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

Name (Code)	Ecosystem Restoration Silviculture (KTDS22807)			
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	ERS course introduces the process of restoring damaged forest ecosystems through a review of silvicultural theory as a basis for modeling ERS concepts and techniques as part of silvicultural interventions. The focus of the discussion is directed at how silvicultural techniques are developed for ecosystem restoration as a basis for consideration in modifying based on rationalization for projecting and developing ERS regimes. This course is sharpened by abstracting the ERS regime which is integrated with appropriate science and technology that is unique to its forest ecosystem mandate. The ERS lecture begins with an overview of silvicultural theory that underlies restoration techniques integrated with an understanding of the physical characteristics, biology of forest ecosystems and important to maintain and restore. Silvicultural treatments at the stand level and their effects on restoration parameters such as vegetation composition, stand structure, tree growth, animal populations are part of the subject matter for the rationalization of the basis for the ERS regime development. The influence of silvicultural treatments on forest health and mitigation due to climate change is also discussed in this course through regime projections that are integrated in biophysical engineering for productive ecosystem restoration.			
Course Outcomes and PLO mandated	Finishing this course, student will be able to review the silvicultural theory that underlies developing restoration techniques in ecosystems (CLO1/PLO3), to pattern silvicultural concepts and techniques for ecosystem restoration (CLO2/PLO3), to modify silvicultural techniques to provide unique solutions based on ecosystem restoration problems (CLO3/PLO4), to rationalize the basic considerations for compiling a silvicultural regime for productive ecosystem restoration (CLO4/PLO4), to project a silvicultural regime that combines biophysical engineering for productive ecosystem restoration (CLO5/PLO7), and to construct the silvicultural regime of ecosystem restoration that is integrated with typical science and technology in the formulation of appropriate technology CLO6/(PLO7)			
Lecturer(s)	1. Prof. Dr. Priyono Suryanto 2. Prof. Dr. Widiyatno 3. Dr. Ananto Triyogo 4. Prof. Dr. M.Sambas Sabarnurdin 5. Prof. Dr. Sumardi			
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 problem in forestry sectors			
Mapping CO-syllabus	CO	Syllabus	Learning form	Meetings
	1	1. Developments in the utilization of forest resources, the negative impacts (trade off) and the underlying importance of restoration. 2. Transformation of silvicultural theory: the basis for modeling ERS concepts and techniques as part of silvicultural interventions.	Class lecture, assignment	2
	2	3. Forest ecosystem-based silvicultural concept (close to nature silviculture review): constituent components, physical and biotic characteristics, interaction and balance between components. 4. Forest ecosystem damage: natural and anthropogenic damage and its effects on ecological, economic and cultural functions. 5. Review of agroforestry theory and practice: integrated restoration (ecology, economy and culture)	Class lecture, assignment	3
	3	6. Succession management: the concepts of succession for restoration and restoration for succession 7. Intensive silviculture: concept, application and role in tropical forest ecosystem restoration (ecophysiological perspective).	Class lecture, assignment	2
	4	8. Wanagama critical land rehabilitation: concept, application and role in restoration (ecological and social perspective) 9. Choice of silvicultural treatment and its impact on restoration parameters, forest health and climate change mitigation.	Class lecture, assignment	2
	5	10. Forest health monitoring and its relation to the process and	Class lecture,	2

		assessment of ecosystem damage forest. 11. ERS Diagnosis and Design: planning, implementing, and managing restoration systems and agroforestry as part of a wider effort to restore forested landscapes tropical.					assignment		
	6	12. Opportunity to develop forest restoration silviculture based on integrated forest farming systems (IFFS) 13. Opportunity to develop silvopasture-based restoration silviculture 14. Opportunities for the development of silvicultural restoration for area management					Class lecture, assignment		3
Assessment method	**Base of Evaluation**	**Component of Evaluation**	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**Total (%)**
	Participative activity	Assignment	√	√	√	√	√	√	50
	Cognitive & Psychomotoric	Mid exam	√	√	√	√			25
	Case Study Results	Final Exam					√	√	25
References	1. van Andeland J and Aronson J. 2006. Restoration Ecology The New Frontier. Blackwell Publishing. 2. Clewell AF and Aronson J. 2007. Ecological Restoration: Principles, Values, and Structure of an Emerging Profession. Island Press. 3. Falk DA, Palmer MA, and Zedler JB. 2006. Foundations of Restoration Ecology. Island Press. 4. Nyland RD. 2004. Silviculture, Concepts and Applications.TheMcGraw-Hill Companies, Inc. New York. 5. Paoletti MG. 2012. Invertebrate biodiversity as bioindicators of sustainable landscapes: Practical use of invertebrates to assess sustainable land use. Elsevier. 6. Sayer J and Maginnis S. 2005. Forest in Landscapes: Ecosystem approaches to sustainability. Earthscan. 7. Tallent-Halsell NG. 1994. Forest Health Monitoring: Fields methods guide (No. PB-95- 190419/XAB; EPA-620/R-94/027)								