



UNIVERSITAS PENDIDIKAN INDONESIA

SEMESTER LEARNING PLAN (RPS)

COURSE IDENTITY

Course Name	Course Code	Credits	Workload	Course Group	Semester	Prerequisite Course	Date of Issue
METEOROLOGI KLIMATOLOGI DAN HIDROLOGI	SA224	4	180	Study Program Skill Development (PKPS)	2		2025-02-26 13:29:04

Prepared by Course Lecturer	Reviewed by Study Program Quality Assurance Team	Approved by Head of Study Program
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COURSE DESCRIPTION AND PROGRAM LEARNING OUTCOMES

Course Description	Meteorology, Climatology, and Hydrology is a course designed to develop professional competencies within the study program.		
Program Learning Outcomes (PLO) Addressed by the Course	1	Able to master theoretical concepts of geography and the application of geospatial technology to solve geosphere-related problems, as well as to develop models and methods for addressing geosphere issues.	
	2	Able to integrate learning and innovation skills, mastery of technology and information, career development, and life skills in order to become lifelong learners.	
	3	Able to design, develop, produce, utilize, control, and evaluate spatial information analysis models and theories based on science and technology.	
Course Learning Outcomes (CPMK)	1	S4: Demonstrates the role of a citizen who is proud of and loves the homeland, possessing nationalism and a sense of responsibility toward the nation and the state.	
	2	P1: Able to master theoretical concepts of geography and the application of geospatial technology to solve geosphere-related problems, and to develop models and methods for solving geosphere issues.	
	3	KU3: Able to prepare scientific descriptions of the results of the above studies in the form of a thesis or final project report and upload them to the university website.	
	4	KK1: Able to design, develop, produce, utilize, control, and evaluate spatial information analysis models and theories based on science and technology.	
Sub-CPMK	1	CPMK - 1	Understand the theories and basic concepts of the atmosphere and its dynamics.
	2	CPMK - 2	Analyze natural phenomena, particularly in the fields of meteorology and climatology
	3	CPMK - 2	Analyze weather and climate elements and their measurement instruments.
	4	CPMK - 2	Explain climate theories and various climate classifications.
	5	CPMK - 4	Able to analyze the causes and impacts of global warming and climate change on life.
	6	CPMK - 2	Able to analyze the ENSO phenomenon and its impacts on the Indonesian region.
	7	CPMK - 3	Students are able to understand the scope of hydrological studies and their contributions to geography.
	8	CPMK - 2	Students are able to explain watersheds (DAS), groundwater concepts, and infiltration.
	9	CPMK - 4	Students are able to apply hydrological studies and their contributions to geography.
	10	CPMK - 4	Students are able to analyze hydrological studies, their contributions to geography, and their benefits in daily life.

	11	CPMK - 3	Students are able to understand the concept of groundwater.
	12	CPMK - 2	Field practicum.
	13	CPMK - 2	Dynamics of air pressure, the process of wind formation, and types of wind.
	14	CPMK - 2	The theory of air humidity, evaporation and transpiration, and rainfall distribution.
Course Materials	1	Definition and basic concepts of the dynamics of the Earth's atmosphere.	
	2	Earth’s movements and changes in weather and climate.	
	3	Elements of weather and climate and their measurement methods.	
	4	Radiation theory, temperature distribution, and adiabatic processes.	
	5	Dynamics of air pressure, the process of wind formation, and types of wind.	
	6	The theory of air humidity, evaporation and transpiration, and rainfall distribution.	
	7	Climate classification, global warming, and ENSO.	
	8	Field practicum.	
	9	Introduction to hydrology, its scope, and the distribution of water on the Earth's surface.	
	10	Structures and types of river flow observation stations (SPAS).	
	11	Calculation and estimation approaches for river discharge.	
	12	Theories, concepts, and calculations of infiltration, percolation, and permeability.	
	13	Approaches and calculations of potential and actual water availability in a watershed (DAS).	
	14	Determination of groundwater flow direction, calculation of groundwater discharge, and analysis of groundwater potential.	
Learning outcomes that can be demonstrated with evidence at the end of the course	A report on the analysis of meteorological, climatological, and hydrological data obtained from field observations.		
Learning Strategy		Case Method	
	✓	Team based Project	
		Others	

Learning Steps	The lectures are conducted through the following methods: 1. Face-to-face/online lectures (Hybrid). 2. Assignments and quizzes. 3. Midterm examination (UTS). 4. Field practicum. 5. Final examination (UAS). Important notes for students: 1. Students must attend more than 80% of the lecture sessions. 2. The course will consist of 70% theory and 30% practice. 3. Students are required to access the e-learning platform at spada.upi.edu.	
References	1	Ahrens, C. Donald. 2003, Meteorology Today, An Introdustion To Weather, Climate, and The Environment, Seventh Edition, Thomson, Brooks/Cole, Australia.
	2	Barry, Roger G, and Chorley, Richard J. 2003. Atmosphere, Weather, and Climate. New York: Routledge
	3	Critchfield, Howard J., (1979). General Climatology. Prentice Hall India
	4	Dengel, G.O.F., (1956). Dasar-Dasar Ilmu Cuaca, J.B. Wolters Jakarta, 1956 Doorenbos, J., and W.O. Pruitt, 1977. Guidelines for Predicting Crop Water Requirements. Food and Agriculture Organization of United Nations, Rome Fontanel dan Chantefort, 1978. Bioclimat du Monde Indonesian (Bioclimate of Indonesian Archipelago). Ha161-78
	5	Rafi'i, Suryatna , 1995. Meteorologi dan Klimatologi. Angkasa – Bandung
	6	Mather, J.R. 1974. Climatology, Fundamental and Applications, McGraw Hill Book Company, New York.
	7	Neiburger, Morris. 1995. Memahami Atmosfer Kita. Bandung: Penerbit ITB
	8	Trewartha, G.T., Horn, Lyle H. 1995. Pengantar Iklim.Edisi Kelima. Gadjah Mada University Press: Yogyakarta
	9	Utomo, Dwiyono Hari. 2016. Meteorologi Klimatologi. Magnum: Yogyakarta
	10	Asdak Chay (1995). Hidrologi dan Pengeloaan daerah Aliran Sungai. Yogyakarta: Gadjah Mada Press.
	11	Black, Peter E., (1991), Watershed Hydrology, Prentice Hall, Englewood Cliffs, New Jersey.
	12	Freeze R. Allan, John A. Cherry (1979), Groundwater, Englewood Cliffs, New Jersey.
	13	Hermawan Yandi, Hidrologi untuk Insinyur, hal. 1-6.
	14	Kodoatie, R.J. dan Roestam Sjarief. (2005). Pengelolaan Sumber Daya Air Terpadu. Yogyakarta: Andi
	15	Linsley Ray K., Joseph B. Franzini, (1985), Teknik Sumber Daya Air, Eralanga, Jakarta
	16	Soewarno, (1991), Pengukuran dan Pengolahan Data Aliran Sungai (Hidrometri), Nova, Bandung
	17	Soemarto,(1999), Hidrologi Teknik, Penerbit Erlangga, Jakarta.
	18	Todd, (1983), Introduction to Hydrology. Mc Graw Hill. USA

LEARNING PLAN

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement that can be demonstrated by students	Lecture Materials	Assessment		Form and learnin methods		Duration (hours)	Reference Number	Access Time
				Form of Assessment (test / non-test)	Assessment Weight (%)	Synchronous (face-to-face and virtual meetings)	Asynchronous (individual assignments and group assignments))			
1	Understanding the theory and basic concepts of the atmosphere and its dynamics.	Students are able to explain the basic concepts of the atmosphere and its dynamics.	Definition and basic concepts of the dynamics of the Earth's atmosphere.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	1,2,5	03-02-2025 07:00
2	Analyzing natural phenomena, particularly in the fields of meteorology and climatology.	Students are able to explain the Earth's motion and changes in weather and climate.	Earth's motion and changes in weather and climate.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	1,3,4	10-02-2025 07:00
3	Analyzing the elements of weather and climate and their measurement instruments.	Students are able to analyze the elements of weather and climate and their measuring instruments.	Elements of weather and climate and their measurement methods.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	1,4,5	17-02-2025 07:00
4	Analyzing natural phenomena, particularly in the fields of meteorology and climatology.	1.Apply the theories of meteorology and climatology that have been studied; 2. Students are able to measure elements of weather and climate in the field.	Radiation Theory, Temperature Distribution, and Adiabatic Processes.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	2,5,7	24-02-2025 07:00

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement that can be demonstrated by students	Lecture Materials	Assessment		Form and learnin methods		Duration (hours)	Reference Number	Access Time
				Form of Assessment (test / non-test)	Assessment Weight (%)	Synchronous (face-to-face and virtual meetings)	Asynchronous (individual assignments and group assignments)			
5	Able to analyze the causes and impacts of global warming and climate change on life.	Students are able to explain the theory and types of winds.	Dynamics of air pressure, the process of wind formation, and types of wind.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	2,5	03-03-2025 07:00
6	Able to analyze the ENSO phenomenon and its impacts on the Indonesian region.	1.Students are able to explain climate theory; 2. Students are able to classify the climate of a region based on the Köppen, Junghuhn, Oldeman, and Schmidt–Ferguson classification systems.	Theory of air humidity, evaporation and transpiration, and the distribution of rainfall.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	3,4,8	10-03-2025 07:00
7	Students are able to understand the scope of hydrology studies and their contribution to geography.	Students are able to understand the causes and impacts of ENSO on life.	Climate classification, global warming, and ENSO.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	6,8,9	17-03-2025 07:00
8	UTS				18					24-03-2025 07:00

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement that can be demonstrated by students	Lecture Materials	Assessment		Form and learnin methods		Duration (hours)	Reference Number	Access Time
				Form of Assessment (test / non-test)	Assessment Weight (%)	Synchronous (face-to-face and virtual meetings)	Asynchronous (individual assignments and group assignments)			
9	Students are able to understand the scope of hydrology studies and their contribution to geography.	Students are able to understand the scope of hydrology studies.	Definition of hydrology, its scope, and the distribution of water on the Earth's surface.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Understand the material and answer quizzes/questions on spada.upi.edu.	180	10,11,18	11-04-2025 07:32
10	Students are able to explain watersheds, groundwater concepts, and infiltration.	Students are able to explain the basic concepts of watersheds, watershed morphometry, and the basic concepts of groundwater.	Approaches and calculations of potential and actual water availability in a watershed.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Independent exploration of the material.	180	10,11,13	17-04-2025 07:01
11	Students are able to understand the scope of hydrology studies and their contribution to geography.	Students are able to explain the various types of river discharge observation stations (SPAS).	Structures and types of river discharge observation stations (SPAS).	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Independent exploration of the material.	180	11,14,15	24-04-2025 07:00
12	Students are able to understand the scope of hydrology studies and their contribution to geography.	Students are able to measure river and spring discharge using various methods.	Calculations and approaches for estimating river discharge.	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	15,17,18	30-04-2025 07:00

Week	Sub-CPMK	Indicators of Sub-CPMK Achievement that can be demonstrated by students	Lecture Materials	Assessment		Form and learnin methods		Duration (hours)	Reference Number	Access Time
				Form of Assessme nt (test / non-test)	Assessmen t Weight (%)	Synchrono us (face-to-face and virtual meetings)	Asynchronous (individual assignments and group assignments)			
13	Students are able to explain watersheds, groundwater concepts, and infiltration.	Students are able to apply methods for measuring infiltration, percolation, and permeability.	Theory, Concepts, and Calculations of Infiltration, Percolation, and Permeability	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	12,15,17,18	08-05-2025 07:00
14	Field practicum	Students are able to apply the theories and concepts studied in the field.	Field Practicum	Performance	51	Field Practicum	Field survey and data collection	180	1,3,4,5,6,10,11,12,15,16	15-05-2025 07:00
15	Students are able to understand the concept of groundwater.	Students are able to understand the concept of aquifers and determine the direction of groundwater flow using a flownet.	Determination of Groundwater Flow Direction, Calculation of Groundwater Discharge, and Analysis of Groundwater Potential	Participatory	1	Face-to-face learning using the expository method and question-and-answer.	Assignment	180	12,16,18	22-05-2025 07:00
16	UAS				18					26-05-2025 07:00

WAKTU BELAJAR MAHASISWA (WORKLOAD)

	ACTIVITIES	SYNCHRONOUS (Face-to-Face / Virtual)	ASYNCHRONOUS (Structured / Independent)	STUDENT LEARNING PREPARATION	TOTAL STUDENT LEARNING AND STUDY TIME
LEARNING	Lectures/Recitations/Tutorials	14 x 180 minutes = 2520 minutes	14 x 40 minutes = 560 minutes	14 x 20 minutes = 280 minutes	3360 minutes (56.0 hours)
	Project-Based Learning	2 x 500 minutes = 1000 minutes	2 x 500 minutes = 1000 minutes	2 x 60 minutes = 120 minutes	2120 minutes (35.3 hours)
	Discussion (Case-Based Learning)	-x-	-x-	-x-	0 minutes (0.0 hours)
	TOTAL				5480 minutes (91.3 hours)
ASSESSMENT	Continuous Assessment				
	Participation During Learning	14 x 60 minutes = 840 minutes	14 x 60 minutes = 840 minutes	14 x 30 minutes = 420 minutes	2100 minutes (35.0 hours)
	Project Completion	4 x 250 minutes = 1000 minutes	4 x 250 minutes = 1000 minutes	4 x 35 minutes = 140 minutes	2140 minutes (35.7 hours)
	Assignments	-x-	14 x 30 minutes = 420 minutes	-x-	420 minutes (7.0 hours)
	Quizzes	-x-	14 x 30 minutes = 420 minutes	-x-	420 minutes (7.0 hours)
	Formative				120 minutes (2.0 hours)
	Summative				120 minutes (2.0 jam)
	TOTAL				5320 minutes (88.7 hours)
TOTAL WORKLOAD					10800 minutes (180 hours)
IDEAL NUMBER OF HOURS					180 Hours
CREDIT UNITS (SKS)					4
ALIGNMENT WITH THE NUMBER OF CREDIT UNITS					ALIGNED

CPMK ASSESSMENT CRITERIA

No	CPMK	CPL			TAXONOMY	Weight	CPMK ACHIEVEMENT CRITERIA
		CPL-1	CPL-2	CPL-3			
1	S4 acts as a citizen who is proud of and loves the homeland, possesses nationalism, and has a sense of responsibility toward the country and nation.				2	1	70% of all students achieve a minimum score of 70 (on a 100-point scale).
2	P1 is able to master theoretical concepts of geography, apply geospatial technology to solve geosphere problems, and develop models and methods for geosphere problem-solving.				4	57	70% of all students achieve a minimum score of 70 (on a 100-point scale).
3	KU3 is able to compile a scientific description of the above study results in the form of a thesis or final project report and upload it to the university portal.				5	5	70% of all students achieve a minimum score of 70 (on a 100-point scale).
4	KK1 is able to design, develop, produce, utilize, control, and evaluate models of analysis and spatial information theories based on science and technology.				5	1	70% of all students achieve a minimum score of 70 (on a 100-point scale).

COLLABORATIVE ASSIGNMENT DESIGN

ASSIGNMENT TITLE	1. Analysis of the correlation between the dynamics of weather and climate elements and elevation differences (thermometric gradient) 2. Measurement of Flow Discharge, Infiltration, and Groundwater Potential
LEARNING METHOD	Team based Project
DURATION	
ASSESSMENT WEIGHT	50
SUB-CPMK	Students are able to analyze hydrology studies and their contributions to geography, as well as their benefits for everyday life

TASK DESCRIPTION
1. Students conduct an analysis of the correlation between weather data obtained from field measurements and elevation differences along a mountain/mountain range toposequence. Additionally, students carry out a survey and measurement of flow discharge, infiltration, and groundwater potential within an aquifer.
TASK PROCEDURE
1. Students are divided into several groups. 2. The groups are distributed across plots along the mountain/mountain range toposequence based on elevation differences. 3. Students measure weather elements using measuring instruments at their respective plots. 4. Students analyze the correlation between the dynamics of weather and climate elements and elevation differences. 5. Students conduct a survey and measurement of flow discharge, infiltration, and groundwater potential within an aquifer. 6. Students prepare a report of the practicum results.
TASK PROCEDURE
Field practicum report
INDICATORS, CRITERIA, AND ASSESSMENT WEIGHT

1. Students perform measurement techniques CORRECTLY, conduct analysis CORRECTLY, and prepare the practicum report according to the proper format CORRECTLY = 85–100;
2. Students perform measurement techniques INCORRECTLY, conduct analysis CORRECTLY, and prepare the practicum report according to the proper format CORRECTLY = 70–85;
3. Students perform measurement techniques CORRECTLY, conduct analysis INCORRECTLY, and prepare the practicum report according to the proper format CORRECTLY = 70–85;
4. Students perform measurement techniques CORRECTLY, conduct analysis CORRECTLY, and prepare the practicum report according to the proper format INCORRECTLY = 70–85;
5. Students perform measurement techniques INCORRECTLY, conduct analysis INCORRECTLY, and prepare the practicum report according to the proper format CORRECTLY = 50–70;
6. Students perform measurement techniques INCORRECTLY, conduct analysis CORRECTLY, and prepare the practicum report according to the proper format INCORRECTLY = 50–70;
7. Students perform measurement techniques CORRECTLY, conduct analysis INCORRECTLY, and prepare the practicum report according to the proper format INCORRECTLY = 50–70;
8. Students perform measurement techniques INCORRECTLY, conduct analysis INCORRECTLY, and prepare the practicum report according to the proper format INCORRECTLY = 30–50;
9. Students attend the field practicum but DO NOT submit the report = 0–30; 10. Students DO NOT attend the field practicum = 0

IMPLEMENTATION SCHEDULE

Note: The total number of days in one semester is $16 \times 7 = 112$ days. The schedule can be determined based on the day count.

Activity	Implementation Time
Field Practicum	100

OTHERS

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REFERENCES LIST

1. Ahrens, C. Donald. 2003, Meteorology Today, An Introduction To Weather, Climate, and The Environment, Seventh Edition, Thomson, Brooks/Cole, Australia.
2. Barry, Roger G, and Chorley, Richard J. 2003. Atmosphere, Weather, and Climate. New York: Routledge
3. Critchfield, Howard J., (1979). General Climatology. Prentice Hall India
4. Dengel, G.O.F., (1956). Dasar-Dasar Ilmu Cuaca, J.B. Wolters Jakarta, 1956 Doorenbos, J., and W.O. Pruitt, 1977. Guidelines for Predicting Crop Water Requirements. Food and Agriculture Organization of United Nations, Rome Fontanel dan Chantefort, 1978. Bioclimat du Monde Indonesian (Bioclimate of Indonesian Archipelago). Ha161-78
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