



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	

Module objectives/intended learning outcomes	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.
Content	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, Introduction of the Lecturer Course, Delivery of the Course Plan (1st session) → General Orientation 2. Explain the philosophy, deterioration, and protection of buildings (2nd–3rd sessions) → CLO1.

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	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: Biologi 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.
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