

### 18. Module Handbook of soil geography

Module designation	The Soil Geography course is an elective course of interest offered in semester 2 in the Master of Geography study program. This course explains about soil resources in the context of the study of geography, soil formation and development, physical, chemical, biological, and mineralogy properties of soil and soil classification systems - soil mapping, and interpretation of soil resource development.							
Semester(s) in which the module is taught	Even							
Person responsible for the module	Dr. Eng. Guruh Samodra, S.Si., M.Sc. Dr.rer.nat Muhammad Anggri Setiawan, M.Si Prof. Dr. Junun Sartohadi, M.Sc.							
Language	Indonesian							
Relation to curriculum	Elective							
Teaching methods	SCL: <i>Team-based Project/Case-based Learning/PBL</i>							
Workload (incl. contact hours, self-study hours)	CLO1	Interactive discussions in class	3 meetings 6 x 50 minutes of classroom lectures and discussions					
	CLO2	Interactive discussions in class and assignments	2 meetings 4 x 50 minutes of classroom lectures and discussions 2 x 60 minutes of self-paced tasks					
	CLO3	Interaction discussions in class and assignments	2 meetings 4 x 50 minutes of classroom lectures and discussions 2 x 60 minutes of self-paced tasks					
	CLO4	Interaction discussions in class and assignments	3 meetings 6 x 50 minutes of classroom lectures and discussions 2 x 60 minutes of independent assignment (literature study and evaluation of literature study results in writing)					
	CLO5	Interaction discussions in class and assignments	4 meetings 8 x 50 minutes of classroom lectures and discussions 3 x 60 minutes of self-assignment (case study and evaluation of results in writing and presentation)					
Credit points	Assessment Techniques	Percentage of Assessment (%)	Criteria/ Indicators	CLO (%)				
				1	2	3	4	5
	Participatory Activities	10	Contribution of class discussion activities in each subject matter of the lecture		10			10
	<i>Project Results/ Case Study Results/ PBL Results</i>	50	Natural Resource Problem Analysis Economic review Case study and PBL assessment rubric		10		40	50
	Cognitive							

	Assignment	20	Task command conformance and task results Task rubric		10		10	20
	Final Exam	20	Answer key Final Exam assessment rubric		10		10	20
	Total	100						
Required and recommended prerequisites for joining the module	Taken after taking compulsory courses and adapted to the theme of the thesis							
Module objectives/intended learning outcomes	<b>ELO A1</b>	Understand the material and formal objects of geography in order to solve problems resulting from the imbalance of interaction between geographical components.						
	<b>CLO1</b>	Know and understand the pattern of soil distribution and soil formation. [CPL A1]						
	<b>CLO2</b>	Know and understand the physical, chemical, biological, and mineralogy properties of soil. [CPL A1]						
	<b>CLO3</b>	Understand and be able to apply soil mapping techniques for various purposes [CPL A1]						
	<b>CLO4</b>	Understand and be able to formulate land resource development plans [CPL A1]						
Content	<b>CLO1</b>	<ol style="list-style-type: none"> <li>1. A variety of soil parent materials and their distribution</li> <li>2. The process of soil development</li> </ol>						
	<b>CLO2</b>	<ol style="list-style-type: none"> <li>1. The relationship between the process of soil development with the physical, chemical, biological, mineralogy properties of the soil</li> <li>2. The relationship between the development process and the distribution pattern of land units</li> </ol>						
	<b>CLO3</b>	<ol style="list-style-type: none"> <li>1. Soil mapping methods scale review</li> <li>2. Semi-detailed soil mapping method</li> <li>3. Detailed scale soil mapping methods</li> </ol>						
	<b>CLO4</b>	<ol style="list-style-type: none"> <li>1. Utilization of land unit information for regional development planning and disaster risk reduction</li> <li>2. Cases of mining land rehabilitation/pasut area reclamation/agricultural land development</li> </ol>						
Examination forms	Final Exam							
Study and Examination Requirements	The examination is carried out offline and the questions are made in the form of a case study and covers CLO1, CLO2 and CLO3; The assessment based on results Participatory Activities 10%, Project result 50%, Assignment 20%, Summative Test (Mid-term and Final Exam) 20%.							
Reading list	<b>Main:</b> <ol style="list-style-type: none"> <li>1. Buol, S.W., Southard, R.J., Graham, R.C., and McDaniel, P.A. 2003. Soil Genesis and Classification. Fifth edition. Iowa State Press.</li> <li>2. Foth, H.D. 1990. Fundamentals of soil science. 8th ed. John Wiley S. Son.</li> </ol>							

	<ol style="list-style-type: none"> <li>3. Van Breemen N., and Buurman, P. 2003. Soil Formation. Second Edition. Kluwer Academic Publisher. New York.</li> <li>4. USDA. 2022. Keys to Soil Taxonomy - Thirteenth Edition. NRCS-USDA</li> <li>5. Soil Survey Staff, 2017. Soil Survey Manual. United States Department of Agriculture Handbook No. 18</li> <li>6. McKenzie, N.J., M.J. Grundy, R. Webster. And A.J. Ringrose-Voas, 2008. Guidelines for Surveying Soil and Land Resources. Second Edition. Australian Soil and Land Survey Handbook Series. CSIRO</li> <li>7. FAO, 2015. World reference base for soil resources 2014: International soil classification system for naming soils and creating legends for soil maps. Food and Agriculture Organization of The United Nations. Rome, 2015</li> <li>8. Blum, W.E.H., P. Schad and S Nortcliff, 2018. Essentials of Soil Science: Soil formation, functions, use and classification (World Reference Base, WRB). Borntraeger Science Publishers</li> <li>9. Boettinger, J.L., D.W. Howell, A.C. Moore, A.E. Hartemink and S. Kienast-Brown (Eds.), 2010. Digital Soil Mapping: Bridging Research, Environmental Application, and Operation. Springer.</li> <li>10. FAO, 2020. Framework for integrated land use planning: An innovative approach. Food and Agriculture Organization of The United Nation – Rome</li> </ol>
	<p><b>Additional:</b></p> <p>-</p>