



Module Description/Course Syllabi

Study Programme : Magister of soil science

Faculty of Agriculture.

Universitas Andalas

1.Course number and name

MIT 81103 ADVANCED SOIL FERTILITY

2.Credits and contact hours/Number of ECTS credits allocated

3 sks (2-1)

3.Instructors and course coordinator

1. Dr. Ir. Teguh Budi Prasetyo, MS; 2. Prof. Dr. Ir. Herviyanti, MS; 3.Dr. Ir. Gusnidar,MP

4.Text book, title, outhor, and year

1. Tisdale & Nelson. 1985. Soil Fertility & Fertilizers
2. Yusuf Nyakfa et al. 1986. Soil Fertility
3. L'Annunziata. 1980. Nuclide Tracer
4. Munir, M. 1995. Indonesia's main lands .
5. Noor, M. 1996. Marginal Land Rice .
6. Center for Soil and Agroclimate Research, 2000. Indonesia's Land Resources and Their Management.
7. Hardjowigeno, S and Rayes, L. 2001. Paddy Fields.
8. Tan, K.H. 2003. Humic Matter in Soil and the Environment.
9. Setyorini, D, Adiningsih, J. S., and Rochayati, S. 2003. Soil use as a constituent basis for fertilization recommendations.

<p>10. Noor, M. 2004. Marshlands, Properties and Management of acidic sulphate problem soils.</p> <p>11. ----- . 2008. Soils in the Humid Tropics and Monsoon Region of Indonesia. 12. Sufardi. 2019. Introduction to plant nutrition. Second print</p> <p>13. Publications in research journals related to Subject Matter/Sub-Topic</p>
<p>5. Specific course information</p>
<p>A. Brief description of the content of the course (catalog description)</p>
<p>This course covers the importance of soil fertility, factors affecting soil fertility; plant growth, especially genetic and environmental factors; nutrient uptake mechanisms mainly factors affecting plant growth, soil colloids and the process of nutrient movement to roots and then plant bodies; problems, availability, role, and fertilization of nitrogen; phosphorus problems, availability, role, and fertilization of nitrogen; problems, availability, role, and fertilization of potassium, calcium, magnesium; Problems, availability, role, and fertilization of sulfur and microelements; acid soil and liming; Management of organic matter sources; paddy fields; marginal land, use of radioisotope techniques in evaluating soil fertility; and Evaluation of Soil Fertility.</p>
<p>B. Course Content</p>
<p>Week Course Content</p> <p>1 Introduction: the importance of soil fertility, factors affecting soil fertility 2 Factors affecting plant growth: Genetic and environment factors</p> <p>3 Mechanism of and factors affecting plant nutrient absorption: soil colloids, process of nutrient movement to plant roots</p> <p>4. Nitrogen (N) nutrient: Problems and availability in soils, the role of N within plants, N fertilization</p> <p>5 Phosphorus (P) nutrient: Problems and availability in soils, the role of P within plants, P fertilization</p> <p>6 K, Ca, Mg nutrients: Problems and availability in soils, the role of K, Ca, Mg within plants, the fertilization</p> <p>7 Sulfur (S) and micro nutrients: Problems and availability in soils, the role of S & micronutrients within plants, the fertilization</p> <p>8 Mid term Exam</p>

<p>9 Acid soil and integrated liming: problem of acid soils, objectives of liming, materials and need of lime, factors considered for and calculation of lime dosage, effect of lime on soil and plant</p> <p>10 Organic matter management for soil fertility: the source, the compound, the nature and properties, degradation(weathering) process, role of OM, cultivation and utilization of tithonia (a type of green manure)</p> <p>11 Fertilizer use efficiency (FUE) : Role of Radioisotope techniques, Calculation of FUE: conventional, isotop techniques</p> <p>12-13 Marginal land management: acid soils, Ultisols & Oxisols, Efforts to improve Acid sulfate and peat soil management: the problems, and efforts to improve</p> <p>14 Rice field management: The chemical properties, types of rice fields (conventional, no tillage, SRI, Legowo)</p> <p>15 Soil fertility evaluation: soil testing, plant testing, biological testing, fertilizer recommendation</p> <p>16 Final Exam</p>
<p><i>C. Semester when the course unit is delivered</i></p>
<p>Even Semester</p>
<p><i>D. Mode of delivery (face-to-face, distance learning)</i></p>
<p>Face to face</p>
<p><i>E. Intended Learning Outcomes (CPL)</i></p>
<p>ILO 1 : An ability to analyze and interpretate nature and characteristics of many soilsin determining the potency and the threat of the land and environmentresources</p> <p>PI 3 : An ability to interpretate soil data</p> <p>ILO 2 : An ability to classify soil, to evaluate land capability and suitability, as well asto determine the alternative utilization for sustainable agriculture andenvironment</p>

PI 2 : An ability to evaluate soil capability

ILO 3 : An ability to use technology in identifying and solving problems of soil, land resource, environment problems independently, eligibly, and accurately

PI 2 : An ability to work independently in determining soil properties

7. Course Learning Outcomes (CPMK) ex. The student will be able to explain the significance of current research about a particular topic.

1. Students will be able to interpret data of many soils

2. Students will be able to use soil data to evaluate soil capability and land suitability

3. Students will be able to analyze soil independently either at laboratory or at field site

8. Learning and teaching methods

Cooperative Learning and Problem Base Learning

9. Language of instruction

Indonesian and English (English Class)

10. Assessment methods and criteria

Summative Assessment :

1. Task + Quiz : 10%
2. Mid Semester : 20%
3. Final Semester : 20%
4. Practicum : 30 %

Formative Assessment:

1. Thumb up and thumb down
2. Minutes paper

