**University Gadjah Mada**
*Faculty of Forestry*
*Study Program of Doctor in Forestry Science*
***Module Handbook***

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| **Name (Code)** | : Wood Adhesive Chemistry and Its Application (KTDT22807) |
| ECTS \| Type \| Status | : 7.5 \| Class lecture \| Elective |
| Semester \| OfL:OnL Ratio \| LMS | : 2 \| 60:40 \| elok.ugm.ac.id |
| Pre-Requisite | : - |
| Description of content | : This course raises the basics of developing forestry science through research, including scientific theory and its benefits for research, components and characteristics of theory, research propositions, basics of analysis in research, principles of measurement and experimental analysis. The discussion also raises cases of field and laboratory research on silvicultural aspects, tree breeding, environmental manipulation and integrated control of pests and diseases. |
| Course Outcomes and PLO mandated | : Finishing this course, student will be able to compare the basic principles of various types of wood adhesives and binders (CLO1/PLO3), compare and analyze the mechanism of the reaction of wood adhesives and binders (CLO2/PLO3), analyze the factors that influence the reaction mechanism of wood adhesive and binder (CLO3/PLO4), and formulate adhesive/binder applications on wood (CLO4/PLO7) |
| Lecturer(s) | 1. Prof. Dr. Ragil Widyorini<br>2. Prof. Dr. Ganis Lukmandaru |
| Workload | : Total workload per semester is for 14 weeks, with weekly activities: 2*(50' lectures,60' structured activities, 60' independent study), and 2 mid exam and final exam weeks. |
| Learning Method | : Class Lecture and Discussion |
| Student Learning Experience | : Actively discuss the class material and research cases, structured assignment, group work, quiz, material reflection, review of literature and solution for forestry sectors |

Mapping CO-syllabus

| CLO | Syllabus | Learning form | Meetings |
|---|---|---|---|
| 1 | 1. Basic principles of adhesive<br>2. Types and Characteristics of Adhesive Materials<br>3. Types and Characteristics of Wood Binders | Class lecture and discussion | 3 |
| 2 | 4. Adhesive Reaction Mechanisms<br>5. Cases of the gluing reaction mechanism of various types of adhesives<br>6. Mechanisms of Bonding Reaction<br>7. Cases of the gluing reaction mechanism of various types of binder | Class lecture, discussion, presentation | 4 |
| 3 | 8. Factors of adhesives/binders on reaction mechanisms and test analysis<br>9. Chemical bonding of adhesives and binders with wood<br>10. Process factors on the reaction mechanism and its test analysis<br>11. Analysis of the gluing reaction test with a chemical and thermal approach | Class lecture, discussion, assignment | 4 |
| 4 | 12. The principle of application of adhesives/binders to lignocellulosic materials<br>13. Effect of extractives on the reaction mechanism of adhesives and their applications<br>14. Effect of extractives on the reaction mechanism of binders and their applications | Class lecture, discussion, presentation | 3 |

Assessment method

| Base of Evaluation | Component of Evaluation | CLO1 | CLO2 | CLO3 | CLO4 | Total (%) |
|---|---|---|---|---|---|---|
| Participative activity | Assignment, quiz, presentation | √ | | √ | | 35 |
| Cognitive & Psychomotoric | Mid exam | √ | √ | | | 30 |
| Case Study result | Final exam/ presentation | | √ | √ | √ | 35 |

References


1. Rowell R (ed). 2005. Handbook of Wood Chemistry and Wood Composite. CRC Press. Florida.
2. Pizzi, A. 2019 (e-publication). Wood Adhesives: Chemistry and Technology. CRC Press. USA.
3. Mohanty AK, Misra M, Drzal LT. (eds). 2005. Natural Fibers, Biopolymers, and Biocomposites. CRC Press. USA.
4. Related journals