



Bachelor Program in Geophysics

Faculty of Mathematics and Natural Sciences

HASANUDDIN UNIVERSITY

22. Geophysical Instrumentation

Module Name	:	Geophysical Instrumentation
Module Level	:	Bachelor
Code, if applicable	:	23H06121302
Subtitle, if applicable	:	-
Courses, if applicable	:	Geophysics
Semester(s) in which the module is taught	:	4 (Fourth Semester)
Module coordinator(s)	:	Dr. Samsu Arif, M.Si.
Lecturer(s)	:	Dr. Samsu Arif, M.Si. Andika, S.Si., M.Si.
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 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. Students are able to identify the concepts of analog and digital electronics and their applications in geophysics; CLO 2. Able to describe the basic principles of various types of instrumentation amplifiers and logic gate applications; The following is the mapping of the ILO and the CLO of this course:



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				ILO 7	ILO 8	ILO 13																														
			CLO 1	✓																																
			CLO 2		✓	✓																														
Content	:	1. Understanding analog and digital electronics and their applications in geophysics 2. Semiconductor diodes and bipolar transistor amplifiers 3. Operational amplifiers, types and applications 4. Decimal, octal, hexadecimal, and binary (digital) number systems and logic operations 5. Counters and timers, DAC, ADC																																		
Study and examination requirements		Participants are marked based on their performance in theory: Project/Case Study (80%), Written Examination (20%) Students are marked based on their percentage of points obtained and based on the following grade scale: <table><thead><tr><th>Percentage of Achievement</th><th>Grade</th><th>Conversion Value</th></tr></thead><tbody><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></tbody></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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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, a 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. The written examination (<i>closed-book</i> , written)																																		



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	evaluates students' understanding of fundamental concepts covered by CLO 1 and CLO 2.
Reading list	Main References: 1. Sutrisno 1986 " Elektronika Teori Dasar dan Penerapannya jilid 1 dan 2 " Penerbit ITB Bandung 2. Ronald.J.TocciDigital System 2002 Digital System Principles and Applivations "" Prentice/Hall International. Inc 3. Denton J Dailey 1989 " Operational Amplifiers and linier Intergrated Circuit Theory and Application " Mc Graw-Hill book Company Additional References: 1. Athur B.Williams ,1984 " Designer's Hand Book of integrated circuit "McGraw-hill Book Company 2. Robert L.Boylestad, Louis Nashelsky 1982" Electronic devices and Circuit Theory Third Eition "Prentice/Hall International Editions 3. F.Suryatmo 1989 " Teknik Digital" Bina kasara Jakrta
Last revision date	July 1 st , 2025