



Course Module

Forest Protection in Tropical Rainforest

Faculty of Forestry

Mulawarman University

Module name	Forest Protection in Tropical Rainforest
Modul level, if applicable	Graduates Programme
Code, if applicable	190401802P020
Subtitle, if applicable	
Courses, if applicable	Regular
Semester(s) in which the module is taught	II (two)
Person responsible for the module	Dr.rer.nat. Harmonis, S.Hut., M.Sc.
Lecturer	Dr.rer.nat. Harmonis, S.Hut., M.Sc., Dr. Ir. Djumali Mardji, M.Agr
Language	Indonesia
Relation to curriculum	Programme, mandatory
Type of teaching, contact hours	Lecture, 3 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) 2 x 50 minutes lectures, 2 x 60 minutes structured assignment, 2 x 60 minutes individual activity, with a total time of 4760 minutes or equivalent to a total of 79.3 hours in 14 weeks per semester
Credit points	2 SKS (3.2 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 2 Credit = 1.6 x 2 = 3.2 ECTS
Requirements according to the examination regulations	Have attended not less than 80% class meetings
Recommended prerequisites	
Module objectives/intended learning outcomes	<u>Intended Learning Outcomes</u> <u>Engineering Analysis</u> ILO-2 : Mastering specialized knowledge, skills and techniques in the field of forestry and tropical environment and being able to develop innovative theories, models and methods in their field.

	<p><u>Investigation</u></p> <p>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.</p> <p><u>Engineering Design and Practice</u></p> <p>ILO-4 : Develop research schemes based on inter or multidisciplinary approaches to tropical forestry and the environment, and communicate the results to the public.</p> <p><u>Social Competences</u></p> <p>ILO-5 : Lead, work in a team, and be responsible for achieving group work results.</p> <p><u>Course Learning Outcomes</u></p> <p><u>Engineering Analysis</u></p> <p>CLO-1 : Students are able to apply the theory obtained from the Forest Protection Science (Perlantan) lesson in detecting and identifying forest-damaging factors and applying methods for preventing and eradicating forest-damaging factors.</p> <p><u>Investigation</u></p> <p>CLO-2 : Students are able to master, analyze and solve various problems in relation to forest-damaging factors to immediately take preventive and eradicating steps</p> <p><u>Engineering Design and Practice</u></p> <p>CLO-3 : Students are able to make strategic decisions based on analysis of information and data in the field using the Perlantan Science approach and methods and provide recommendations to related parties</p> <p><u>Social Competences</u></p> <p>CLO-4 : Students are able to have commitment, dedication, consistency, integrity, responsibility in carrying out tasks, both individually and in groups, and are able to simplify problems of motivation, knowledge, skills and attitudes related to the field of Perlantan Science.</p>
Content	<p>This course covers the concept of forest protection science, the areas covered include methods for preventing and eradicating forest diseases, controlling forest pests and controlling forest fires.</p> <p>After attending this course, students have the ability to:</p> <ol style="list-style-type: none"> 1. explain the scope of the Forest Protection field and be able to analyze the characteristics of forests that are vulnerable and resistant to disturbances (CLO-1) 2. explain forest protection problems in the tropics, subtropics, temperate and be able to analyze the differences in these characteristics (CLO-1)

3. explain the types and characteristics of humid tropical forest diseases, and be able to analyze the factors that influence their development **(CLO-1)**
4. explain forest disease prevention methods, and be able to analyze the use of appropriate method types **(CLO-2)**
5. explain forest disease eradication methods, and be able to analyze the use of appropriate method types **(CLO-2)**
6. explain the dynamics of forest pest populations, and be able to analyze the use of appropriate method types and analysis **(CLO-2)**
7. explain forest pest control systems, and be able to analyze the use of appropriate method types **(CLO-2)**
8. explain types of forest pests and their control systems, and be able to analyze the success and weaknesses of the control system being implemented **(CLO-2)**
9. explain fire ecology, and be able to analyze the factors that influence forest fires **(CLO-3)**
10. explain the impact of forest fires, and be able to analyze the impact of each type of forest fire **(CLO-3)**
11. explain forest fire prevention and eradication, and be able to analyze preventive measures and appropriate eradication **(CLO-4)**
12. explains post-forest fire handling, and is able to analyze appropriate handling actions **(CLO-4)**

Study and examination requirements and forms of examination

Evaluation and assessment of the learning process are following scheme 5 in the Academic Regulations of Mulawarman University:

No.	Objects of Assessment	Forms of Assessment	Quantity (%)
1	Affective	Participation	10
2	Assignment/Case study	Group presentation	25
3	Project	Presentation	25
4	Mid-semester test	Written test	15
5	Final semester test	Written test	25
TOTAL			100

Media employed Class, MS. Powerpoint, Ms. Word, Laptop, LCD

Reading list

1. Old, K.M., See, L.S., Sharma, J.K. and Yuan, Z.Q. 2000. A Manual of Tropical Acacias in Australia, South-East Asia and India. Center for International Forestry Research, Bogor. 104 h.
2. Pscheidt, J.W. 2009. Plant Disease Control. Rose Powdery Mildew. http://plantdisease.ipcc.orst.edu/plant_images/RosePowderyMildewConidia39-021.jpg.

3. Rismansyah, E.A. 2010. Bakteri Entomopatogenik. <http://erlanardianarismansyah.wordpress.com/2010/01/02/bakteri-entomopatogenik/>
4. Suratmo, F.G. 1979. Diktat Perlindungan Hutan. Bagian Perlindungan Hutan. Fkultas Kehutanan Institut Pertanian Bogor, Bogor
5. Syaufina, L. 2014. Kebakaran Hutan dan Lahan di Indonesia. Bayumedia Publishing, Malang.
6. Tacconi, L. 2003. Kebakaran Hutan di Indonesia: Penyebab, Biaya dan Implikasi Kebijakan. Center for International Forestry Research (Cifor), Bogor.
7. Thomas, P.A. and McAlpine, R.S. 2010. Fire in the Forest. Cambridge University Press, Cambridge, United Kingdom.
8. Tylka, G. 2009. Quick Acts About Corn Nematodes. <http://www.extension.iastate.edu/NR/rdonlyres/0A35F431-F7F7-4C10-80DC-2B9B0F0E45A9/100540/lesionnematodesinsidecornroottissue.jpg> rsz0428
9. Varmah, J.C. 1981. Sandal (*Santalum album*) Spike Disease. Dalam: Mycoplasma Diseases of Trees and Shrubs (Maramorosch, K. and S.P. Raychaudhuri, eds.), h 253-258. Academic Press, New York.
- Fric, F. 1976. Oxidative Enzymes. Dalam: "Phytopathogenic Prokaryotes" (Mount, M.S. and G.H. Lacy, eds.), h 617-631. Vol. 2. Academic Press, New York.
10. Goldammer, J.G. 1990. Fire in the Tropical Biota. Ecosystem Processes and Global Challenges. Springer, Berlin, Heidelberg.
11. Gouli, V. 2006. Mycoses of Invertebrates. Predatory Fungi Connected with Nematodes and Other Groups of Invertebrates. http://www.gouli.110mb.com/my_work.html.
12. Hadi, S. 2001. Patologi Hutan. Perkembangannya di Indonesia. Fakultas Kehutanan Institut Pertanian Bogor. 516 h.
13. Horsfall, J.G. and Cowling, E.B. 1977. Plant Disease. Vol 1-3. Academic Press, New York.
14. Lilly, V.G. and H.L. Barnett. 1951. Physiology of the Fungi. McGraw-Hill Book Company, Inc., New York. 464 h.
15. Manion, P.D. 1981. Tree Disease Concepts. Prentice-Hall, Inc., Englewood Cliffs, New York. 399 h.