

**DETERMINATION OF CREDITS COURSES  
INTRODUCTION OF SOIL SCIENCE**

Course	CLO	CLO 1.1	Learning method	Study Material	Study Hours		SKS/Credits
					T	P	
Basic of Soil Sciences	Students are able to explain the concept of soil formation and its components.	Able to define and explain the meaning, components and functions of soil as the basis of soil science	Face to Face, Structure Assignment, Independent Study	Soil Concept	4	0	
		Able to explain the processes and factors of soil formation	Face to Face, Structure Assignment, Independent Study, practicum	Process and the factors of soil formation	7	0	
	Able to explain the processes and factors of soil formation	Able to determine soil components based on soil physical properties	Face to Face, Structure Assignment, Independent Study, Practicum	1. Soil Physical Properties 2. Soil texture 3. Soil structure 4. Relationship between soil mass and volume (BJ, BI, porosity) 5. Soil consistency 6. Air 7. Temperature 8. Soil color 9. Groundwater	7	6	
		Able to determine the mineral components of clay	Face to Face, Structure Assignment, Independent Study, Practicum	Clay Minerals Understanding, Role, Load source, Types and characteristics	4	3	

		Able to determine soil components based on their chemical properties	Face to Face, Structure Assignment, Independent Study, Practicum	Soil Chemical Properties:1. Chemical elements that makeup soils 2. Periodic system of earth elements3. Chemical bond4. Valence5. Electromagnetic 6. Land CEC7. Soil pH8. Soil EC9. Alkaline soil and acid soil10. Soil buffer11. Liming	7	8
		Able to determine soil components based on soil biological properties	Face to Face, Structure Assignment, Independent Study	Biological Properties of Soil: 1. Classification of living bodies 2. The role of living bodies 3. OM sources 4. Process and results of weathering 5. The role and factors of soil OM 6. C/N Ratio	7	
		Able to explain soil and water conservation strategies	Face to Face, Structure Assignment, Independent Study	Soil and Water Conservation: 1. Understanding 2. Conservation 3. Biological conservation 4. Chemical Conservation 5. Physical conservation	4	
		Able to explain land and environmental problems as well as strategies for solving the problems	Face to Face, Structure Assignment, Independent Study	1. Identify environmental problems 2. The role of soil science 3. Diagnose and treat environmental problems	4	

Students are able to recognize and determine the physical and chemical properties of Soil	Able to determine soil components based on soil physical properties	Face to Face, Structure Assignment, Independent Study, Practicum	Soil Physical Properties:1. Soil texture2. Soil structure3. Relationship between soil mass and volume (BJ, BI, porosity)4. Soil consistency5. Air6. Temperature7. Soil color8. Groundwater	7	10
	Able to determine the mineral components of clay	Face to Face, Structure Assignment, Independent Study, Practicum	Clay Minerals 1. Understanding 2. Role 3. Load source 4. Types and characteristics	4	3
	Able to determine soil components based on their chemical properties	Face to Face, Structure Assignment, Independent Study, Practicum	Soil Chemical Properties 1. Chemical elements that make up soils 2.Periodic system of earth elements 3. Chemical bond 4. Valence 5. Electromagnetis 6.Land CEC 7. Soil pH 8.Soil EC 9. Alkaline soil and acid soil, 10. Soil buffer 11. Liming	7	8
	Able to determine and explain plant nutritional components, as well as fertilizer and fertilization	Face to Face, Structure Assignment, Independent Study	The nutritional components of plants and Types of fertilizer and how to fertilize	4	

		Able to explain soil and water conservation strategies	Face to Face, Structure Assignment, Independent Study	Soil and Water Conservation1. Understanding 2. Conservation3. Biological conservation4. Chemical ConservationPhysical conservation	4		
		Able to explain land and environmental problems as well as strategies for solving the problems	Face to Face, Structure Assignment, Independent Study	1. Identify environmental problems 2. The role of soil science 3. Diagnose and treat environmental problems	4		
	Students are able to explain the concepts of plant nutrition and plant fertilization.	Able to determine and explain plant nutritional components, as well as fertilizer and fertilization	Face to Face, Structure Assignment, Independent Study	The nutritional components of plants and Types of fertilizer and how to fertilize	4	0	
	Students are able to explain land and environmental problems	Students are able to know and explain land surveying and evaluation	Face to Face, Structure Assignment, Independent Study	Land surveys and evaluations	4	0	
		Able to explain soil and water conservation strategies	Face to Face, Structure Assignment, Independent Study	Soil and Water Conservation 1. Understanding 2. Conservation 3. Biological conservation 4. Chemical Conservation 5. Physical conservation	4	0	
		Able to explain land and environmental problems as well as strategies for solving the problems	Face to Face, Structure Assignment, Independent Study	Soil Science and Environmental Management 1. Identify environmental problems 2. The role of soil science 3. Diagnose and treat environmental problems	4		
				<b>Total Hours</b>	<b>90</b>	<b>38</b>	3
		sks/credit Theory	(Total Hours for Theory × 1 sks)/(2.83 × 16)	<b>SKS Theory</b>		~	2
		sks/credit Practicum/field work	(Total Hours for Practicum × 1 sks)/(2.83 × 10)	<b>SKS Practicum</b>		~	1

Notes: T = Theory P = Practicum/Field Work

1 SKS/Credit = 170 minutes = 2,83 hours

1 Semester = 16 Face Times

The study time required for students to achieve CLO at each learning stage is determined by the lecturer/lecturer team based on their experience in teaching the course.

Total Course SKS/Credits = Theory + Practicum/field work