



UNIVERSITAS PENDIDIKAN INDONESIA

SEMESTER LEARNING PLAN (RPS)

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Course Identity

Course Name	Course Code	Credits	Workload	Course Group	Semester	Prerequisite	Published
Soil Geography and Land Resources	SA226	4	180	Study Programme Competency Development (PKPS)	3	-	2025-09-11 21:59:33

Prepared by Lecturer	Reviewed by QA Team	Approved by Head of Programme
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Course Description and Graduate Learning Outcomes (CPL)

Course Description	Soil Geography and Land Resources is a study programme competency development course.
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Graduate Learning Outcomes (CPL) Assigned to the Course		
1	To be able to master theoretical concepts of geography, geospatial technology applications for solving geosphere problems, and to develop models and methods for resolving geosphere problems.	
2	To be able to integrate learning and innovation skills, mastery of technology and information, career development, and life skills in order to become lifelong learners.	
3	To be able to design, develop, produce, utilise, control, and evaluate models of analysis and spatial	

	information theories based on science and technology.
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Course Learning Outcomes (CPMK)		
1	S7: To be law-abiding and disciplined in social and national life.	
2	P1: To be able to master theoretical concepts of geography, geospatial technology applications for solving geosphere problems, and to develop models and methods for resolving geosphere problems.	
3	KU6: To be able to maintain and develop collaborative networks with supervisors, colleagues, and peers both within and outside the institution.	
4	KK1: To be able to design, develop, produce, utilise, control, and evaluate models of analysis and spatial information theories based on science and technology.	

Sub-Course Learning Outcomes		
1	CPMK-1: To explain the scope and role of soil geography.	
2	CPMK-1: To describe the factors of soil formation and the concept of the soil body.	
3	CPMK-2: To analyse the physical, chemical, and biological properties of soil.	
4	CPMK-2: To explain the soil classification system and to determine soil names in accordance with the soil taxonomy system.	
5	CPMK-3: To explain the concept of land evaluation.	
6	CPMK-3: To master land survey techniques (instruments, procedures, and methods).	
7	CPMK-4: To apply land evaluation methods (land capability and land suitability).	
8	CPMK-4: To apply soil and land mapping.	
9	CPMK-4: To conduct field surveys in order to observe, measure, and collect soil and land data.	

Course Material		
1	Introduction to Soil Geography: scope, concepts, theories, and the position of soil in geographical inquiry	
2	Soil-forming factors and concepts of pedon, polydon, horizon, and soil profile	
3	Physical properties of soil: texture, structure, porosity, permeability, bulk density, colour	
4	Chemical properties of soil: pH, CEC, base saturation, and nutrients	
5	Biological properties of soil: soil organisms, microbes, and their role in decomposition	
6	Soil classification and soil taxonomy using the USDA system	
7	Soil classification and soil taxonomy using the FAO system	
8	Concept of land resources, land evaluation, and land survey	
9	Land survey techniques (instruments, procedures, and methods)	
10	Land capability evaluation: USDA land capability classification (I–VIII), limiting factors	
11	Land suitability evaluation: actual and potential suitability, FAO and national criteria	
12	Soil mapping: interpretation and compilation of soil maps	
13	Land mapping: survey- and GIS-based mapping of land use and land cover	
14	Field Survey Activities: observation, measurement, and collection of soil and land data	

Learning Outcomes at End of Course	1. Soil analysis report; 2. Land capability and suitability maps produced using GIS software; 3. Field study report on soil conditions and land resources, including potential and problems of land use; 4. Recommendations for sustainable land resource management strategies.
Learning Strategy	Case Method

Learning Steps	The learning process for Soil Geography and Land Resources is carried out through interactive lectures, discussions, and literature review to understand the basic concepts of soil and its relationship to land resources. Students then conduct laboratory practicals and mapping to analyse the physical-chemical properties of soil and land capability with the aid of GIS software. Field studies are conducted to identify soil profiles, land conditions, potential, and actual problems encountered in land use. Furthermore, students are trained to conduct land evaluation and to design sustainable land resource management strategies.
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Semester Learning Plan

Week	Sub-CPMK	Sub-CPMK Achievement Indicators	Course Material	Assessment Form	Weight (%)	Learning Form and Method
1	To explain the scope and role of soil geography	1. Students are able to explain the scope and position of soil geography in geographical inquiry. 2. Students are able to describe the basic concept of soil as an object of geographical study.	Introduction to Soil Geography: scope, concepts, theories, and the position of soil in geographical inquiry	Essay	5	Face-to-face lecture with expository method and question-and-answer; Assignment
2	To describe the factors of soil formation and the concept of the soil body	1. Students are able to describe the factors of soil formation. 2. Students are able to explain the concepts of pedon, polydon, horizon, and soil profile.	Soil-forming factors and concepts of pedon, polydon, horizon, and soil profile	Short answer	5	Face-to-face lecture with expository method and question-and-answer; Assignment
3	To analyse the physical, chemical, and biological properties of soil	Students are able to analyse the physical properties of soil.	Physical properties of soil: texture, structure, porosity, permeability, bulk density, colour	Participatory	5	Face-to-face lecture with expository method and question-and-answer; Assignment

4	To analyse the physical, chemical, and biological properties of soil	1. Students are able to explain the chemical properties of soil (pH, CEC, base saturation, and nutrients). 2. Students are able to assess the role of chemical properties in soil fertility.	Chemical properties of soil: pH, CEC, base saturation, and nutrients	Multiple choice	5	Face-to-face lecture with expository method and question-and-answer; Assignment
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Student Study Time (Workload)

Activity	Synchronous	Asynchronous	Student Preparation	Total
Lectures/Tutorials	14 × 120 min = 1,680 min	14 × 90 min = 1,260 min	14 × 30 min = 420 min	3,360 min (56.0 hrs)
Project-based Learning	4 × 120 min = 480 min	4 × 120 min = 480 min	4 × 60 min = 240 min	1,200 min (20.0 hrs)
Discussion (Case-based Learning)	8 × 60 min = 480 min	8 × 60 min = 480 min	8 × 30 min = 240 min	1,200 min (20.0 hrs)
Total Learning				5,760 min (96.0 hrs)
Participation During Learning	14 × 60 min = 840 min	14 × 30 min = 420 min	14 × 30 min = 420 min	1,680 min (28.0 hrs)
Project Work	8 × 60 min = 480 min	8 × 90 min = 720 min	8 × 30 min = 240 min	1,440 min (24.0 hrs)
Assignments	8 × 60 min = 480 min	8 × 60 min = 480 min	8 × 30 min = 240 min	1,200 min (20.0 hrs)
Quizzes	4 × 30 min = 120 min	4 × 30 min = 120 min	4 × 30 min = 120 min	360 min (6.0 hrs)
Formative				180 min (3.0 hrs)
Summative				180 min (3.0 hrs)
Total Workload				10,800 min (180 hrs)
Ideal Hours				180 hrs
Credits (SKS)				4

Compliance with Credit Hours				Compliant
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CPMK Assessment Criteria

No.	CPMK	Taxonomy Level	Weight	CPMK Achievement Criteria
1	S7: To be law-abiding and disciplined in social and national life.	2	10	75% of all students obtain a score of at least 65 (on a scale of 100)
2	P1: To be able to master theoretical concepts of geography, geospatial technology applications for solving geosphere problems, and to develop models and methods for resolving geosphere problems.	2	10	75% of all students obtain a score of at least 65 (on a scale of 100)
3	KU6: To be able to maintain and develop collaborative networks with supervisors, colleagues, and peers both within and outside the institution.	3	0	75% of all students obtain a score of at least 65 (on a scale of 100)
4	KK1: To be able to design, develop, produce, utilise, control, and evaluate models of analysis and spatial information theories based on science and technology.	4	0	75% of all students obtain a score of at least 65 (on a scale of 100)

Collaborative Assignment Design

Assignment Title	Field Activity: Soil and Land Resources Survey (Observation, Measurement, Mapping, Evaluation, and Analysis)
Learning Method	Case Method
Assessment Weight	50
Sub-CPMK	To conduct field surveys in order to observe, measure, and collect soil and land data.

Assignment Description

During the Soil and Land Resources Survey (Observation, Measurement, Mapping, Evaluation, and Analysis), students carry out field practice to study the relationship between soil characteristics and land use. With regard to soil, students observe soil profiles and horizons, measure physical, chemical, and biological soil properties, and determine the classification or naming of soil according to a taxonomy system. With regard to land, students observe land use and land cover, map actual field conditions, and evaluate the potential and limitations of the land with reference

to land capability and suitability concepts. The survey data are subsequently processed using a Geographic Information System (GIS) to produce soil and land maps combined with evaluative analysis. The final outputs of the activity consist of a written report, a soil description table, and interpretive GIS-based maps that emphasise the relationship between soil, land resources, and the direction of their sustainable utilisation.

Steps for Completing the Assignment

1. Preparation: Determine the location of soil observation points and land transects. Prepare field data including imagery and a tentative map. Prepare survey instruments (hoe/soil auger, ring sampler, GPS, pH meter, sample bags, camera, and data recording sheets).
2. Soil Observation in the Field: Excavate the soil profile at the designated point. Identify soil horizons (depth, colour, texture, structure). Conduct direct measurements: soil pH, moisture, simple permeability, and bulk density. Collect soil samples for laboratory analysis (optional, as required). Record data systematically on the survey form.
3. Land Observation in the Field: Observe land use and land cover conditions around the observation point. Record vegetation types, land use patterns (agriculture, settlements, etc.), and topographic conditions. Identify land limiting factors (slope, drainage, erosion, surface rocks, etc.). Document land conditions through field photographs.
4. Mapping with GIS: Enter observation points and survey results into GIS software (e.g., ArcGIS or QGIS). Compile a soil map (distribution of soil types, main properties). Compile a land use and land cover map. Integrate soil and land data to produce a land capability and suitability evaluation map.
5. Analysis and Evaluation: Classify soils according to the taxonomy system (USDA/FAO). Analyse actual and potential land suitability. Relate soil properties to land use and its limitations.

Outputs Produced	Report, map album, and presentation of results.
Assessment Indicators, Criteria, and Weights	Attendance; Accuracy of field observations; Report results.

References

References	
1	Sartohadi, J., Suratman, Jamulya, Dewi, N.I.S. (2012). Pengantar geografi tanah. Pustaka Belajar.
2	Foth, H. D. (1991). Fundamentals of soil science (No. Ed. 8, pp. xv+-360).
3	Davidson, D. A. (1992). The evaluation of land resources (pp. 198-pp).
4	McKenzie, N. (2008). Guidelines for surveying soil and land resources (Vol. 2). CSIRO publishing.

5	El Baroudy, A. A. (2016). Mapping and evaluating land suitability using a GIS-based model. <i>Catena</i> , 140, 96–104.
6	Montgomery, B., Dragicevic, S., Dujmovic, J., & Schmidt, M. (2016). A GIS-based Logic Scoring of Preference method for evaluation of land capability and suitability for agriculture. <i>Computers and Electronics in Agriculture</i> , 124, 340–353.
7	Singh, S. (2012). Land suitability evaluation and land use planning using remote sensing data and geographic information system techniques. <i>Int. J. Geology, Earth. Environ. Sci</i> , 2(1), 1–6.