MULAWARMAN

Course Module

Advanced Forest Products Processing

Faculty of Forestry

Mulawarman University

Module name	Advanced Forest Products Processing			
Module level, if applicable	Graduates Programme			
Code, if applicable	190401802W007			
Subtitle, if applicable				
Courses, if applicable	Regular			
Semester(s) in which the module is taught	I (one)			
Person responsible for the module	Dr. Ir. Isna Yuniar Wardhani, M.P.			
Lecturer	Prof. Dr. Ir. Edy Budiarso Prof. Dr. Rudianto Amirta, S.Hut., M.P. Prof. Dr. Harlinda Kuspradini, S.Hut., M.P. Dr. Ir. Isna Yuniar Wardhani, M.P.			
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	Have attended not less than 80% class meetings			
examination regulations				
Module objectives/intended learning outcomes	Intended Learning Outcomes (ILO): Knowledge and Understanding ILO-1: Applying scientific ethics, norms, and values of professionalism Engineering Analysis 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. 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 Course Learning Outcomes (CLO):			
	Knowledge and Understanding			

	CLO-1: Students are able to organize forest products based on raw materials and manufacturing processes Engineering Analysis CLO-: Students are able to select various NTFP based on government policies Investigation CLO-3: Students are able to work together in abstracting various sources of information related to forest products This course provides an in-depth understanding of the latest techniques and technologies in forest product processing. The course covers various aspects of forest product processing, from raw materials to final						
Content	DI A 1. 2. 3. 4. 5. 6.	various aspects of forest product processing, from raw materials to final products, with a focus on sustainability and efficiency. After attending this course, students have the ability to: 1. Able to describe the basic processes in wood processing (drying and preservation) (CLO-1) 2. Able to organize various forest products based on raw materials and manufacturing processes (CLO-1) 3. Able to abstract information related to wood processing products (CLO-1) 4. Able to examine plant HHBK groups based on SNI (CLO-2) 5. Able to detect essential oil HHBK commodities in Indonesia (CLO-2) 6. Able to analyze raw materials, processes and products of renewable energy sources from plants (CLO-3) 7. Able to examine forms of renewable energy based on their benefits (CLO-3)					
Study and examination requirements and forms of examination		No.	Objects of Assessment	Forms of Assessment	Quantity (%)		
		1	Affective	Participation	10		
		2	Assignment/Case study	Group presentation	25		
		3	Project	Presentation	25		
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		4	Mid-semester test	Written test	15		
		5	Mid-semester test Final semester test	Written test Written test	15 25		
		5	Final semester test	Written test TOTAL	25		
Media employed		5 lass, N	Final semester test MS. Powerpoint, Ms. Wor	Written test TOTAL rd, Laptop, LCD	25		
Media employed Reading list	2. 3. 4. 5.	5 Shr Sci We Kol Wo Spr Dir A I Kol Sci Ber	AS. Powerpoint, Ms. Wormulsky, R and P.D. Jorence. An Introduction. st Sussex, UK. Ilmann F.F.P., E.W. Kue and Science and Technolinger-Verlag. Berlin New mitriou I dan Rutz D. 20 Handbook. WIP Renewallmann F.F.P. and W.A. ence and Technology.	Written test TOTAL rd, Laptop, LCD nes. 2019. Forest Prod 7th Edition. John Wild nzi & A.J. Stamm. 197 ology. Vol. I. Wood B	25 100 ucts and Wood ey & Sons Ltd, 5. Principles of ased Materials. otation Coppice: ermany, 1-109. ciples of Wood Springer-Verlag.		

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- 7. Louie H.. 2018. Off-Grid Electrical Systems in Developing Countries. Springer International Publishing, Switzerland. 1-477.
- 8. Sharma D dan Saini A. 2020. Lignocellulosic Ethanol Production from a Biorefinery Perspective: Sustainable Valorization of Waste. Springer
- Amirta R, Suwinarti W, Yuliansyah, Haqiqi MT, Susanto D, dan Wulandari R. 2021. Peran Strategis Sektor Kehutanan dalam Mewujudkan Kemandirian dan Kedaulatan Energi di Kalimantan Timur: Percepatan Penyediaan Listrik Desa di Wilayah Pedalaman (Remote Area), (Chapter). UNMUL Hebat, Kaltim Berdaulat, Kuat: Kontribusi Pemikiran Universitas Mulawarman di Usia 60 Tahun. IPB Press, 391-414.
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- 11. Amirta R, Angi EM, Yuliansyah, Ananto BR, Setiyono B. 2017. Desa Mandiri Listrik: Potensi Pengembangan Energi Listrik Berbasis Biomassa Hutan. Mulawarman University Press, 1-115
- 12. Amirta R, Haqiqi MT, Saparwadi, Septia E, Mujiasih D, Setiawan KA, Sekedang MA, Yuliansyah, Wijaya A, Setiyono B, Suwinarti W. 2019. Searching for potential wood biomass for green energy feedstock: A study in tropical swamp-peat forest of Kutai Kertanegara, Indonesia. Biodiversitas, 20 (6): 1516-1523.
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- 14. Amirta R, Nafitri SI, Wulandari R, Yuliansyah, Suwinarti W, Candra KP, Watanabe T. 2016. Comparative characterization of Macaranga species collected from secondary forests in East Kalimantan for biorefinery of unutilized fast growing wood. Biodiversitas, 17 (1): 116-123.
- 15. Amirta R, Yuliansyah, Angi EM, Ananto BR, Setiyono B, Haqiqi MT, Septiana HA, Lodong M, Oktavianto RN. 2016. Plant diversity and energy potency of community forest in East Kalimantan, Indonesia: Searching for fast growing wood species for energy production. Nusantara Bioscience, 8 (1): 22-31.
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- 19. McKendry P. 2002. Energy production from biomass (part 3): gasification technologies. Bioresour Technol 83 (1): 55-63