SEMESTER COURSE PLAN

HYDRO-OCEANOGRAPHIC SURVEY (P3) COURSES
(23H06122702)

TEACHING TEAM

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STUDI PROGRAM OF GEOPHYSICS - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY
MAKASSAR
2025

STUDY PROGRAM OF GEOFISIKA - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY

Vision

Become a program Reliable studies in the field of geophysics to produce superior graduates and mastering science, technology, arts and culture based on BMI in 2030.

Vision Strategy

Misson

Based on the Vision above, the Geophysics Study Program has a mission:

1. Improving the quality of education to produce graduates who are competitive, able to work independently and in groups in implementing and developing BMI science and technology;

2. Carrying out research to produce reliable and competitive scientific work oriented towards the scientific development of solid geophysics, marine geophysics, geoinformatics and hydro-meteorology;

3. Disseminate the results of applied research, action studies and appropriate technology packages in synergistic and accelerated productive activities to improve the quality of life of the community.

Graduate Profiles

Educators in the Field of Geophysics; meteorologist; geomaths; oceanographer; exploration geophysicist; seismologist ; geophysical entrepreneur.

PLO charged to courses

CPL-4 (P1) - Mastering theoretical concepts of land, sea and geophysics atmosphere, principles of exploration, and design exploration necessary for identification and mapping natural resources and natural disaster mitigation;

CPL-9 (KU2) - Able to demonstrate independent, quality and measurable performance in maintaining professional collaboration with supervisors and colleagues at national and international levels, as well as completing tasks responsibly using relevant modern geophysical tools

CPL-12 (KK2) - Able to discover new natural resources through a process of exploration, analysis, interpretation of data and information based on environmentally friendly exploration geophysical principles

Course Learning Outcomes (CLO)

CPMK-1: Able to plan a hydrooceanographic survey, carry out operations in the field, process data and apply data interpretation related to hydrooceanography and be able to develop skills in analyzing areas that require hydrooceanographic survey methods (CPL4, CPL9 dan CPL12)

Sub-CLO

Sub CPMK-1: Students analyze the composition of the material, learning methods and evaluations that will be carried out (CPMK-1)

Sub CPMK-2: Students analyze and can identify preparations for hydro-oceanographic surveys (CPMK-1)

Sub CPMK-3: Students analyze and can identify Geodetic and Hydrographic surveys (CPMK-1)

Sub CPMK-4: Students analyze and can identify Oceanographic surveys and Beach Bottom Sediment (CPMK-1)

Sub CPMK-5: Students analyze and can identify Maritime Geography and Maritime Meteorology surveys

(CPMK-1)

Sub CPMK-6: Students analyze and can carry out Hydrooceanographic Survey surveys (CPMK-1)

Sub CPMK-7: Students analyze and can carry out Hydrooceanographic Survey surveys (CPMK-1)

Sub CPMK-8: Students are able to apply Geodetic data processing and analysis (CPMK-1)

Sub CPMK-9: Students are able to apply hydrographic data processing and analysis (CPMK-1)

Sub CPMK-10: Students are able to apply oceanographic data processing and analysis (CPMK-1)

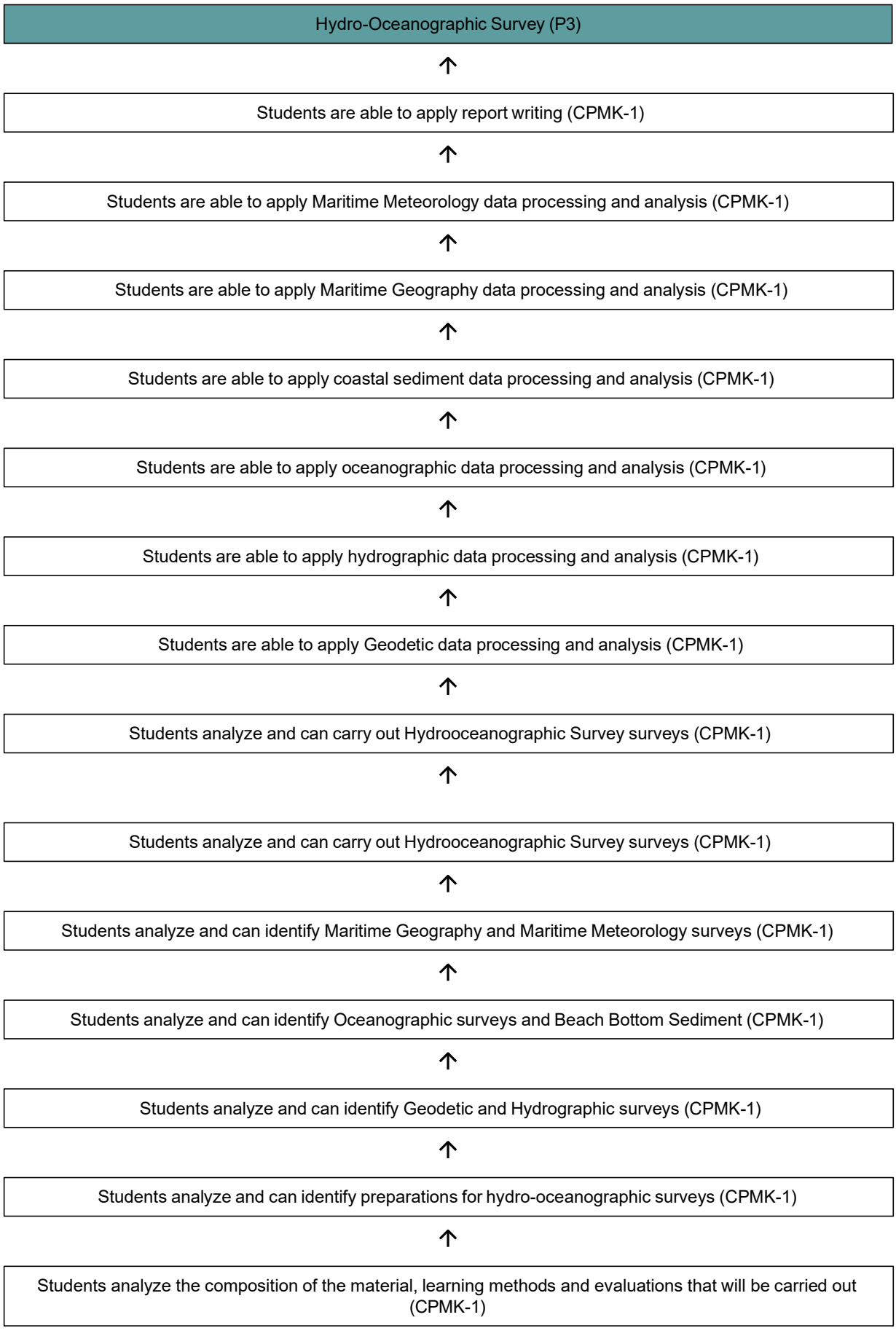
Sub CPMK-11: Students are able to apply coastal sediment data processing and analysis (CPMK-1)

Sub CPMK-12: Students are able to apply Maritime Geography data processing and analysis (CPMK-1)

Sub CPMK-13: Students are able to apply Maritime Meteorology data processing and analysis (CPMK-1)

Sub CPMK-14: Students are able to apply report writing (CPMK-1)

Learning Analytics



HASANUDDIN UNIVERSITY
FAKULTY OF MATHEMATICS AND NATURAL SCIENCES
STUDY PROGRAM OF GEOPHYSICS - S1
SEMESTER LEARNING PLAN

Course	Code	Cource Group	Credits	SEMESTER	Compilation Date
Hydro-Oceanographic Survey (P3)	23H06122702		2	4	1 Juli 2025

AUTHORITY	SLP Developer Lecturer	Coordinator	Head of Study Program
	Dr. Sakka, M.Si.	Dr. Sakka, M.Si.	Dr. Muhammad Alimuddin, Eng.

Learning Outcomes Course

SLOs that are imposed on the course	
SLO-4:	Menguasai konsep teoritis Geofisika darat, laut dan atmosfer, prinsip-prinsip eksplorasi, dan perancangan eksplorasi yang diperlukan untuk identifikasi dan pemetaan SDA serta mitigasi bencana alam;
SLO-9:	Mampu menunjukkan kinerja yang mandiri, berkualitas, dan terukur dalam menjaga kolaborasi profesional dengan pembimbing dan rekan kerja di tingkat nasional maupun internasional, serta menyelesaikan tugas secara bertanggung jawab dengan menggunakan perangkat geofisika modern yang relevan
SLO-12:	Mampu menemukan sumber Daya alam baru melalui proses eksplorasi, analisis, interpretasi data dan informasi berdasarkan prinsip-prinsip geofisika eksplorasi yang ramah lingkungan
SLO ⇒ Course Learning Outcomes	
After completing this course, it is expected:	
SLO-4	**CLO-1:** Able to plan a hydrooceanographic survey, carry out operations in the field, process data and apply data interpretation related to hydrooceanography and be able to develop skills in analyzing areas that require hydrooceanographic survey methods
SLO-9	**CLO-1:** Able to plan a hydrooceanographic survey, carry out operations in the field, process data and apply data interpretation related to hydrooceanography and be able to develop skills in analyzing areas that require hydrooceanographic survey methods
SLO-12	**CLO-1:** Able to plan a hydrooceanographic survey, carry out operations in the field, process data and apply data interpretation related to hydrooceanography and be able to develop skills in analyzing areas that require hydrooceanographic survey methods
CLO ⇒ Sub-CLO	
	Sub-CLO-1: Students analyze the composition of the material, learning methods and evaluations that will be carried out
	Sub-CLO-2: Students analyze and can identify preparations for hydro-oceanographic surveys
	Sub-CLO-3: Students analyze and can identify Geodetic and Hydrographic surveys
	Sub-CLO-4: Students analyze and can identify Oceanographic surveys and Beach Bottom Sediment
	Sub-CLO-5: Students analyze and can identify Maritime Geography and Maritime Meteorology surveys

	CLO-1	**Sub-CLO-6:**Students analyze and can carry out Hydrooceanographic Survey surveys
		Sub-CLO-7: Students analyze and can carry out Hydrooceanographic Survey surveys
		Sub-CLO-8: Students are able to apply Geodetic data processing and analysis
		Sub-CLO-9: Students are able to apply hydrographic data processing and analysis
		Sub-CLO-10: Students are able to apply oceanographic data processing and analysis
		Sub-CLO-11: Students are able to apply coastal sediment data processing and analysis
		Sub-CLO-12: Students are able to apply Maritime Geography data processing and analysis
		Sub-CLO-13: Students are able to apply Maritime Meteorology data processing and analysis
		Sub-CLO-14: Students are able to apply report writing

Correlation between SLOs/CLOs to Sub-CLOs

SLOs that are charged on the Course	CPMK	SUB CPMK	Form of Assessment*					Weight	Value	Student Score
			Formative	Sumative						
				Quiz	Project/Case Study	Task	Summative Test			
SLO-12	CLO-1	SUB-CLO-1	Participation	5	0	0	3	8		
SLO-12	CLO-1	SUB-CLO-2	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-3	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-4	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-5	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-6	Participation	0	5	0	0	5		
SLO-12	CLO-1	SUB-CLO-7	Participation	0	5	0	0	5		
SLO-12	CLO-1	SUB-CLO-9	Participation and Participation	0	10	0	0	10		
SLO-12	CLO-1	SUB-CLO-10	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-11	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-12	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-13	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-14	Participation	0	0	5	0	5		

SLOs that are charged on the Course	CPMK	SUB CPMK	Form of Assessment*				Weight	Value	Student Score
			Formative	Sumative					
				Quiz	Project/Case Study	Task	Summative Test			
				5	60	5	30	100		

Course Description	This course discusses how to implement data retrieval, processing and server services data analysis and interpretation of data in hydrooceanographic surveys.
Learning Materials/Subjects	1. Survey Geodetic 2. Survey Hydrography 3. Survey Beach Bottom Sediment 4. Survey Oceanography 5. Survey Maritime Geography 6. Survey Maritime Meteorology
Reference	**Main References**
	1. Febriawan, H. K., Haryadi, Y., & Nurwahyudy, A. (2020). Hydro-acoustic Survey and Edge-detection method in Investigation of a Passenger Vessel Accident in East Java, Indonesia. Marina Oceanographic Bulletin, 9(1), 59–68. https://doi.org/10.14710/buloma.v9i1.29442 2. Harsono G., and Hartoyo D., (2018), Hydro-Oceanographic Survey Basics**,** first edition**,** West Java, IPB Press, 3. UNESCO, 1996. Oceanographic Survey Techniques and Living Resources Assessment Methods IOC Manuals and Guides No. 32. Paris
	Additional References
	-
Teaching Team	Dr. Sakka, M.Si., Dr. Muhammad Alimuddin, Eng.
Course requirement	

Week	Sub CPMK (End-of-stage learning ability)	Penilaian (*Assesment*)		Learning Forms and Methods [time estimate]		Content	Weight of Assessment (%)
		Indicator	Techniques & Criteria	Offline	Online		
1	2	3	4	5	6	7	8

1	Students analyze the composition of the material, learning methods and evaluations that will be carried out (CPMK-1)	**Formative:** Accuracy in recognizing course material **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Quiz (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Group discussion (Small Group Discussion), Simulation (Role-Play & Simulation), Discovery Learning, Self-Directed Learning, Case Study, Project-based Learning 100		Contract Information and Learning Strategies survey hydrooceanography	5
2	Students analyze and can identify preparations for hydro-oceanographic surveys (CPMK-1)	**Formative:** The accuracy of applying concepts to answers about preparation hydrooceanographic survey **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Group discussion (Small Group Discussion), Simulation (Role-Play & Simulation), Discovery Learning, Self-Directed Learning, Case Study, Project-based Learning 100		Survey preparation	5
3	Students analyze and can identify Geodetic and Hydrographic surveys (CPMK-1)	**Formative:** The accuracy of applying concepts to answers about surveys Geodetic and Hydrographic **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Group discussion (Small Group Discussion), Simulation (Role-Play & Simulation), Discovery Learning, Case Study (Case Study), Project-Based Learning (Project-based Learning) 100		Geodetic and Hydrographic Surveys	5

4	Students analyze and can identify Oceanographic surveys and Beach Bottom Sediment (CPMK-1)	**Formative:** The accuracy of applying concepts to answers about surveys Oceanography and Beach Bottom Sediments **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Group discussion (Small Group Discussion), Simulation (Role-Play & Simulation), Self-Directed Learning, Case Study (Case Study), Project-Based Learning (Project-based Learning) 100		Survey Oceanography and Beach Bottom Sediments	5
5	Students analyze and can identify Maritime Geography and Maritime Meteorology surveys (CPMK-1)	**Formative:** The accuracy of applying concepts to answers about surveys Maritime and Maritime Meteorology **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Group discussion (Small Group Discussion), Discovery Learning, Case Study (Case Study), Project-Based Learning (Project-based Learning) 100		Geographic Survey Maritime and Maritime Meteorology	5
6	Students analyze and can carry out Hydrooceanographic Survey surveys (CPMK-1)	**Formative:** Accuracy in using survey equipment Hydrooceanography **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Response and Tutorial:** Simulation (Role-Play & Simulation), Discovery Learning, Self-Directed Learning, Case Study, Project-based Learning 100		Field Survey	5

7	Students analyze and can carry out Hydrooceanographic Survey surveys (CPMK-1)	**Formative:** Accuracy in using survey equipment Hydrooceanography **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 4 **Assessment Technique:** Non Test	**Studying:** Simulation (Role-Play & Simulation), Discovery Learning, Self-Directed Learning, Case Study, Project-based Learning 100		Field Survey	5
8	Written Examination						15
9	Students are able to apply hydrographic data processing and analysis (CPMK-1)	**Formative:** • Precision data processing and analysis Geodetic • Systematics fill in the Description **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Simulation (Role-Play & Simulation), Discovery Learning, Self-Directed Learning, Case Study, Project-based Learning 100		Geodetic data processing and analysis	5

10	Students are able to apply hydrographic data processing and analysis (CPMK-1)	**Formative:** • Precision data processing and analysis Hydrography • Systematics fill in the Description **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Simulation (Role-Play & Simulation), Discovery Learning, Case Study, Project-based Learning 100		Hydrographic data processing and analysis	5
11	Students are able to apply oceanographic data processing and analysis (CPMK-1)	**Formative:** • Precision data processing and analysis Oceanography ; • Systematics fill in the Description **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Simulation (Role-Play & Simulation), Case Study (Case Study), Project-Based Learning (Project-based Learning) 100		Oceanographic data processing and analysis	5
12	Students are able to apply coastal sediment data processing and analysis (CPMK-1)	**Formative:** • Precision Basic Sediment data processing and analysis Beach • Systematics fill in the Description **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Simulation (Role-Play & Simulation), Case Study (Case Study), Project-Based Learning (Project-based Learning) 100		Beach Bottom Sediment Data Processing and Analysis	5

13	Students are able to apply Maritime Geography data processing and analysis (CPMK-1)	**Formative:** • Precision Geography data processing and analysis Maritime • Systematics fill in the Description **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Response and Tutorial:** Simulation (Role-Play & Simulation), Discovery Learning, Case Study, Project-based Learning 100		Processing and Maritime Geography data analysis	5
14	Students are able to apply Maritime Meteorology data processing and analysis (CPMK-1)	**Formative:** • Precision Meteorological data processing and analysis Maritime • Systematics fill in the Description **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Project/Case Study (5) dinilai dengan rubrik 1 **Assessment Technique:** Non Test	**Studying:** Simulation (Role-Play & Simulation), Case Study (Case Study), Project-Based Learning (Project-based Learning) 100		Maritime Meteorological data processing and analysis	5
15	Students are able to apply report writing (CPMK-1)	**Formative:** • Precision writing survey reports hydrooceanography • Systematics fill in the Description **Sumative:** -	**Formative Criteria:** Participation dinilai dengan rubrik 1 **Sumative Criteria:** Task (5) dinilai dengan rubrik 2 **Assessment Technique:** Non Test	**Studying:** Self-Directed Learning, Case Study, Project-based Learning 100		-	5

16	Written Examination	15
		100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1
CPL-4 (P1)	Quiz (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 10%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Task (Weight 5%)

SLO / CLO	CLO-1
CPL-9 (KU2)	Quiz (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 10%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Task (Weight 5%)

SLO / CLO	CLO-1
CPL-12 (KK2)	Quiz (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 10%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 5%) Task (Weight 5%)

Evaluation Type and Assessment Weight

Type	Assessment Weight
Quiz	5
Project/Case Study	60
Task	5
Summative Test	30
Total	100

Assessment and Evaluation of Student Achievement of CLOs

SLOs that are charged on the Course	CLO	SUB CLO	Form of Assessment*					Weight	Value	Student Score
			Formative	Sumative						
				Quiz	Project/Case Study	Task	Summative Test			
SLO-12	CLO-1	SUB-CLO-1	Participation	5	0	0	3	8		
SLO-12	CLO-1	SUB-CLO-2	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-3	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-4	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-5	Participation	0	5	0	3	8		
SLO-12	CLO-1	SUB-CLO-6	Participation	0	5	0	0	5		
SLO-12	CLO-1	SUB-CLO-7	Participation	0	5	0	0	5		
SLO-12	CLO-1	SUB-CLO-9	Participation and Participation	0	10	0	0	10		
SLO-12	CLO-1	SUB-CLO-10	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-11	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-12	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-13	Participation	0	5	0	3.75	8.75		
SLO-12	CLO-1	SUB-CLO-14	Participation	0	0	5	0	5		
				5	60	5	30	100		

Lampiran Rubrik 1 | Rubrik Holistik

Tabel 6. 1 Rubrik Holistik

Grade Capaian	Skor	Uraian
Sangat Baik	≥ 85	Memperlihatkan pemahaman yang lengkap tentang permasalahan. Semua metode dan persyaratan tentang tugas terdapat dalam jawaban
Baik	71 - 84	Memperlihatkan cukup pemahaman tentang permasalahan. Semua persyaratan tentang tugas terdapat dalam jawaban
Cukup Baik	61 - 70	Memperlihatkan hanya sebagian pemahaman tentang permasalahan. Kebanyakan persyaratan tentang tugas terdapat dalam jawaban
Kurang	51 - 60	Memperlihatkan sedikit pemahaman tentang permasalahan. Banyak persyaratan tugas yang tidak ada
Sangat kurang	< 51	Memperlihatkan tidak ada pemahaman tentang permasalahan

Lampiran Rubrik 2 | Rubrik analitik makalah (kelompok atau individu)

Kriteria/Dimensi	**Penilaian mahasiswa**					**Nilai masing masing kriteria**
	Sangat baik	**Baik**	**Cukup**	**Kurang**	**Sangat kurang**	
	Skor≥ 85	**Skor 71 - 84**	**Skor 61 - 70**	**Skor 51 – 60**	**Skor 41 - 50**	
Sistematika Laporan – SL	laporan dibuat sesuai sistematika penulisan yang dijelaskan di detail tugas	laporan dibuat dengan benar tetapi kurang jelas	laporan dibuat cukup benar dan kurang jelas	laporan dibuat kurang benar dan kurang jelas	laporan dibuat dengan sistematika yang tidak sesuai yang diminta	10 %
Kelengkapan Laporan - KL	laporan dibuat secara lengkap sesuai petunjuk pembuatan laporan	laporan dibuat tanpa referensi dalam laporan	laporan dibuat tanpa referensi dalam laporan dan kesimpulan	laporan dibuat tanpa referensi dalam laporan, kesimpulan dan daftar pustaka	laporan dibuat tanpa referensi dalam laporan, kesimpulan, daftar pustaka dan lampiran yang diperlukan	20 $
Kejelasan dan keruntutan penulisan –JR	laporan jelas, dapat dipahami, ditulis secara runtut	laporan jelas, tetapi penulisan kurang runtut	laporan cukup jelas, cukup sesuai dengan keruntutan penulisan, tapi ada beberapa ketidak teraturan	laporan kurang jelas, kurang sesuai dengan keruntutan penulisan	laporan tidak jelas, tidak sesuai dengan keruntutan penulisan	20 %
Validitas Referensi – VR	Mencantumkan referensi yang valid di setiap paragraf, rumus, tabel dan gambar	Mencantumkan referensi yang valid tapi di beberapa paragraf, rumus, tabel dan gambar	Ada beberapa referensi yang kurang valid, walau lengkap tercantum di semua paragraf, rumus, tabel dan gambar	Lebih banyak referensi yang kurang valid, kurang tercantum di paragraf, rumus, tabel dan gambar	Tidak menggunakan referensi yang valid dan dominan tidak dicantumkan di setiap paragraf tabel, rumus dan gambar	20%
Kebenaran konsep ide yang dipaparkan – KI	konsep/ide yang dipaparkan tepat, benar, dan sesuai dengan teori	konsep/ide yang dipaparkan sesuai dengan teori tetapi kurang jelas	konsep/ide yang dipaparkan cukup	konsep/ide yang dipaparkan kurang tepat	konsep/ide yang dipaparkan tidak tepat	30 %

Lampiran Rubrik 4 | Rubrik Praktikum

Tabel 6. 4 Rubrik Praktikum

Kegiatan	:	Mahasiswa mampu melaksanakan kegiatan Praktikum sesuai Modul Percobaan yang diberikan.	
Kriteria Penilaian	:	1. Penyediaan alat dan bahan	10 %
		2. Merangkai alat dan bahandengan benar, rapi dan memperhatikan keselamatan kerja	10 %
		3. Pengamatan/Pengambilan Data percobaan	20 %
		4. Pengolahan data hasil percobaan 5. Menyimpulkan hasil percobaan	20 % 10 %
		6. Penyusunan laporan hasi lpercobaan dalam bentuk tulisan yang rapi	30 %

Kriteria/ Dimensi	**Penilaian mahasiswa**				
	Sangat Baik	**Baik**	**Cukup**	**Kurang**	**Sangat kurang**
	Skor≥ 85	**Skor 71 - 84**	**Skor 61 - 70**	**Skor 51 – 60**	**Skor 41 - 50**
Penyediaan alat dan bahan	Menyiapkan alat dan bahan dengan rapi dan lengkap serta mengembalikannya dalam keadaan lengkap dan baik	Menyiapkan alat danbahan dengan rapi dan lengkap serta mengembalikannya dengan lengkap namun keadaannya kurang rapi	Menyiapkan alat dan bahan dengan lengkap dan rapi, namun tidak mengembalikannya dalam keadaan lengkap dan baik	Menyiapkan alat dan bahan dengan lengkap namun tidak rapi serta mengembalikannya dalam keadaan tidak lengakap dan dalam keadaaan kurang baik	Tidak menyiapkan alat dan bahan praktikum

Merangkai alat dan bahan dengan benar, rapi dan memperhatikan keselamatan kerja	Rangkaian alat benar, rapi, dan memperhatikan keselamatan	Rangkaian alat benar, rapi, dan memperhatikan keselamatan kerja	Rangkaian alat benar, rapi namun tidak memperhatikan keselamatan kerja	Rangkaian alat benar, tetapi tidak rapi	Rangkaian alat tidak benar
Pengamatan/Pengambilan Data	cermat, tepat dan bebas interpretasi	cermat, tidak mengandung tidak tepat	cermat, tepat tetapi mengandung interpretasi	tidak cermat, kurang tepat	tidak cermat, tidak tepat (salah)
Pengolahan data hasil percobaan					
Menyimpulkan hasil percobaan	Kesimpulan sesuai tujuan, singkat, dan logis	Kesimpulan sesuai tujuan, singkat, ada kesimpulan yangtidak sesuai tujuan	Kesimpulan sesuai tujuan, sebagian kesimpulan tidak sesuaitujuan, terlalu panjang	Tidak benar atau tidak sesuai tujuan	Tidak menyimpulkan hasil percobaan
Penyusunan laporan hasil percobaan dalam bentuk tulisan yang rapi	Laporan disajikan/tersusun sistimatis, jelas, dan lengkap serta rapi	Laporan disajikan/tersusun sistimatis, jelas, dan lengkap namun tidak rapi	Laporan disajikan/tersusun kurang sistimatis, kurrang jelas namun lengkap	Laporan disajikan/tersusun tidak sistimatis, tidak jelas, dan tidak lengkap	Tidak membuat laporan