | | |



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| PRECONDITION |
| Mathematical Geophysics |
| REFERENCES |
| 1. Keilis-Borok (auth.), VI Keilis-Borok, Edward A. Flinn (eds.)-Computational Seismology-Springer US (1995) |
| 2. Clearbout, J.F.; Fundamentals of Geophysical Data Processing With Applications to Petroleum Prospecting. Mc. Graw-Hill Book Co., New York, 1976. |
| 3. Sheriff, RE, and Geldart, LP; Exploration Seismology Vol.2: Data Processing and Interpretation. Cambridge University Press, 1983. |
| 4. Oram Brigham B.: The Fast Fourier Transform and Its Applications. Prentice-Hall Inc., 1988. |