



University of Gadjah Mada

Faculty of Forestry

Study Program of Doctor in Forestry Science

Module Handbook

Name (Code)	: Forest Ecosystem Modeling (KTDM22805)							
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 emphasizes on understanding the concept of forest ecosystem systems and analysis, models, and modeling of forest ecosystems in the field of natural resource management, especially forests, landscapes and forest lands, wildlife, and social communities. This complex system analysis is focused on selected forest ecosystems to be formulated in a model concept.							
Course Outcomes and PLO mandated	Finishing this course, student will be able to formulate model concepts of selected Forest Ecosystems (CO1/PLO3), to differentiate system languages; STELLA and NetLogo for modeling (CO2/PLO4), and to formulate selected Forest Ecosystems using Agent/Individual Based Modeling (CO3/PLO7).							
Lecturer(s)	1. Dr. Ir. Ronggo Sadono 2. Dr. Muhammad Ali Imron							
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, structured assignment, group work, quiz, material reflection, review of literature and cases in forestry sectors							
Mapping CO-syllabus	CO	Syllabus	Learning form	Meeting s				
	1	1. The role of modeling in Indonesian forest ecosystem management 2. System concept & analysis of Indonesian forest ecosystems 3. The concept of models and modeling of Indonesian forest ecosystems 4. Agent/Individual Based Modeling (ABM): Principles and Theory 5. Modeling Cycle for ABM: Pattern oriented modeling 6. ABM/IBM communication: Overview, Design Concept, Detail (ODD) protocol 7. Testing and validation of ABM	Class lecture and discussion	7				
	2	8. Conceptual model and system language: STELLA 9. Quantitative specification and use of system language, STELLA 10. Model evaluation/validation and model use 11. Model formulation of selected Forest Ecosystems	Class lecture and discussion	4				
	3	12. Natural and social resource management modeling 13. Spatial modeling of forest land use and landscape 14. Complex systems analysis	Class lecture and discussion	3				
Assessment method	Base of Evaluation		Component of Evaluation		CO1	CO2	CO3	Total (%)
	Participative activity		Quiz and presentation		√			10
	Cognitive & Psychomotoric		Mid exam		√	√		40
	Case Study result		Final exam/ presentation		√		√	50
References	<ol style="list-style-type: none"> Grant, W.E., E.K. Pedersen & S.L. Marin. 1997. Ecology and Natural Resource Management. System Analysis and Simulation. John Wiley & Sons, Inc. USA Purnomo, H. 2012. Modeling and Simulation for Adaptive Management of Environmental and Natural Resources. Bogor, IPB Press. Ecological Modeling of Journal Elsevier Environmental Modelling & Software Forest Ecology and Management Journal Elsevier Individual-based modeling and ecology Landscape Modeling Natural Resource Modeling 							