



Bachelor Program in Geophysics

Faculty of Mathematics and Natural Sciences
HASANUDDIN UNIVERSITY

18. Geoelectrical and Electromagnetic Methods

Module Name	:	Geoelectrical And Electromagnetic Methods
Module Level	:	Bachelor
Code, if applicable	:	23H06120904
Subtitle, if applicable	:	-
Courses, if applicable	:	Geophysics
Semester(s) in which the module is taught	:	4 (Fourth Semester)
Module coordinator(s)	:	Dr. Sakka, M.Si.
Lecturer(s)	:	Dr. Sakka, M.Si. Dr. Muhammad Hamzah S., S.Si.,MT. Syamsuddin, S.Si.,MT.
Language	:	Bahasa (Indonesian language)
Relation to curriculum	:	Compulsory course 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 200 minutes lectures per week, plus 240 minutes per week for each of the following: structured assignments and independent study
Workload	:	Total workload is 180 hours per semester, consisting of 56 hours for lectures, and 62 hours each for structured assignments and independent study
Credit points	:	4 SKS (6.4 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. Students are able to accurately analyze geophysical and electromagnetic variables (quantities and processes) from various geophysical and electromagnetic principles.; CLO 2. Students are able to apply geophysical data acquisition and model accurately;



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		CLO 3. Students are able to accurately analyze and interpret geophysical and electromagnetic data modeling; The following is the mapping of the ILO and the CLO of this course: <table><tr><td></td><td>ILO 4</td><td>ILO 8</td><td>ILO 11</td><td>ILO 13</td></tr><tr><td>CLO 1</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>CLO 2</td><td></td><td>✓</td><td></td><td></td></tr><tr><td>CLO 3</td><td></td><td></td><td>✓</td><td>✓</td></tr></table>		ILO 4	ILO 8	ILO 11	ILO 13	CLO 1	✓				CLO 2		✓			CLO 3			✓	✓										
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CLO 2		✓																														
CLO 3			✓	✓																												
Content	:	The Geophysical Methods course covers Resistivity Methods, SP Methods, IP Methods, and Electromagnetic Methods. Electromagnetic methods include GPR Methods, VLF Methods, TDEM Methods, FDEM Methods, MT Methods, AMT Methods, and CSAMT Methods.																														
Study and examination requirements	:	Participants are marked based on their performance in theory: Case Study (100%) 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><tr><td>65 - < 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - < 65</td><td>C+</td><td>2.5</td></tr><tr><td>50 - < 60</td><td>C</td><td>2.00</td></tr><tr><td>40 - < 50</td><td>D</td><td>1.00</td></tr><tr><td>< 40</td><td>E</td><td>0.00</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	65 - < 70	B-	2.75	60 - < 65	C+	2.5	50 - < 60	C	2.00	40 - < 50	D	1.00	< 40	E	0.00
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Exams and assessment formats	:	Assessment in this course is conducted entirely through case studies, designed to evaluate both theoretical understanding and practical application of CLO 1, CLO 2 and CLO 3. This work is developed over several weeks under instructor guidance, culminating in a written report and an oral presentation of results.
Reading list		Main References: 1. Blakely, Richard.J, 1995, Potential Theory in Gravity and Magnetic Application, Cambridge Univ. Press. 2. Dobrin, Milton. B., and Savit, C.H., 1998, Introduction to Geophysical Prospecting, McGraw-Hill, Inc. 3. Grant, F.S. and West, G.F., 1965, Interpretation Theory in Applied Geophysics, McGraw-Hill, Inc. 4. Reynolds, J.M., 1997, An Introduction to Applied and Environmental Geophysics, John Wiley & Sons. 5. Telford, M.W., Geldart, L.P., Sheriff, R.E. and Keys, D.A., 1991, Applied Geophysics, Cambridge Univ. Press. 6. Schön, J.H., 1996, Physical Properties of Rocks : Fundamentals and Principles of Petrophysics, Pergamon
Last revision date		July 1 st , 2025