

## Module/Course Description

### Forest Work Science (MNH 333)

A. Module Identity		
1.	Name	Forest Work Science
2.	Code	MNH 333
3.	Credit	3 (2-3)
4.	Semester	6 (Even)
5.	Pre-requisite	-
6.	Coordinator	Dr. Efi Y. Yovi
7.	Lecturers	1. Dr. Efi Y. Yovi 2. Dr. Ahmad Budiaman 3. Dr. Gunawan Santosa 4. Dr. Ujang Suwarna
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			
<b>3</b>		<b>28</b>	<b>42</b>			<b>56</b>		<b>126</b>

\*) 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)	
<p>Students are able to make rational strategies to improve efficiency in forestry operations (considering aspects: work productivity, occupational health and safety, and comfort/well-being) based on knowledge of Forest Work Science that consist of: basic human physiology (body organ systems, maximum work capacity, physical workload), work posture analysis (REBA, RULA, biomechanical analysis), occupational accidents, occupational health disorders, risk management, worker cognitive aspects, elements in risk perception (psychometrics paradigm), work measurement, and research method (time and motion study).</p>	

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
<b>a.</b>	<b>Knowledge</b>		
1.	Students are able to explain the definition, scope, history, and	Presentation and discussion	Authentic assessment of the completeness and correctness

	objectives of ergonomics, as well as various characteristics in forest utilization operations		in explanation, understanding, and analysis
2.	Students are able to explain that humans have a variety of abilities and limitations that affect various bodily organ systems (physiology) in various physical activities in various forest operations, including maximum work capacity, physical workload, fatigue, and rest.	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
3.	Students are able to analyze work postures quantitatively and qualitatively	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
4.	Students are able to explain various types of work accidents and health problems (analyzing).	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
5.	Students are able to explain and identify sources of danger, assess risk, and control hazards (applying).	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
6.	Students are able to explain the status of forestry workers in Indonesia in terms of cognitive ergonomics (analyzing).	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
7.	Students are able to assess the perceptions of risk possessed by workers (analyzing).	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
8.	Students are able to conduct research of time to determine work performance (evaluating).	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
9	Students are able to use knowledge related to Forestry Science to improve efficiency in forestry operations, especially forest products harvesting based on ergonomic principles that humans as the center of attention in human relations with their work activities, humans with their work environment, and humans with other humans.	Presentation and discussion	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
<b>b.</b>	<b>Skills</b>		
1.	Students are able to demonstrate and practice about the diversity of abilities and limitations that affect various bodily organ systems (physiology) in various physical activities in various forest utilization operations	Presentation and discussion, practical work, and independent/group assignments	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis

2.	Students are able to give examples of various types and types of work accidents and health problems	Presentation and discussion, practical work, and independent/group assignments	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
3.	Students are able to provide examples and case studies related to hazard sources, risk assessment, and hazard control in forestry activities	Presentation and discussion, practical work, and independent / group assignments	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
4.	Students are able to observe and describe the status of forestry workers in Indonesia in terms of cognitive ergonomics	Presentation and discussion, practical work, and independent / group assignments	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
5.	Students are able to demonstrate and practice for research in determining work performance	Presentation and discussion, practical work, and independent / group assignments	Authentic assessment of the completeness and correctness in explanation, understanding, and analysis
<b>c. Competences:</b>			
1.	Students demonstrate a willingness to participate in the class activities	<ul style="list-style-type: none"> <li>• Lecturer's explanation</li> <li>• Discussion</li> </ul>	Authentic assessment
2.	Students are able to complete all tasks and participate in class discussion	<ul style="list-style-type: none"> <li>• Lecturer's explanation</li> <li>• Discussion</li> <li>• Homework/Assignment</li> </ul>	Authentic assessment

<b>E. Module Content</b>		
<b>List of Topic</b>	<b>Number of Weeks</b>	<b>Contact Hours</b>
The definition, scope, history, and objectives of ergonomics, as well as a variety of unique characteristics in forest utilization operations in Indonesia	1	2
Basic of human physiology, human organ systems, maximum work capacity, physical workload, physical workload on various wood harvesting activities, fatigue and rest	2	4
Work posture in forest utilization operations	2	4
Types of work accidents and health problems	2	4
Sources of danger, risk assessments, and hazard control	1	2
The status of forestry workers in Indonesia, in terms of cognitive ergonomics	1	2
Risk perception of workers	1	2
Performance appraisal/assessment	2	4
Ergonomic problems in forest utilization operations in Indonesia and its strategies	2	4

<b>F. Course Assessments</b>			
<b>No.</b>	<b>Assessment Type *)</b>	<b>Schedule (Week Due)</b>	<b>Proportion of the Final Mark</b>
1.	Mid-Term Examination	The 8 <sup>th</sup> Week	35%
2.	Final Examination	The 16 <sup>th</sup> Week	35%
3.	Practical Report/ Homework	Minimal 4 times in a semester	30%

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

<b>G. Media Employed</b>
Laptop, LCD, Microphone, White Board, Marker, Pointer

<b>H. Learning Resources</b>
<p><b>h1. Textbooks:</b></p> <ol style="list-style-type: none"> <li>1. Bhattacharya A, McGlothlin J. Editors. 1996. <i>Occupational Ergonomics: Theory and Application</i>. New York (US): Marcel Dekker, Inc.</li> <li>2. Chaffin DB, Anderson GBJ. 1991. <i>Occupational Biomechanics</i>. Second Edition. Canada: John Willey &amp; Sons, Inc.</li> <li>3. ILO. 1983. Penelitian Kerja dan Pengukuran Kerja. Terjemahan dari: <i>Introduction to Work Study, Revised Edition</i>, 1969. Jakarta (ID): LPPM Erlangga.</li> <li>4. Kroemer KHE, Grandjean E. 1997. <i>Fitting the Task to the Human. A textbook of Occupational Ergonomics. Fifth Edition</i>. Great Britain: Taylor &amp; Francis.</li> <li>5. Niebel BW, Freivalds A. 1999. <i>Methods Standards &amp; Work Design</i>. Singapore: McGraw-Hill Companies.</li> <li>6. Singleton WT. 1972. <i>Introduction to Ergonomics</i>. Swizerland: WHO.</li> <li>7. Suma'mur PK. 1977. <i>Kesehatan dan Keselamatan Kerja dalam Pekerjaan Kehutanan dan Industri Perakayuan</i>. Jakarta (ID): Pusat Bina Hiperkes dan Keselamatan Kerja, ILO.</li> <li>8. Yovi EY. 2013. Buku Pintar Perlindungan K3 dalam Kegiatan Penebangan Kayu. Bogor (ID): IPB Press.</li> <li>9. [ILO] International Labour Office. 1998. Keselamatan dan Kesehatan Kerja pada Pekerjaan Kehutanan. Yanri Z, penerjemah; Elias, Widiatmoko P, editor. Geneva: International Labour Office. Terjemahan dari: Safety and Health in Forestry Work.</li> </ol>
<p><b>h2. Journal:</b></p> <ol style="list-style-type: none"> <li>1. Bell JL, Grushecky ST. 2006. Evaluating the effectiveness of a logger safety training program. <i>Journal of safe Research</i> 37(2006):53-61.</li> <li>2. Yamada Y, Yovi EY, Wasterlund DS, Garland JJ, Sowa JM. 2013. The concept of the ergonomic spectrum. <i>Open Journal of Forestry</i> 3(1):8-11. DOI:10.4236/ojf.2013.31002.</li> <li>3. Yovi EY, Gandaseca S, Adiputra IN. 2012. Worker's competency and perception toward safety and health on forest harvesting operation in Indonesian Long Rotation Plantation Forest. <i>Journal of Tropical Forest Management</i> 18(3):198-205. DOI:10.7226/jtfm.18.3.198.</li> <li>4. Yovi EY, Suryaningsih. 2011. Noise, worker perception, and worker concentration in timber harvesting activity. <i>Journal of Tropical Forest Management</i> 17(2):56-62.</li> <li>5. Yovi EY, Takimoto Y, Ichihara K, Matsubara C. 2005. A study of workload and work efficiency in timber harvesting by using chainsaw in pine plantation forest in Java Island: clear cutting operation. <i>Applied Forest Science</i> 14(1):17-26.</li> <li>6. Yovi EY, Yamada Y. A Strategy to disseminate OSH information to the forestry workers: the safety game. <i>Journal of Tropical Forest Research</i>. (In press).</li> <li>7. Yovi EY. 2008. %VO2max as physical load indicator unit in forest work operation. <i>Journal of Tropical Forest Management</i> 14(3):140-145.</li> <li>8. Hignett S, Mc Antamney L. 2000. Technical Note Rapid Entire Body Assessment (REBA). <i>Applied Ergonomics</i> 31: 201-205. [terhubung berkala]. <a href="http://www.safetynet.co.kr//2008227134434123">www.safetynet.co.kr//2008227134434123</a>. [15 Mei 2012]</li> </ol>