Course Module



Biodeterioration ang Building Protection

Faculty of Forestry

Mulawarman University

Module name	Biodeterioration ang Building Protection				
Modul level, if applicable	Doctoral				
Code, if applicable	190401903P022				
Subtitle, if applicable					
Courses, if applicable	Regular				
Semester(s) in wich the module is taught	The course is available in all active teaching semesters				
Person resposible for the module	Dr. Ir. Isna Yuniar Wardhani, M.P.				
Lecturer	Dr. Isna Yuniar Wardhani, M.P. Dr. Erwin, S.Hut., M.P.				
Language	Indonesia, English				
Relation to curriculum	Compulsory				
Type of teaching, contact hours	Direct instruction, discussion, and assignment				
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid-semester, 1 meeting for final examination) For this course, students are required to meet a minimum of 119 hours per semester, which consist of: - 35 hours for lecture - 42 hours for structured assignments - 42 hours for individual study				
Credit points	3 SKS / 4.8 ECTS Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2380 min / semester 1 Credit = 39.7 h / semester 1 ECTS = 25 h / Semester 1 Credit = 1.59 » 1.6 3 Credit = 1.6 x 3 = 4.8 ECTS				
Requirements according to the examination regulations					
Recommended prerequisites					

Intended Learning Outcome (ILO) Attitude 1. CPL1/ILO1 (S1) - Internalize values, norms, and ethics Knowledge 2. CPL2/ILO2 (P1) - Synthesize knowledge acquired from research findings with novelty and its implementation General Skills 3. CPL4/ILO4 (KU1) - Critically analyze the philosophy, theory, and research methodology in forestry and the moist tropical environment sciences through interdisciplinary, multidisciplinary, and transdisciplinary approaches 4. CPL5/ILO5 (KU2) - Demonstrate academic leadership in resource management to independently formulate research plans and possess scientific ethics Course Learning Outcome (CLO) 1. CLO 1: Students are able to explain the basic concepts, philosophy, and general approaches to biodeterioration and building protection. 2. CLO 2: Students are able to analyze the relationship between construction design and biodeterioration and develop effective control strategies. 3. CLO 3: Students are able to formulate and explain the management of wooden building protection against biological, chemical, and physical factors causing biodeterioration of buildings, focusing specifically on biodeterioration factors affecting construction materials. It begins by examining the philosophical and practical aspects of building protection, progressing to analyze how design choices influence material deterioration. Detailed discussions include management strategies against biological, chemical, and physical deteriorations, particularly in wooden structures, with sessions dedicated to understanding the specific deterioration processes caused by fungi, bacteria, termites, and wood-boring beetles. The course emphasizes the detection, analysis, and economic implications of deteriorated wood, alongside exploring biological control methods. A midterm and final exam ensure that students have a comprehensive understanding of the material. The complete topic of each meeting is mentioned below: 1. Introduction of the Lecturer Course, Delivery of the Course Plan		Intended Learning Outcome (ILO)				
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Module objectives/intended learning outcomes 3. CPL4/ILO4 (KU1) - Critically analyze the philosophy, theory, and research methodology in forestry and the moist tropical environment sciences through interdisciplinary, multidisciplinary, and transdisciplinary approaches 4. CPL5/ILO5 (KU2) - Demonstrate academic leadership in resource management to independently formulate research plans and possess scientific ethics Course Learning Outcome (CLO) 1. CLO 1: Students are able to explain the basic concepts, philosophy, and general approaches to biodeterioration and building protection. 2. CLO 2: Students are able to analyze the relationship between construction design and biodeterioration and develop effective control strategies. 3. CLO 3: Students are able to formulate and explain the management of wooden building protection against biological, chemical, and physical factors causing biodeterioration. This course delves into the deterioration and protection of buildings, focusing specifically on biodeterioration factors affecting construction materials. It begins by examining the philosophical and practical aspects of building protection, progressing to analyze how design choices influence material deterioration. Detailed discussions include management strategies against biological, chemical, and physical deteriorations, particularly in wooden structures, with sessions dedicated to understanding the specific deterioration processes caused by fungi, bacteria, termites, and wood-boring beetles. The course emphasizes the detection, analysis, and economic implications of deteriorated wood, alongside exploring biological control methods. A midterm and final exam ensure that students have a comprehensive understanding of the material. The complete topic of each meeting is mentioned below: 1. Introducing Vision and Mission of the Lecture Contract,		2. CPL2/ILO2 (P1) - Synthesize knowledge acquired from research				
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$(1^{st} session) \rightarrow General Orientation$	Content	focusing specifically on biodeterioration factors affecting construction materials. It begins by examining the philosophical and practical aspects of building protection, progressing to analyze how design choices influence material deterioration. Detailed discussions include management strategies against biological, chemical, and physical deteriorations, particularly in wooden structures, with sessions dedicated to understanding the specific deterioration processes caused by fungi, bacteria, termites, and wood-boring beetles. The course emphasizes the detection, analysis, and economic implications of deteriorated wood, alongside exploring biological control methods. A midterm and final exam ensure that students have a comprehensive understanding of the material. The complete topic of each meeting is mentioned below: 1. Introducing Vision and Mission of the Lecture Contract, Introduction of the Lecturer Course, Delivery of the Course Plan				

	 Explain the relationship between design/construction and the biodeterioration of building materials (4th-5th sessions) → CLO2. Identify and explain the management of wooden building protection against biological, chemical, and physical factors (6th-7th sessions) → CLO3 Midterm Exam (8th session) → Assessment Understand and comprehend the characteristics and processes of wood deterioration, enabling them to differentiate the specific characteristics caused by each microbial agent (fungi and bacteria) (9th-10th sessions) → CLO3. Understand and comprehend the characteristics and processes of wood deterioration, enabling them to differentiate the specific characteristics caused by termites (11th session) → CLO3. Understand and comprehend the relationships and interactions among causative agents of wood deterioration and techniques for detecting and analyzing deteriorated wood and its economic impact (12th session) → CLO3. Understand and comprehend important considerations in biological control methods for wood deterioration (13th session) → CLO3. Understand and comprehend the characteristics, forms, and processes of wood deterioration caused by wood-boring beetle attacks (14th-15th session) → CLO3. Final Exam (16th session) → Assessment Evaluation and assessment of learning achievement based on: 					
	No	Objects of Assessment	Forms of Assessment	Quantity (%)		
	1	Affective	Participation	10		
Study and examination requirements and forms of examination	2	Practicum	Participation, Group Project Report	20		
	3	Assignment/Case Study	Group Presentation	15		
	4	Project	Report	15		
	5	Mid-semester test	Written test	15		
	6	Final semester test	Written test	25		
		TOTA	AL .	100		
Media employed	Class, Ms. Powerpoint, Ms. Word, Computer, LCD, STAR					
Reading list	 Anonim. 1985. Standard for The Assurance of Quality of Batch Drying of Timber. Timber Research and Development Association. Buckinghamshire. Anonim. 1994. EDG-Recommendation. Assesement of Drying Quality of Timber. Editor: Dr. J. Welling. Commission of The European Communities. Hamburg. Boone, R.S; C.J. Kozlik; P.J. Bois and E.M. Wengert. 1988. Dry Kiln Skedul for Commercial Woods. Temperate and Tropical. 					

- General Technical Report FPL-GTR-57. Forest Products Laboratory. Forest Service. Department of Agriculture. United States.
- 4. C. Clausen, F. Green. 1998. Immunodiagnostic Wood Decay Test. USDA Forest Service. Madison.
- 5. Campbell NA, JB Reece dan LG Mitchell. 2002. Biologi (Terjemahan). Edisi Kelima. Jilid I dan Jilid II
- 6. F.W.M.R. Schwarze, J. Engels, C. Mattheck. 2000. Fungal Strategies of Wood Decay in Trees. Springer-Verlag. Berlin.
- 7. Highley TL. 1999. Biodeterioration of Wood. Wood Handbook: Wood as an Engineering Material. USDA Forest Service. Madison.
- 8. Nandika D, Y Rismayadi dan F. Diba. 2003. Rayap: Biology dan Pengendaliannya. Universitas Muhammadiyah Surakarta. Surakarta.
- 9. O. Schmidt. 2006. Wood and Tree Fungi: Biology, Damage, Protection, and Use. Springer-Verlag. Berlin.
- 10. Pratt, G.H. 1986. Timber Drying Manual. Second Edition. Revised by C.H.C. Turner. Princes Risborough Laboratory. Building Research Establishment. Departement of the Environment. Buckinghamshire.
- 11. R.A. Eaton and M.D.C. Hale. 1993. Decay, pest and protection. Chapman & Hall. London.
- 12. Raven PH, RF Evert and SE Eichhorn. 1998. Biology of Plants. Sixth Edition.
- 13. Shigo L.A. 1989. A New Tree Biology: Facts, Photos, and Philosophies on Trees and Their Problems and Proper Care.
- 14. Spotts RA and M. Serdani. 2005. New High-Technology Methods to Solve Old Decay Problem.
- 15. Willeitner, H. & W. Liese. 1992. Wood Protection in Tropical Countries. GTZ GmbH.