Module/Course Description
Forest Harvesting (MNH 331)

A. Module Identity		
1.	Name	Forest Harvesting
2.	Code	MNH 331
3.	Credit	3 (2-3)
4.	Semester	5 (Odd)
5.	Pre-requisite	-
6.	Coordinator	Prof Dr Ir. Juang R.Matangaran, MS
7.	Lecturers	1. Prof. Dr Ir. Juang R.Matangaran, MS 2. Prof.Dr.Ir.Elias 3. Dr.Ir.Gunawan Santosa.,MS 4. Dr.Ir.Ahmad Budiaman, MSc 5. Dr.Ujang Suwarna SHut MSc 6. Dr.Efi Y Yovi, SHut. MSc.
8.	Language	Indonesian
9.	Program(s) in which the course is offered	Internal department: Forest Management Study Program Other departments: all study programs in IPB University as election course
10.	Type of teaching	a. Traditional classroom: 100 % b. Blended system: Traditional classroom….%, Online….% c. e-Learning system: ……..% d. Others: ……..%

B. Workload of course components (total contact hours and credits per semester)								
Credit		Contact Hours**				Self-Study	Other	Total
SKS *)	ECTS	Lecture	Class Exercise	Laboratory	Field Practice			
3		**28**	**42**			**56**		**126**

**) Semester credit unit according to the Indonesian higher educational system*
1 credit unit lecture = 2 hours/ week for lecture and 2 hours/ week for self-study within 14 weeks/ semester
1 credit unit class exercise or laboratory or field practice = 3 hours/week within 12-14 weeks/semester
***) 1 hour for lecture= 50 minutes; 1 hour for class exercise or laboratory or field practice = 60 minutes*

C. Module Objective (Learning Outcomes)

By the end of this course, the students are able to conceive, determine and make plan of the forest harvesting systems, phases and techniques of forest harvesting (from felling, bucking, skidding, loading, unloading, hauling, and rafting); to compute timber harvesting product, calculate volume and determine quality of timber, to realize the basic principles of forest cleaning, to devise forest harvesting planning; to conceive harvesting especially for teak forest; to fully clarify the equipment and machine harvesting, occupational health and safety, and technique to harvest non-timber forest product.

D. Detailed Course Learning Outcomes (LO) in Relation to Learning Domains, Teaching Strategies, and Assignment Methods			
No.	**LO in Learning Domains**	**Teaching Strategies**	**Assessment Methods**
a.	**Knowledge**		
1.	Students are able to explain the scopes of forest harvesting science, forest harvesting history and linkage between forest harvesting science and other forestry science.	• Presentation • Discussion dan debriefing (Q/A)	Mid-Test 1%
2.	Student are able to explain the stages of forest harvesting and derivative activity on each harvesting stages	• Presentation • Discussion dan debriefing (Q/A)	Mid-Test 4%
3.	Students are able to explain the harvesting system and consideration of harvesting system selection	• Presentation • Discussion dan debriefing (Q/A)	Task 5%
4.	Students are able to explain the felling/logging technique and dividing rod	• Presentation • Discussion dan debriefing (Q/A)	Mid-Test 5%
5.	Students are able to explain the timber skidding technique, consideration of several skidding techniques selection and determining Log Landing Site (TPn)	• Presentation • Discussion dan debriefing (Q/A)	Mid-Test 10%
6.	Students are able to explain the timber loading technique, timber hauling technique, and timber unloading technique	• Presentation • Discussion dan debriefing (Q/A)	Mid-Test
7.	Students are able to explain the basic principles of measurement and timber testing	• Presentation • Discussion dan debriefing (Q/A)	Mid-Test
8.	Students are able to clarify basic principles of worktime measurement based on work element	• Presentation • Discussion dan debriefing (Q/A)	Last Exam
9.	Student are able to explain principles of worktime measurement based on work element	• Presentation • Discussion dan debriefing (Q/A)	Last Exam
10.	Students are able to explain the basic of forest clearing (PWH).	• Presentation • Discussion dan debriefing (Q/A)	Last Exam
11.	Student are able to explain the basic principle and the process of teak forest harvesting and timber administrations	• Presentation • Discussion dan debriefing (Q/A)	Last Exam
12.	Student are able to explain harvesting of non-timber forest products	• Presentation • Discussion dan debriefing (Q/A)	Last Exam
13.	Student are able to explain the harvesting machine and equipment, occupational health and safety (K3)	• Presentation • Discussion dan debriefing(Q/A)	Last Exam
14.	Student are able to explain process and environmentally-friendly forest harvesting techniques	• Presentation • Discussion dan debriefing (Q/A)	Last Exam

b.	**Skills**		
1.	Students are able to measure and decide timber quality	• Presentation • Discussion • Practicum	Authentic assessment
2.	Student are able estimate and compute labor productivity each forest harvesting stage	• Presentation • Discussion • Practicum	Authentic assessment
3.	Student are able to explore the harvesting of non-timber forest products in Indonesia	• Presentation • Discussion • Practicum	Authentic assessment
4.	Student are able to explore process and environmentally-friendly forest harvesting techniques in Indonesia	• Presentation • Discussion • Practicum	Authentic assessment
c.	**Competences:**		
1.	Students demonstrate a willingness to participate in the class activities	• Lecturer's explanation • Discussion	Authentic assessment
2.	Students are able to complete all tasks and participate in class discussion	• Lecturer's explanation • Discussion • Homework/ Assignment	Authentic assessment

E. Module Content		
List of Topic	**Number of Weeks**	**Contact Hours**
• Explanation of rules and lecture courses agreement • Limitation of forest harvesting and development of forest harvesting history • Linkage betweenforest harvesting and other science	1	2
• The stages of harvesting planning • The stages of felling/logging and bucking policy • The stages of skidding and hauling	1	2
• Forest harvesting systems • Basic consideration of harvesting system selection	1	2
• Principle of area fall determination (tree felling) • Making notch fall and notch reply • Trunk division technique	1	2
• Consideration of skidding system selection • Wood skidding techniques • Log Landing Site (TPn), log concentration yard/ logpond (TPK)	1	2
• Modes of wood hauling • Timber loading technique • Rafting technique, dimensional raft and river requirement	1	2
• Basic principle and the purpose of timber measurement • Measurement of timberdimensions and timber spilasi • Identyfication timber defects and timber testing • Determination of timber quality	1	2
• Work element • Basic principles of worktime measurement • Classification of working time • Classification of work product measurement • Work productivity measurement	2	4

• Purpose forest clearing • Types and functions forest road • Trace and road density • Power capacity and quality road	1	2
• Characteristic of teak forest • Systems and organizational structure of the teak forest harvesting • Timber administrations	1	2
• Definition of non-timber forest products • Classification of non-timber forest products • Harvesting technique of non-timber forest products	1	2
• Power plant, power train dan attachment • The type,performance tool and felling machine, skidding machine, loading machine and wood unloading machine in the natural forest industrial forest • Calculation of capacity and the number of machines • The importance of work safety in timber harvesting • The rules of occupational health and safety management • Work accident management	1	2
• Forest harvesting of conventional techniques • Forest harvesting and reduce impact logging technique • Managing the impact of forest harvesting	1	2

F. Course Assessments

No.	Assessment Type *)	Schedule (Week Due)	Proportion of the Final Mark
1.	Mid-Term Examination	The 8th Week	35%
2.	Final Examination	The 16th Week	35%
3.	Exercise Report/ Homework	Minimal 3 times in a semester	30%

**) Example: mid-term examination, final examination, quiz, homework, project, etc.*

G. Media Employed

Laptop, LCD, Microphone, White Board, Marker, Pointer

H. Learning Resources

h1. Textbooks:

1. Brown A. 1969. *Logging*. New York (US): John Wiley and Sons.
2. Conway, S. 1982. *Logging Practices. Principles of Timber Harvesting Systems*. San Fransisco (US): Muller Freeman Publication Inc.
3. DepHut RI, 1998. *Sejarah Kehutanan Indonesia.* Jakarta (ID); Dephut.
4. Elias, Applegate G, Kartawinata K, Machfudh, Klassesn A. 2001. *Pedoman Reduced Impact Logging Indonesia*. Bogor: CIFOR, Dephut, ITTO
5. Soeparto RS. 1978. *Eksploitasi Hutan Modern*. Bogor (ID): Fakultas Kehutanan IPB.
6. United Tractor. 1984. *Manajemen Alat-Alat Besar (Teknik Dasar Pemilihan, Pemakaian dan Pengelolaan Alat-alat Besar).* Jakarta (ID): PT United Tractors.