



**SRIWIJAYA UNIVERSITY
FACULTY OF AGRICULTURE
LAND DEPARTMENT
SOIL SCIENCE STUDY PROGRAM**

SEMESTER LEARNING PLAN

A. COURSE IDENTITY

Subject	: FERTILIZER AND FERTILIZER TECHNOLOGY	Code: PTN 36215	Semester : 3/4	Credits : 3 (2-1)
Study material	:			
Course description	: This course will provide students with knowledge and skills related to plant nutrients and fertilizers, the properties and types of fertilizers, fertilizer manufacture and their reactions in the soil, the basics of fertilization, calculation of fertilizer needs, fertilization efficiency, preparation of fertilizer recommendations and future fertilization challenges. The implementation of learning is based on a lesson plan (RPS) which is equipped with theoretical learning materials and practical guides so that the learning implementation of the Fertilizer and Fertilizer Technology course is effective and efficient. The learning model consists of lectures and discussions, problem-based learning with student-centered groups. The assessment component consists of process assessment, namely intrapersonal skills (creative thinking, critical thinking,			
CPL	<ol style="list-style-type: none"> 1. Able to make appropriate decisions in the context of solving problems in their area of expertise, based on the results of information and data analysis (KU-5). 2. Able to be responsible for achieving group work results and supervising and evaluating the completion of work assigned to workers under their responsibility; (KU-7). 3. Able to document, store, secure, and retrieve data to ensure validity and prevent plagiarism (KU-9). 4. Mastering knowledge about the quality and use of land and land in a sustainable manner (P-3). 			

	5. Able to identify various soil and land problems in agricultural cultivation and apply the principles of Soil Science in various conditions (KK-2). 6. Able to classify soils, evaluate land suitability classes and choose alternative sustainable uses, so as to maintain soil ecological functions based on field observations, laboratory and landscape analysis and cartographic mapping (KK-3). 7. Able to carry out land surveys and mapping to evaluate land capability and suitability as the basis for sustainable land use planning (KK-4).	
Supporting lecturer	:	Responsible Lecturer : Prof. Dr. Ir. Nuni Gofar, MS

CPMK-1: Able to identify various types and quality of fertilizers and their effects on soil and plants (KK-2).

CPMK-2: Able to be responsible for the achievement of group work results in supervising and evaluating various types of fertilizer applications and their fate in the soil (KU-7)

CPMK-3: Mastering fertilizer and fertilization technology by paying attention to soil properties and plant types (P-3)

CPMK-4: Able to make the right decisions in solving future fertilization challenges based on the results of the analysis of information and data obtained in the field (KU-5).

B. LEARNING PROGRAM

Week	CPMK	Final Skills expected at each stage of learning (Sub-CPMK)	Subject	Learning method and time	Description of independent tasks and time	Indicator	Weight (%)	Reference
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)	(10)
1	CPMK-1: Able to identify various types and quality of fertilizers and their effects on soil and plants (KK-2).	Sub-CPMK-1: Understand the objectives and outputs of Soil Biology learning	Description of the objectives, content, instructors, regulations and competencies of the Fertilizer and Fertilizer Technology course and its implementation in the field of Agriculture	TM Lecture (2x50")	Students seek information from various sources (especially the Internet) about the meaning of fertilizers and fertilization philosophy and the role of fertilizers in agriculture (3x60")	Students understand the meaning, philosophy, history, and role of fertilization in intensive agriculture	5	Handouts, 1
2		Sub CPMK-1: Understand about natural and artificial fertilizers, organic and inorganic, single and compound, solid and liquid, biological fertilizers.	FERTILIZER CLASSIFICATION	Lecture TM (2x50"). Fertilizer introduction practicum (2x60")	Studying material uploaded at elearning.unsri.ac.id , reading reference books and enriching knowledge by searching related libraries via the internet [3 x 60']	Accuracy and appropriateness in explaining: 1. Natural fertilizers and artificial fertilizers 2. Organic fertilizer and inorganic fertilizer 3. Single and compound fertilizer 4. Solid and liquid fertilizer 5. Organic fertiliser	5	Handout, 2
3	CPMK-2: Able to be responsible for the	Sub CPMK-2: able to explain about the nature	NATURE AND CHARACTERISTICS OF	Lecture TM (2x50").	Studying the material uploaded	Accuracy and suitability in explaining the nature and	7.5	Handout, 2.3

Week	CPMK	Final Skills expected at each stage of learning (Sub-CPMK)	Subject	Learning method and time	Description of independent tasks and time	Indicator	Weight (%)	Reference
	achievement of group work results in supervising and evaluating various types of fertilizer application types of fertilizers and their fate in the soil (KU-7)	and characteristics of artificial fertilizers and the manufacturing process	ARTIFICIAL FERTILIZER AND THE PROCESS OF PRODUCTION	Practicum recognizes the nature and characteristics of artificial fertilizers (2x60'') and the manufacture of mixed fertilizers (2x60'')	at elearning.unsri.ac.id, searching for and summarizing readings about the nature and characteristics of artificial fertilizers and the manufacturing process [3 x 60']	characteristics of artificial fertilizers and the manufacturing process (N, P, K, Compound, Mg and S fertilizers, fertilizers containing micro elements, nano fertilizers).		
4		Sub CPMK-2: able to explain the nature and characteristics of organic fertilizers (manure, green manure, compost, biological fertilizer)	NATURE AND CHARACTERISTICS OF ORGANIC FERTILIZER	TM Lecture (2x50'') Practicum to know the nature and characteristics of organic fertilizer (2x60'')	Studying materials uploaded at elearning.unsri.ac.id, reading reference books and enriching knowledge about the nature and characteristics of organic fertilizers by searching related libraries via the internet [3 x 60']	Accuracy and suitability in explaining the nature and characteristics of manure, green manure, compost, and biological fertilizers and their manufacturing technology	7.5	Handout, 2.3
5		Sub CPMK-2: able to explain the management of fertilization (soil	FERTILIZING PROCEDURE	Lecture TM (2x50''). Practical	Studying the material uploaded at	Accuracy and suitability in explaining fertilization management (soil	7.5	Handout, 2.3

Week	CPMK	Final Skills expected at each stage of learning (Sub-CPMK)	Subject	Learning method and time	Description of independent tasks and time	Indicator	Weight (%)	Reference
		application, leaves, irrigation water, air)		practice of fertilization in the field (6x60")	elearning.unsri.ac.id, reading reference books and enriching knowledge by searching libraries related to fertilization management via the internet [3 x 60']	application, leaves, irrigation water, air)		
6		Sub CPMK-2: able to explain about the factors that affect fertilization, such as the nature and characteristics of the soil, climate, types of plants, and cropping patterns.	FACTORS AFFECTING FERTILIZATION	TM Lecture (2x50")	Studying material uploaded at elearning.unsri.ac.id, reading reference books and enriching knowledge by searching related libraries via the internet [3 x 60']	Accuracy and suitability explain the factors that affect fertilization, such as soil properties and characteristics, climate, plant species, and cropping patterns.	7.5	Handout, 2.3
7		Sub CPMK-2: able to calculate fertilizer requirements for monoculture and intercropping of food crops and plantation crops.	CALCULATE THE NEED FOR FERTILIZER	Lecture TM (2x50"). Practical for calculating fertilizer needs (5x60")	Studying materials uploaded at elearning.unsri.ac.id, reading reference books and enriching knowledge by	The accuracy and suitability of the calculation of fertilizer requirements for monoculture cultivation and intercropping of food crops as well as on plantation crops.	7.5	Handout, 2.3

Week	CPMK	Final Skills expected at each stage of learning (Sub-CPMK)	Subject	Learning method and time	Description of independent tasks and time	Indicator	Weight (%)	Reference
					searching libraries related to calculating fertilizer needs via the internet [2 x 60']			
8	Mid-Semester Evaluation: validate learning outcomes, evaluate and improve the next learning process							
9	CPMK-3: Mastering fertilizer and fertilization technology by paying attention to soil properties and plant types (P-3)	Sub CPMK-3: Mastering the steps in formulating fertilizer recommendations based on experiments, soil and plant analysis, and how to calculate fertilizer needs	STEPS TO COMPLETE FERTILIZER RECOMMENDATIONS	Lecture TM (2x50"). Experimental Fertilizer Practicum (6x60")	Studying material uploaded at elearning.unsri.ac.id, reading reference books and enriching knowledge by searching related libraries via the internet [2 x 60']	Students understand the steps in preparing fertilizer recommendations	7.5	Handout, 2.3
10		Sub CPMK-3: Master how the fate of fertilizers in the soil and what are the basic considerations for applying fertilizers.	FATE OF FERTILIZER IN SOIL AND BASIS OF CONSIDERATION OF FERTILIZING	TM Lecture (2x50")	Doing group assignments, discussing in discussion forums according to topics prepared by the supporting lecturer [2x 60']	Students understand how the fate of fertilizers in the soil and what are the basic considerations for applying fertilizers.	7.5	Handout, 2.3
11		Sub CPMK-3:	FERTILIZER QUALITY CONTROL	TM Lecture (2x50")	Doing group assignments,	Students' ability to explain the importance of	7.5	Handouts

Week	CPMK	Final Skills expected at each stage of learning (Sub-CPMK)	Subject	Learning method and time	Description of independent tasks and time	Indicator	Weight (%)	Reference
		Dominatethe importance of controlling the quality of fertilizers, methods of controlling the quality of fertilizers, regulations for controlling the quality of fertilizers.			discussing in discussion forums according to topics prepared by the supporting lecturer [2x 2 x 60']	controlling the quality of fertilizers, methods of controlling the quality of fertilizers, regulations for controlling the quality of fertilizers.		
12	CPMK-4: Able to make the right decisions in solving future fertilization challenges based on the results of the analysis of information and data obtained in the field (KU-5).	Sub CPMK-4: Able to complete the challenge of fertilization on annual crops	THE EFFECT OF FERTILIZER ON THE PRODUCT OF ANIMAL PLANT	Lecture TM (2x50"). Practicum visiting farmers (4x60")	Doing group assignments, discussing in discussion forums according to topics prepared by the supporting lecturer [2 x 60']	Students' ability to explain the effect of various types of fertilizers on crop yields from various articles read.	7.5	Handouts, 2
13		Sub CPMK-4: Mastering the challenges of fertilization on plantation crops (especially oil palm and rubber)	FERTILIZER AND FERTILIZATION TECHNOLOGY IN PLANTATION CROPS	TM Lecture (2x50")	Doing group assignments, discussing in discussion forums according to topics prepared by the supporting lecturer [3 x 60']	Ability to analyze future fertilizer challenges in plantation crop cultivation	7.5	Handouts, 2
14		Sub CPMK-4: to provide solutions to future fertilization challenges, such as cultivation on poor soils, intensification	FUTURE FERTILIZING CHALLENGES	TM Lecture (2x50")	Doing group assignments, discussing in discussion forums according to topics	Ability to analyze challenges and provide future fertilization solutions, such as cultivation on poor soils, intensification	7.5	Handouts, 1,2,3

Week	CPMK	Final Skills expected at each stage of learning (Sub-CPMK)	Subject	Learning method and time	Description of independent tasks and time	Indicator	Weight (%)	Reference
		programs, unsustainable use of fertilizer raw materials, increasingly expensive fertilizer prices			prepared by the supporting lecturer [4 x 60']	programs, use of unsustainable fertilizer raw materials, increasingly expensive fertilizer prices		
15		Sub CPMK-4: Mastering the positive and negative effects of fertilization on the environment	THE EFFECT OF FERTILIZATION ON ENVIRONMENTAL POLLUTION	TM Lecture (2x50")	Doing group assignments, discussing in discussion forums according to topics prepared by the supporting lecturer [3 x 60']	Be able to explain the forms of groundwater pollution by fertilizers	7.5	Handouts, 1,2,3
16	End of Semester Evaluation: validate the final assessment results and determine student graduation.							

Workload: TM lectures 1200 minutes, practicum 720 minutes, group discussion 740 minutes, independent assignments 1860 minutes, exam 180 minutes = 4700 minutes = 78.33 hours = 3.13 ECTS

Reference:

1. Gofar, N. 2015. Fertilizer and Fertilizer Technology in Suboptimal Land. Polimedia Publishing, Jakarta.
2. Havlin, JL, Tisdale, SL, Nelson, WL, Beaton. JD 2013. Soil Fertility and Fertilizers: an introduction to nutrient management (6th Ed). Macmillan Publishing Company. New York, NY.
3. Jones, JB 2012. Plant Nutrition and Soil Fertility Manual. 2nd Ed. CRC Press.