Course Module

Soil Fertility and Fertilization

Faculty of Forestry

Mulawarman University

Module name	Soil Fertility and Fertilization
Modul level, if applicable	Graduates Programme
Code, if applicable	220401803P027
Subtitle, if applicable	
Courses, if applicable	Regular
Semester(s) in wich the module is taught	III (three)
Person responsible for the module	Dr. Ir. Wahjuni Hartati, M.P.
Lecturer	Dr. Ir. Wahjuni Hartati, M.P. Dr. Ir. Syahrinudin, M.Sc. Dr. Ir. Ibrahim, M.P., Prof. Dr. Ir. Marjenah, M.P.
Language	Indonesia
Relation to curriculum	Programme, mandatory
Type of teaching, contact hours	Lecture, 4 lecture contact hours
Workload	Number of meetings per semester: 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination) 3 x 50 minutes lectures, 3 x 60 minutes structure activity, 3 x 60 minutes individual activity, with a total of 7,140 minutes or equivalent to a total of 119 hours in 14 weeks per semester
Credit points	3 SKS (4.8 ECTS) Details: 1 Credit = 170 min/week 1 Credit = 170 min x 14 week = 2,380 min/semester 1 ECTS = 25 h / semester 1 Credit = 2,380 / 60 / 25 = 1.59 = 1.6 ECTS 3 Credit = 1.6 x 3 = 4.8 ECTS
Requirements according to the examination regulations	Have attended not less than 80% class meetings
Recommended prerequisites	
Module objectives/intended learning outcomes	**Intended Learning Outcomes** **Knowledge and Understanding** **ILO-1 :** Applying scientific ethics, norms, and values of professionalism

	Investigation **ILO-3 :** Able to analyze current problems and issues, and assess the ecological, social, and economic impacts of implementing programs in the forestry and tropical environmental sectors. **Engineering Design and Practice** **ILO-4 :** Develop research schemes based on inter or multidisciplinary approaches to tropical forestry and the environment, and communicate the results to the public. **Social Competences** **ILO-5 :** Lead, work in a team, and be responsible for achieving group work results. **Course Learning Outcomes** **Knowledge and Understanding** **CLO-1 :** Able to recognize the function of soil as a medium for growing plants and the urgency of managing soil fertility, as well as providing alternative solutions to improve soil fertility that are oriented towards production and economy independently and responsibly. **Investigation** **CLO-2 :** Able to identify the function of soil as a medium for growing plants and the urgency of managing soil fertility, as well as providing alternative solutions to increase soil fertility that are oriented towards production and economy independently and responsibly.
Content	This course begins with the delivery of the RPS, the function of soil as a medium for plant growth, the definition of soil fertility and the urgency of soil fertility management, factors that affect nutrient availability; Mechanisms of nutrient absorption and transport; Sources, functions, symptoms of Nitrogen, Phosphorus, Potassium, Calcium, Magnesium and Sulfur deficiencies, micro nutrients; The role of organic matter in soil fertility; Able to explain the role of soil acidity in affecting soil fertility; Able to evaluate and improve soil fertility. After attending this course, students have the ability to: 1. Able to explain the function of soil as a medium for plant growth, the definition of soil fertility and the urgency of managing forest soil fertility. **(CLO-1)** 2. Able to detail and explain the factors that affect nutrient availability. **(CLO-1)** 3. Able to explain the mechanism of nutrient uptake and transport. **(CLO-1)** 4. Able to mention and describe the sources, functions, symptoms of Nitrogen deficiency. **(CLO-1)** 5. Able to mention and describe the sources, functions, symptoms of Phosphorus deficiency. **(CLO-1)**

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6. Able to mention and describe the sources, functions, symptoms of Potassium deficiency. (CLO-1)
7. Able to mention and describe sources, functions, symptoms of Calcium, Magnesium and Sulfur deficiency (CLO-1)
8. Students are able to identify insects that have the potential to be domesticated and cultivated. (CLO-2)
9. Able to mention and describe the sources, functions, symptoms of micronutrient deficiencies (CLO-1)
10. Able to evaluate and improve soil fertility (CLO-2)
11. Able to describe the meaning, classification of fertilizers (CLO-1)
12. Able to explain the objectives, basics of fertilization actions and be able to determine fertilizer needs (CLO-1)
13. Able to explain the role of soil acidity in affecting soil fertility and calculate the need for lime (CLO-1)
14. Able to evaluate and improve soil fertility (CLO-2)
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<tr><td>Study and examination requirements and forms of examination</td><td>
Evaluation and assessment of the learning process are following scheme 5 in the Academic Regulations of Mulawarman University:
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<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Laboratory Practice/Fieldwork</td><td>Participation, Group Project Report</td><td>20</td></tr>
<tr><td>3</td><td>Assignment/Case study</td><td>Group presentation</td><td>15</td></tr>
<tr><td>4</td><td>Project</td><td>Report</td><td>15</td></tr>
<tr><td>5</td><td>Mid-semester test</td><td>Written test</td><td>15</td></tr>
<tr><td>6</td><td>Final semester test</td><td>Written test</td><td>25</td></tr>
<tr><td colspan="3">TOTAL</td><td>100</td></tr>
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<tr><td>Media employed</td><td>Laptop, LCD</td></tr>
<tr><td>Reading list</td><td>

1. Harjowigeno, S.1993.Ilmu Tanah.Edisi Revisi. PT Mediya Tama Sarana Perkasa, Jakarta. 233 h.
2. Noor,M. 2004. Lahan Rawa, Sifat dan Pengelolaan Tanah Bermasalah. PT Raja Grafindo Persada, Jakarta. 235
3. Sanchez, P.A. 1993. Sifat dan Pengelooan Tanah Tropika. Jilid 2. ITB, Bandung. 303 h.
4. Subroto.1996. Tanah, Pemanfaatan dan Dampaknya. Faperta UNMUL, Samarinda. 127 h.
5. Priadjati,W.L. 1979. Dipterocarpaceae: Forest Fires and Forest Recovery Series IX, TI,Wegeningen. 214 h.
6. Rayes, M.L. 2007. Metode Inventarisir Sumber Daya Lahan. ANDI, Yogyakarta. 293 h
7. Kartasapoetra, A.G. 1989. Kerusakan Tanah Pertanian dan Usaha Untuk Merahabilitasinya. Bina Aksara, Jakarta. 235 h.
8. Foth, H.D. Dasar Dasar Ilmu Tanah. Edisi VII. GajahMada Press, Yogyakarta. 781 h.
9. Poerwowidodo, 1990. Gatra Tanah Dalam Pembanguan HTI. Rajawali Press, Jakarta. 235 h.

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	10. Lahjie, A.M. 2001. Teknik Agroforestri. UPN Neteran, Jakarta. 284 h.