

SEMESTER COURSE PLAN

**WEATHER AND CLIMATE (P2) COURSES
(23H06122302)**



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

Mission

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-7 (P4) - Master the principles and current issues of natural disasters and how to mitigate disaster risks

CPL-10 (KU3) - Able to make the right decisions in solving problems, verifying information, and analyzing data in the field of applied geophysics—especially in land use studies and environmental studies—by using modern geophysical analysis and computing tools based on the results of information and data analysis, to carry out the process of evaluating, documenting, and rediscovering data to ensure validity and prevent plagiarism

CPL-13 (KK3) - Able to formulate alternative solutions to solve disaster mitigation problems by taking into account public safety, social and environmental factors

Course Learning Outcomes (CLO)

CPMK-1: Able to understand weather and climate instruments and access weather and climate data from world climate sites; (CPL7)

CPMK-2: Able to link triggers and disasters due to weather and climate; (CPL10)

CPMK-3: Able to carry out effective disaster mitigation according to environmental and social triggers and conditions (CPL13)

Sub-CLO

Sub CPMK-1: Able to handle Weather Station and acquire weather and climate data (SubCPMK1) (CPMK-1)

Sub CPMK-2: Able to access and download weather and climate data from the climate data website (SubCPMK2) (CPMK-1)

Sub CPMK-3: Able to operate and acquire weather data (in-situ and satellite) (SubCPMK3) (CPMK-1)

Sub CPMK-4: Able to analyze the link between ENSO and drought/floods (SubCPMK4) (CPMK-2)

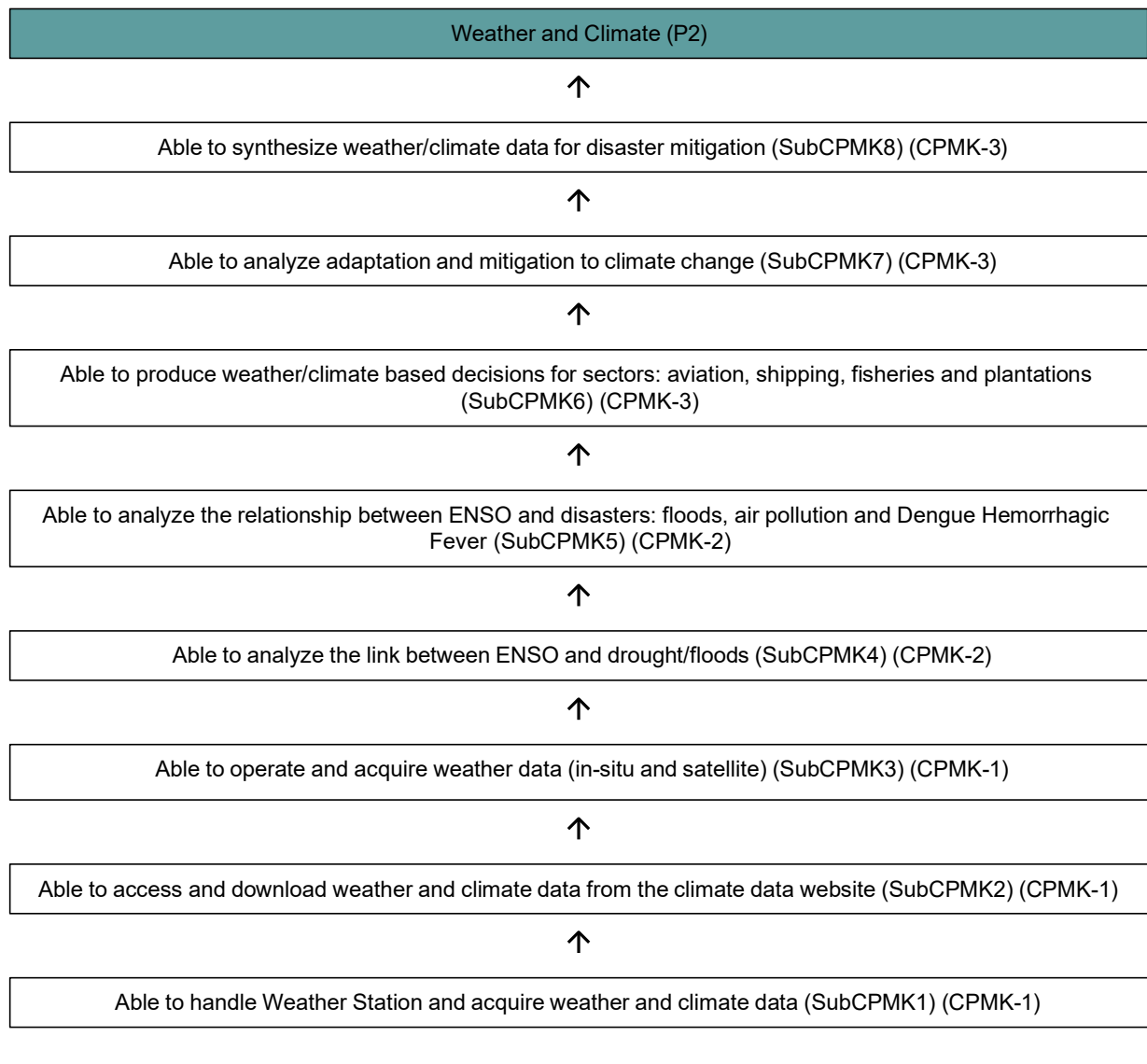
Sub CPMK-5: Able to analyze the relationship between ENSO and disasters: floods, air pollution and Dengue Hemorrhagic Fever (SubCPMK5) (CPMK-2)

Sub CPMK-6: Able to produce weather/climate based decisions for sectors: aviation, shipping, fisheries and plantations (SubCPMK6) (CPMK-3)

Sub CPMK-7: Able to analyze adaptation and mitigation to climate change (SubCPMK7) (CPMK-3)

Sub CPMK-8: Able to synthesize weather/climate data for disaster mitigation (SubCPMK8) (CPMK-3)

Learning Analytics





HASANUDDIN UNIVERSITY

FAKULTY OF MATHEMATICS AND NATURAL SCIENCES

STUDY PROGRAM OF GEOPHYSICS - S1

SEMESTER LEARNING PLAN

Course		Code	Course Group	Credits	SEMESTER	Compilation Date
Weather and Climate (P2)		23H06122302		2	4	1 Juli 2025
AUTHORITY		SLP Developer Lecturer		Coordinator		Head of Study Program
		Prof. Dr. Halmar Halide, M.Sc.		Prof. Dr. Halmar Halide, M.Sc.		Dr. Muhammad Alimuddin, Eng.
Learning Outcomes Course	SLOs that are imposed on the course					
	SLO-7:	Menguasai prinsip dan issue terkini bencana alam dan bagaimana memitigasi resiko bencana				
	SLO-10:	Mampu mengambil keputusan yang tepat dalam memecahkan masalah, memverifikasi informasi, dan menganalisis data pada bidang geofisika terapan—khususnya dalam kajian tata guna lahan dan studi lingkungan—dengan menggunakan perangkat analisis dan komputasi geofisika modern berdasarkan hasil analisis informasi dan data, untuk melaksanakan proses evaluasi, pendokumentasian, serta penemuan kembali data guna menjamin validitas dan mencegah plagiasi				
	SLO-13:	Mampu merumuskan alternatif solusi untuk menyelesaikan masalah mitigasi bencana dengan memperhatikan faktor-faktor keselamatan publik, sosial dan lingkungan				
	SLO ⇒ Course Learning Outcomes					
	After completing this course, it is expected:					
	SLO-7	CLO-1: Able to understand weather and climate instruments and access weather and climate data from world climate sites;				
	SLO-10	CLO-2: Able to link triggers and disasters due to weather and climate;				
	SLO-13	CLO-3: Able to carry out effective disaster mitigation according to environmental and social triggers and conditions				
	CLO ⇒ Sub-CLO					
	CLO-1	Sub-CLO-1:Able to handle Weather Station and acquire weather and climate data (SubCPMK1)				
		Sub-CLO-2:Able to access and download weather and climate data from the climate data website (SubCPMK2)				
		Sub-CLO-3:Able to operate and acquire weather data (in-situ and satellite) (SubCPMK3)				
	CLO-2	Sub-CLO-4:Able to analyze the link between ENSO and drought/floods (SubCPMK4)				
		Sub-CLO-5:Able to analyze the relationship between ENSO and disasters: floods, air pollution and Dengue Hemorrhagic Fever (SubCPMK5)				
		Sub-CLO-6:Able to produce weather/climate based decisions for sectors: aviation, shipping, fisheries and plantations (SubCPMK6)				

	CLO-3	Sub-CLO-7:Able to analyze adaptation and mitigation to climate change (SubCPMK7)							
		Sub-CLO-8:Able to synthesize weather/climate data for disaster mitigation (SubCPMK8)							
	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					
				Practicum	Task	Project/Case Study			
SLO-7	CLO-1	SUB-CLO-1	Participation	10	5	0	15		
SLO-7	CLO-1	SUB-CLO-2	Participation	0	0	5	5		
SLO-7	CLO-1	SUB-CLO-3	Participation	0	5	10	15		
SLO-10	CLO-2	SUB-CLO-4	Participation	0	5	5	10		
SLO-10	CLO-2	SUB-CLO-5	Participation	0	5	10	15		
SLO-13	CLO-3	SUB-CLO-6	Participation	0	5	10	15		
SLO-13	CLO-3	SUB-CLO-7	Participation	0	0	10	10		
SLO-13	CLO-3	SUB-CLO-8	Participation	0	0	15	15		
				10	25	65	100		
Course Description	This lecture contains: access to weather and climate data from world meteorological, climate, marine and space institutions; instrument collection of weather/climate data in-situ and via satellite; the relationship between weather and climate with rain, air pollution and dengue fever incidence and implications climate change. The lecture will end with a Final Exam/Project.								
Learning Materials/Subjects	1. Access weather and climate data on the world climate website 2. Relatedness weather and climate phenomena with a number of events (disasters) on society 3. Mitigation events (disasters) caused by weather and climate								
Reference	Main References								
	Moran, J. M. (2012). <i>Weather Studies</i> (5 th ed). American Meteorological Society, USA.								
	World Meteorological Organization (2008). <i>Guide to Meteorological Instruments and Methods of Observation</i> (7 th ed.). Switzerland: WMO-No. 8								
	Additional References								

Behringer, W. (2010). <i>A Cultural History of Climate</i>. Cambridge: Polity Press. Fagan, B. (2001). <i>The Little Ice Age: How Climate Was Made History 1300-1850</i>. New York: Basic Books. Fagan, B. (2004). <i>The Long Summer: How the Climate Changed Civilization</i>. New York: Basic Books.							
Teaching Team		Prof. Dr. Halmar Halide, M.Sc., Andika, S.Si., M.Si.					
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
1-2	Able to handle Weather Station and acquire weather and climate data (SubCPMK1) (CPMK-1)	Formative: Accuracy in using the weather station and acquiring weather and climate data Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Practicum (10) dinilai dengan rubrik 4 Task (5) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Case Study, Collaborative Learning 100 Response and Tutorial: Simulation (Role-Play & Simulation) 100		AWS, Weather and climate coverage	15

3	Able to access and download weather and climate data from the climate data website (SubCPMK2) (CPMK-1)	Formative: Inner tightness obtain weather and climate data 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) 100		Access world weather and climate data	5
4-6	Able to operate and acquire weather data (in-situ and satellite) (SubCPMK3) (CPMK-1)	Formative: Precision in operate and acquire weather data Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Task (5) dinilai dengan rubrik 1 Project/Case Study (10) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Group discussion (Small Group Discussion), Case Study (Case Study) 100 Response and Tutorial: Case Study, Collaborative Learning 100 Response and Tutorial: Simulation (Role-Play & Simulation) 100		Weather data acquisition	15

7	Able to analyze the link between ENSO and drought/floods (SubCPMK4) (CPMK-2)	Formative: Precision in analyzing Enso data and drought disasters Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Task (5) dinilai dengan rubrik 2 Project/Case Study (5) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Group discussion (Small Group Discussion), Self-Directed Learning, Case Study (Case Study) 100		The relationship between ENSO and disasters	10
8-10	Able to analyze the relationship between ENSO and disasters: floods, air pollution and Dengue Hemorrhagic Fever (SubCPMK5) (CPMK-2)	Formative: Precision in analyzing Enso data and the dengue disaster Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (10) dinilai dengan rubrik 2 Task (5) dinilai dengan rubrik 1 Assessment Technique: Non Test	Studying: Group discussion (Small Group Discussion), Discovery Learning, Self-Directed Learning, Case Study (Case Study) 300		The relationship between ENSO and disasters	15

11-14	Able to produce weather/climate based decisions for sectors: aviation, shipping, fisheries and plantations (SubCPMK6) (CPMK-3)	Formative: Accuracy in formulating weather-based decisions and climate for the maritime and aviation sectors Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Task (5) dinilai dengan rubrik 1 Project/Case Study (10) dinilai dengan rubrik 2 Assessment Technique: Non Test	Studying: Group discussion (Small Group Discussion), Simulation (Role-Play & Simulation), Discovery Learning, Self-Directed Learning, Case Study (Case Study) 300		Weather/climate based decision making	15
15	Able to analyze adaptation and mitigation to climate change (SubCPMK7) (CPMK-3)	Formative: Precision in formulate weather and climate disaster mitigation Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (10) 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 (Case Study) 100		Climate Change	10
16	Able to synthesize weather/climate data for disaster mitigation (SubCPMK8) (CPMK-3)	Formative: Accuracy in synthesizing weather/climate data for decision making in the face of disasters Sumative: -	Formative Criteria: Participation dinilai dengan rubrik 1 Sumative Criteria: Project/Case Study (15) dinilai dengan rubrik 2 Assessment Technique: Non Test	Research, Design, or Development: Discovery Learning, Self-Directed Learning, Case Study 100		Final project on weather/climate disaster mitigation	15

	100
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Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2	CLO-3
CPL-7 (P4)	Practicum (Weight 10%) Task (Weight 5%) Project/Case Study (Weight 5%) Task (Weight 5%) Project/Case Study (Weight 10%)		
CPL-10 (KU3)		Task (Weight 5%) Project/Case Study (Weight 5%) Project/Case Study (Weight 10%) Task (Weight 5%)	
CPL-13 (KK3)			Task (Weight 5%) Project/Case Study (Weight 10%) Project/Case Study (Weight 10%) Project/Case Study (Weight 15%)

Evaluation Type and Assessment Weight

Type	Assessment Weight
Practicum	10
Task	25
Project/Case Study	65
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					
				Practicum	Task	Project/Case Study			
SLO-7	CLO-1	SUB-CLO-1	Participation	10	5	0	15		
SLO-7	CLO-1	SUB-CLO-2	Participation	0	0	5	5		
SLO-7	CLO-1	SUB-CLO-3	Participation	0	5	10	15		
SLO-10	CLO-2	SUB-CLO-4	Participation	0	5	5	10		
SLO-10	CLO-2	SUB-CLO-5	Participation	0	5	10	15		
SLO-13	CLO-3	SUB-CLO-6	Participation	0	5	10	15		
SLO-13	CLO-3	SUB-CLO-7	Participation	0	0	10	10		
SLO-13	CLO-3	SUB-CLO-8	Participation	0	0	15	15		
				10	25	65	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	20 %
	:	5. Menyimpulkan hasil percobaan	10 %
	:	6. Penyusunan laporan hasil percobaan 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 dan bahan 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 lengkap dan dalam keadaan 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 yang tidak sesuai tujuan	Kesimpulan sesuai tujuan, sebagian kesimpulan tidak sesuai tujuan, 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, kurang jelas namun lengkap	Laporan disajikan/tersusun tidak sistimatis, tidak jelas, dan tidak lengkap	Tidak membuat laporan