



**IPB University**  
— Bogor Indonesia —

# MODUL HANDBOOK

**Department of Silviculture  
Faculty of Forestry and Environment**



**IPB University**  
— Bogor Indonesia —

**Department of Silviculture  
Faculty of Forestry and Environment**

# 1<sup>st</sup> SEMESTER



**IPB100, IPB101, IPB102, IPB103, IPB104, and IPB110 Religion Education**

Module designation	<b>Religion Education</b>
Semester(s) in which the module taught	1 <sup>st</sup> Semester
The person responsible for the module	Irzaman (Coordinator for IPB100) Elisa Ganda Togu Manurung (Coordinator for IPB101) Yohanes Driyanto (Coordinator for IPB102) I Wayan Mangku (Coordinator for IPB103) Hermawan Wana (Coordinator for IPB104) J.S. Gunadi (Coordinator for IPB110)
Lecturer	Team teaching
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture), Student-centered learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to understand human concepts and human relations with religion Able to accustom noble behavior (morals) in the community environment.
Content	Religion Education course is taught in order to equip students with insight in Islamic knowledge comprehensively (broadly and deeply), encourage students to study, study and live the verses of Allah SWT (Qauliyah and Kauniyah) and not to be dichotomous and to give an understanding of human nature who need a guide to life (al Islam), both individually and socially in order to achieve happiness in this world and the afterlife.



Examination forms	Lecture examination (writing test in the midterm and final semester).
Study And examination requirements	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Psychomotor:</b> Problem solving practice <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.
Reading list	Varies depending on religion



**IPB106 Bahasa Indonesia (Indonesian Language)**

Modul designation	<b>Bahasa Indonesia</b>
Semester(s) in which the module Taught	1 <sup>st</sup> Semester
The person responsible for the module	Endang Sri Wahyuni
Lecturer	Team teaching
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture), Student-centered learning
Workload	Lecture class: 50 minutes x 1 sch x 14 weeks = 700 minutes = 12 hours Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 3 times x 14 weeks = 2780 minutes = 46 hours Total: 5400 minutes = 90 hours
Credit points	2 (1-2) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	The student is able to understand and choose the right Indonesian vocabulary; are skilled at writing papers according to their competencies; communicate verbally well; proud to speak Bahasa Indonesia as the basis for applying the field of science according to its competence.
Content	Indonesian Language course includes general subjects. This course is expected to shape the personality of students who are ethical, cultured in Indonesia, and proud of the Indonesian language. The material provided in this course is the history, position and function of the Indonesian language, spelling (letter and punctuation), terminology, effective sentences: diction and reasoning, paragraphs, type of writing (description, narration, exposition, argumentation, and persuasion), reproduction: summary, abstract, or synthesis, quotation, reference system, and bibliography, writing scientific papers, and oral presentation techniques.
Examination forms	Lecture examination (writing test in the midterm and final semester).



Study And Examination requirements	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Psychomotor:</b> Problem solving practices <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.
Reading list	-



**IPB107 Introduction to Agricultural Science**

Modul designation	<b>Introduction to Agricultural Science</b>
Semester(s) in which the module Taught	1 <sup>st</sup> Semester
The person responsible for the module	Prof. Dr. Ir. Hadi Susilo Arifin, M.S.
Lecturer	Prof. Dr. Ir. Kukuh Murtilaksono, M.S. Prof. Dr. Ir. Ahmad Sulaeman, M.S. Dr. Ir. Budi Setiawan, M.S. Prof. Dr. Ir. I. Komang Gede Wiryawan Prof. Dr. Ir. Didi Sopandie, M.Agr. Dr. Ir. Sugeng Santoso, M.Agr Dr. drh. Ligaya ITA Tumbelaka, SpMP., M.Sc
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	After taking this course, students is able to explain agriculture in a broad sense and the supporting sciences.
Content	The course is designed and structured to take IPB students into the world of agriculture in the broadest sense by making various topics related to agricultural sciences beginning with the understanding of scientists and knowledge, agricultural and environmental sciences, agricultural and agricultural business history, weather and climate, energy and photosynthesis, food and nutrition, life cycle, postharvest technology, non-food agriculture, agribusiness and agroindustry, biotechnology and hydroponics, 21st century agricultural vision.
Examination forms	Lecture examination (writing test in the midterm and final semester).



Study and examination requirements	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.
Reading list	<ol style="list-style-type: none"><li>1. AHN: Buku PIP Author AHN (Book 1-Soft File)</li><li>2. KM: Buku Kumpulan Makalah (Book 2-Soft File)</li><li>3. TGM: Buku Tantangan Generasi Muda (Hard File)</li></ol>





**MAT101 Fundamentals of Mathematics**

Modul designation	<b>Fundamentals of Mathematics</b>
Semester(s) in which the module Taught	1 <sup>st</sup> Semester
The person responsible for the module	Ali Kusnanto
Lecturer	Team Teaching from Mathematics Departement
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Student is able to explain basic mathematical concepts (interval, inequality and absolute value; function; limit and continuous function; derivative; integral; matrix; and system of linear equations). 2. Able to use basic mathematical techniques to solve simple mathematical problems. 3. Able to apply basic mathematical concepts and techniques to solve applied problems.
Content	This course discusses the basic concepts of mathematics which include concepts of inequality and absolute value, function and model, limit and continuous function, derivative, integral, matrix and system of linear equations with more emphasis on aspects of calculation
Examination forms	Lecture examination (writing test in the midterm and final semester).



Study and examination requirements	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Psychomotor:</b> Problem solving practice <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort
Reading list	1. Tim Penulis. Diktat Kuliah Landasan Matematika. Departemen Matematika FMIPA IPB, Bogor, 2017.



**KIM101 Chemistry**

Modul designation	<b>Chemistry</b>
Semester(s) in which the module Taught	1 <sup>st</sup> Semester
The person responsible for the module	Team Teaching from Chemistry Departement
Lecturer	Team Teaching from Chemistry Departement
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	After taking this course, students will be able to explain the chemical linkages in life processes related to aspects of daily life
Content	This course is given to equip students about the basic concepts of chemistry that are conveyed simply and popularly, including the understanding and importance of chemistry, understanding of atoms and atomic structure, core chemistry, chemical bonds, names, formulas, and chemical equations, acids / bases, oxidation and reduction, organic chemistry and polymers, energy, chemical chemistry, food chemistry, chemotherapy and toxicology.
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study And examination requirements	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Psychomotor:</b> Practice <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role,
Reading list	-



**BIO100 Biologi 3(2-3)**

Modul designation	<b>Biology</b>
Semester(s) in which the module Taught	1 <sup>st</sup> Semester
The person responsible for the module	Team Teaching from Biology Departement
Lecturer	Team Teaching from Biology Departement
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	1. Registered in this course 2. Minimum 80% attendance in this course
Module objectives/intended learning outcomes	1. Explaining the scope of biology, observe and explain the structure and metabolism of cells. 2. Observing and explaining the basic cellular reproduction and patterns of inheritance. 3. Observing and explaining the structure and expression of genes, and biotechnology. 4. Observing and explaining the diversity, structure and biological functions of organisms: monera, protists, fungi, plantae, animalia. 5. Observing and explaining the ecology: population, community, ecosystem and bioconservation.



Content	This course explains the theories and basic principles of biology that form the basis for further courses in the major / department. The lecture begins by explaining the scope of biology and the origins of life, then proceeding to the Midterm Examination, lectures explaining the structure and function of biology at the cellular level, genetics and its application in biotechnology. In the next section until the Final Examination, the lecture explains about biodiversity and biological functions at the level of organisms (monera, protists, fungi, plantae, and animalia), population, community, ecosystem, and conservation biology.
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirement	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Psychomotor:</b> Practice <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.Effort.
Reading list	1. Jane B. Reece, Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Robert B. Jackson. 2014. Campbell Biology.10th. Pearson Education, Inc. 2. Neil A. Campbell, Jane B. Reece. 2008. Biology 8th. Pearson Benjamin Cummings: San Francisco.



**EKO100 General Economics**

Modul designation	General Economics
Semester(s) in which the module Taught	1 <sup>st</sup> Semester
The person responsible for the module	Team Teaching from Economics Science Departement
Lecturer	Team Teaching from Economics Science Departement
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Discussion class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	After attending this course, student is able to understand of economics as a branch of science, understand the behavior of households, companies and markets in economic decision making, understand macroeconomics, problems and the actual conditions of Indonesian macroeconomics.
Content	This course provides a general overview of economics, economic agents, demand, supply, budget lines and indifference curves, production and costs, market structure, key macroeconomic variables, national income, changes in national income, fiscal policy and monetary policy
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Psychomotor:</b> Practice <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.



Reading list	<ol style="list-style-type: none"><li>1. Books for lecture class: Lipsey. R. G., P. O Steiner, and D. D. Purpis. 1987. Economics. Harper International Edition.</li><li>2. Books for practical class:<ol style="list-style-type: none"><li>a. Penuntun Responsi Ekonomi Umum. 2013. Departemen Ilmu Ekonomi (IE), Fakultas Ekonomi dan Manajemen (FEM). IPB.</li><li>b. Lipsey. R. G., P. O Steiner, and D. D. Purpis. 1987. Economics. Harper International Edition.</li><li>c. Gregory, M. 2006. Principles of Economics (Pengantar Ekonomi Mikro) Edisi 3. Salemba Empat.</li></ol></li></ol>
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# 2<sup>nd</sup> SEMESTER





**IPB111 Pendidikan Pancasila (Civics Education)**

Modul designation	<b>Civics Education</b>
Semester(s) in which the module Taught	2 <sup>nd</sup> Semester
The person responsible for the module	Didid Diapari
Lecturer	Siti Rahmawati Indah Wijayanti Fana Dewi Savitri Sri Rahayu Ujang Sehabudin Gunter Sedarnawati Yasni Sri Rachjati Eidman Parlaungan Rangkuti
Language	Bahasa Indonesia (Indonesia language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture), Student-centered learning
Workload	Lecture class: 50 minutes x 1 sch x 14 weeks = 700 minutes = 12 hours Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 3 times x 14 weeks = 2780 minutes = 46 hours Total: 5400 minutes = 90 hours
Credit points	2 (1-2) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <li>1. Students understand the vision, mission and goals of Civics Education.</li> <li>2. Students identify disturbances and threats to the nation and the Republic of Indonesia and state defense efforts adapted to global challenges.</li> <li>3. Students is able to analyze the formation of the Republic of Indonesia based on history and elements of the the state formation, analyze the concept of national integration.</li> <li>4. Student is able to explain the meaning of nationalism.</li> <li>5. Student is able to analyze the importance of the state constitution</li> <li>6. Student is able to describe the atmosphere when making the 1945 Constitution.</li> </ol>



	<ol style="list-style-type: none"><li>7. Student is able to explain the meaning of the Preamble of the 1945 Constitution and its relationship with the Proclamation of Independence and the Body</li><li>8. Student is able to compare the implementation of the 1945 Constitution from time to time</li><li>9. Student is able to analyze and show changes in amendments to the 1945 Constitution, especially in state institutions as executors of people's sovereignty</li><li>10. Student is able to explain Pancasila as a system of philosophy and unity of precepts in Pancasila.</li><li>11. Student is able to analyze Pancasila as a source of values.</li><li>12. Describe the meaning of Pancasila as the basis of the state, comparing Pancasila as an open ideology with other ideologies, and its function as well as a national development paradigm.</li><li>13. Student is able to explain the problem of Indonesian citizenship.</li><li>14. Student is able to categorize the rights and obligations of Indonesian citizens.</li><li>15. Student is able to link the implementation of democracy with the enforcement of human rights.</li><li>16. Analyzing the implementation of democracy in Indonesia since the old order, new order and reform</li><li>17. Analyzing the efforts to promote, respect and uphold human rights in Indonesia and the world.</li><li>18. Student is able to relate the concept of geopolitics and archipelago insight.</li><li>19. Student is able to explain the concept of Indonesian territory.</li><li>20. Student is able to describe the implementation of national insights in national development.</li><li>21. Student is able to explain Indonesia's national resilience and implementation</li><li>22. Student is able to explain analyzing problems and formulating politics and national strategies.</li><li>23. Student is able to explain the principles of good governance in public organizations and state administration.</li></ol>
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	<p>24. Student is able to explain the implementation of regional autonomy.</p> <p>25. Student is able to categorize corrupt acts and the importance of efforts to prevent corruption.</p>
Content	<p>Civics education gives understanding to students as the next generation to apply the fundamental values of the nation and state of Indonesia in effort to strengthen awareness of national defense, strengthen attitudes and behaviors of citizens, master in knowledge of the basic problems of national and state life, and to be pro-active towards change. That occurs in order to realize the integration of science and technology and development.</p>
Examination forms	<p>Lecture examination (writing test in the midterm and final semester).</p>
Study and examination requirements	<p><b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments</p> <p><b>Psychomotor:</b> Practice</p> <p><b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort</p>
Reading list	<ol style="list-style-type: none"><li>1. Membangun Kesadaran Bela Negara Dr. Ir. Parlaungan Adil Rangkuti, M.Si. IPB Press</li><li>2. Paradigma Baru Pendidikan Kewarganegaraan. Winarno, S.Pd, M.Si. PT. Bumi Aksara: 2008</li><li>3. Cerdas Kritis dan Aktif Berwarganegara, Pendidikan Kewarganegaraan Untuk Perguruan Tinggi. Heru Herdiawanto, M.Si dan Jumanta Hamdayama, M.Si, Erlangga: 2010</li><li>4. Panduan Kuliah Pendidikan Pancasila</li></ol>



**IPB108 English**

Modul designation	<b>English</b>
Semester(s) in which the module Taught	2 <sup>nd</sup> Semester
The person responsible for the module	Tatie Sadewo
Lecturer	Alfa Chasanah Nilawati Irma Rasita Gloria Barus Muhammad Thonthowi Djauhari Gatot Widodo Ahmad Ridha Amita Nucefera Nida Silma Raden Adjeng Sri Sugyaningsih Gifita Firdiana Harries Marithasari Lukman Gandarmaya Rizdika Mardiana Yose Eduar Muda Reny Astiyarini Umas Widharto
Language	English
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (Face to face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students are able to applying "reading skills" in understanding texts in English, know the structure of language to support understanding of texts in English;
Content	This course describes the techniques and strategies for understanding an English reading text and sentence structure related to reading / discourse in English
Examination forms	Lecture examination (writing test in the midterm and final semester).



Study and examination requirements	<p><b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments</p> <p><b>Psychomotor:</b> Practice</p> <p><b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.</p>
Reading list	<ol style="list-style-type: none"><li>1. Abdulaziz, Helen Taylor, &amp; Alfred D. Stover. 1980. Academic Challenges in Reading. Prentice-Hall, Inc. Englewood Cliffs, N.J.</li><li>2. Anson M. Chris, Schwegler A. Robert. 2001. The Longman Handbook for Writers and Readers, An Imprint of Addison Wesley Longman, Inc. 3. Dobbs, Carrie. 1989. Reading for a Reason. Prentice Hall Regents Englewood Cliffs, N.J.</li></ol>



**FIS100 Fisika**

Modul designation	<b>Physics</b>
Semester(s) in which the module Taught	2 <sup>nd</sup> Semester
The person responsible for the module	Team Teaching from Physics Departement
Lecturer	Team Teaching from Physics Departement
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Student is able to use various physical formulations in the scope of solving simple physics problems and applying them to other fields
Content	This course describes the techniques and strategies for understanding an English reading text and sentence structure related to reading / discourse in English
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	<b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments <b>Psychomotor:</b> Practice <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c)
Reading list	



**KPM130 General Sociology**

Modul designation	<b>General Sociology</b>
Semester(s) in which the module is Taught	2 <sup>nd</sup> Semester
The person responsible for the module	Team Teaching from Communication Science and Human Development Departement
Lecturer	Team Teaching from Communication Science and Human Development Departement
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture), Student- centered learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-2) sch = 4.8 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	After attending this course student is able to understand the concepts, analyze situations and social changes in society, and identify social realities and problems at the level of groups, organizations, institutions, communities, and global by considering power and authority, ecology and gender. In addition, student is able to conduct sociological studies, communicate the results of studies for decision making based on qualitative and quantitative approaches that can be accounted for.
Content	This course explains the history and development of Sociology; Sociology as an Perspective; Social Interaction and Structure; Society and Culture; Social Institutions; Group; Organization and Bureaucracy; Social Stratification; Power and Authority; Communication Patterns, Forms of Society and Patterns of Ecological Adaptation; Gender and Development; and Social Change and Development
Examination forms	Lecture examination (writing test in the midterm and final semester).



<p>Study and examination requirements</p>	<p><b>Cognitive:</b> Midterm exam, Final exam, Quizzes, Assignments  <b>Psychomotor:</b> Practice  <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.</p>
<p>Reading lists</p>	<ol style="list-style-type: none"> <li>1. Soekanto, S., 1990. Sosiologi Suatu Pengantar. Jakarta: Rajawali Press.</li> <li>2. Geertz, C. 1976. Agricultural Involution: process of ecological change in Indonesia. Berkeley: University of California Press.</li> <li>3. Herskovits, M.J. 1955. Cultural Anthropology. New York: Alfred A. Knopf.</li> <li>4. Koentjaraningrat (Ed.). 1979. Manusia dan Kebudayaan di Indonesia. Jakarta: Penerbit Djambatan.</li> <li>5. Kluckhohn, F.R. 1961. "Dominant and variant value-orientation" in: FR Cluchohn &amp; HA 25 Murray (Eds.), Personality in Nature, Society and Culture. New York: Alfred A Knoff.</li> <li>6. Redfield, R. 1956. Peasant society and culture. Chicago: University of Chicago Press.</li> <li>7. Tan, M.G. 1973. "Masalah perencanaan penelitian" dalam Koentjaraningrat (Ed.), Metode-metode Penelitian Masyarakat. Jakarta: LIPI.</li> <li>8. Dorn, J.A.A. van &amp; C.J. Lammers. 1959. Modern Sociologie een sijstematische inleiding. Utrecht Antwerpen: Het Spectrum.</li> <li>9. Charon, J.M. 1980. The Meaning of Sociology. Alfred Publishing Co. Inc. America.</li> <li>10. Calhoun, C., et.al. 1994. Sociology (6th edition). McGraw-Hill, Inc. USA.</li> <li>11. Wibisono, Koento. 1982. Arti Perkembangan Menurut Filsafat Positivisme Auguste Comte. Yogyakarta: Gadjah Mada University Press.</li> <li>12. Gillin, J.L. &amp; J.P. Gillin, 1954. Cultural Sociology (3rd printing). New York: The Macmillan Co.</li> <li>13. Maiolo, J., et.al., 1991. Study Guide to Accompany Bassis, Gelles and Levine: Sociology An Introduction. McGraw-Hill, Inc. USA.</li> <li>14. MacIver, R.M. &amp; C.H. Page. 1957. Society and Introductory Analysis. New York: Rinehart and Company, Inc.</li> <li>15. Merton, R.K. 1967. Social Theory and Social Structure. New York: The Free Press. Polak,</li> <li>16. J.B.A.F.M. 1966. Sosiologi: Suatu Buku</li> </ol>





**AGB100 Introduction to Entrepreneurship**

Modul designation	<b>Introduction to Entrepreneurship</b>
Semester(s) in which the module is Taught	2 <sup>nd</sup> Semester
The person responsible for the module	Burhanuddin
Lecturer	Team Teaching from Agribusiness Departement
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 1 sch x 14 weeks = 700 minutes = 12 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 2 times x 14 weeks = 1760 minutes = 29 hours Total: 2700 minutes = 45 hours
Credit points	1 (1-0) sch = 1.6 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	After taking this course, students will have new insights about the entrepreneurial potential and be motivated to develop themselves and be able to change the way of thinking in developing the entrepreneurial spirit.
Content	This course discusses the understanding and principle of entrepreneururships the nature and characteristics of entrepreneurs, the introduction and development of entrepreneurial personality, motivation and opportunities for entrepreneurships, entrepreneurial characters, entrepreneurial ideas,and basic business planning
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	<b>Cognitive:</b> Assignment <b>Psychomotor:</b> - <b>Affective:</b> Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort.
Reading list	1. Ciputra. 2009. Ciputra Quantum Leap Entrepreneurship Mengubah Masa Depan Bangsa dan Masa Depan Anda. PT Elex Mediacomputindo, Jakarta. 2. Drucker, Peter, F. 1991. Inovasi dan Kewiraswastaan, Praktik dan Dasar-dasar. Alih Bahasa oleh Rusjdi Naib. Penerbit Erlangga. 3. Longenecker, Justin G. Carlos W. Moore, J. William Petty. 2000. Kewirausahaan, Manajemen Usaha Kecil. Penerbit Salemba Empat.



**IPB University**  
— Bogor Indonesia —

**Department of Silviculture  
Faculty of Forestry and Environment**



**MNH201 Introduction to Forestry Science & Environmental Ethic**

Modul designation	<b>Introduction to Forestry Science &amp; Environmental Ethic</b>
Semester(s) in which the module is Taught	2 <sup>nd</sup> Semester
The person responsible for the module	Endang Suhendang
Lecturer	Dudung Darusman Bahruni
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	Students having the ability to comprehend a number of concepts, definitions and requirements, functions and benefits of forests, forest activities, as well as forestry science and environmental ethics.
Content	<ol style="list-style-type: none"> <li>1. Introduction and Scope of Forestry Science</li> <li>2. Role of Forestry Science in Humans' Life</li> <li>3. Development of Scope of Forestry Science; Position of Introduction to Forest Science in Forestry Science</li> <li>4. Definition of Forest; Forest Classification; Forestry as Activity, Science, Profession, and System Roles, Functions, and Benefits of Forests in Humans' Life</li> <li>5. Forest Condition in IndonesiaForester as a Profession and Professional</li> <li>6. International Forestry</li> <li>7. Basic of Environmental Ethics</li> </ol>
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students' achievement using proportion as follow: midterm exam (50%) and final exam (50%)



Reading list	<ol style="list-style-type: none"><li>1. Suhendang E. 2013. Pengantar ilmu kehutanan: Kehutanan sebagai Ilmu Pengetahuan, Kegiatan, dan Bidang Pekerjaan. Bogor (ID): IPB Press 2.</li><li>2. Suhendang E. 2013. Perkembangan Paradigma Kehutanan. Diskusi pengelolaan hutan berbasis ekosistem sebagai pendekatan untuk pengelolaan hutan Indonesia dalam paradigma kehutanan Indonesia baru. Bogor (ID): Indonesia.</li></ol>
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**KSH201 Bio-Resources Conservations**

Modul designation	<b>Bio-Resources Conservations</b>
Semester(s) in which the module is Taught	2 <sup>nd</sup> Semester
The person responsible for the module	Sambas Basuni
Lecturer	Sambas Basuni Agus Priyono Kartono Harnios Arief Burhanuddin Masyud Lin Nuriah Ginuga Yeni Mulyani Aryati
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	The student having the ability to explain the definition, purpose and basic concepts of conservation of natural resources; to comprehend conservation issues and scarcity and extinction factors, as well as the basic principles and strategies for conserving biological natural resources and their ecosystems
Content	Definitions and Objectives of Biological Resources Conservation Conservation Movements The Concept of Natural Resources The Principles of Conservation Ecology The Conceptual Basic for Conservation of Biological Resources Scarcity and Extinction Conservation Strategies of Biological Resources
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study And Examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)



Reading list	<ol style="list-style-type: none"><li>1. Borrini-Feyerabend G. 1999. Collaborative Management of Protected Areas (in Partnerships for Protection: New Strategies for Planning and Management for Protected Areas edited by Stolton, Sue and Nigel Dudley). London (UK): IUCN-The World Conservation Union, Eartscan Publications Ltd. Pp: 224-234.</li><li>2. Brandon KE, Wells M. 1992. Planning for People and Parks: Design Dillemas. Journal World Development Vol. 20 No. 4. Great Britain (UK): Pergamon Press Ltd. Pp:557-570</li><li>3. Conservation. IUCN-The World Conservation Union, Gland-Switzerland. Pp: 215-222</li><li>4. Hess Jr K. 2001. Parks Are for People – But Which People? in The Politics and Economics of Park Management, Edited by Terry L. Anderson and Alexander James. Rowman and Littlefield Publisher. Oxford. Pp. 159-181.</li><li>5. IUCN. 1992. Protected Areas and Demographic Change: Planning for the Future (A Working Report of Workshop 1.6). IVth World Congress on National Parks and Protected Areas held in Caracas, Venezuela 10-21 February 1992, IUCN The World Conservation Union, Gland, Switzerland.</li><li>6. Lewis C (Ed.). 1996. Managing Conflicts in Protected Areas. IUCN The World Conservation Union, Gland-Switzerland.</li><li>7. MacKinnon J, MacKinnon K, Child G, Thorsell J. 1986. Managing Protected Areas in the Tropics. International Union for Conservation of Nature and Natural Resources (IUCN). Gland-Switzerland.</li></ol>
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8. McNeely JA. 1999. Mobilizing Broader Support for Asia's Biodiversity: How Civil Society Can Contribute to Protected Area Management. Asian Development Bank – The World Conservation Union, Manila, the Philippines
9. Meganck RA, Saunier RE. (Eds.). 1995. Conservation of Biodiversity and the New Regional planning. Department of regional Development and Environment, Executive Secretariat for Economic and Social Affairs, General Secretariat of Organization of American States – IUCN The World Conservation Union.
10. Sayer J. 1991. Buffer Zones in Rainforest: Fact or Fantasy?. PARKS the international magazine dedicated to the protected areas of the world. Vol. 2 No. 2, July 1991 (System Planning): 20-24.
11. UNDP/FAO National Park Development Project. 1982. Rencana Konservasi Nasional Jilid I: Pendahuluan, Metoda Evaluasi dan Tinjauan Kekayaan Alam (berdasarkan karya John MacKinnin-FAO).
12. Wells M, Brandon KE (with Lee Hannah). 1995. People and Parks: Linking Protected Area Management with Local Communities (3rd Ed.). Washington, D.C (US): The World Bank, WWF, and USAID.
13. Westley F, Seal U, Byers O, Ness GD. People and Habitat Protection. PARKS Protected Areas Programme (the International Journal for Protected Area Managers Vol. 8 No 1. February 1998). Cambridge (UK): IUCN – The Conservation Union. (p:15-26).



# 3<sup>rd</sup> SEMESTER





**SVK211 Dendrology**

Modul designation	<b>Dendrology</b>
Semester(s) in which the module is Taught	3 <sup>rd</sup> Semester
The person responsible for the module	Iwan Hilwan
Lecturer	Istomo Agus Hikmat Bayu Winata Fifi Gusdwiyanti
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, Collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and prerequisites for joining	Biology
Module objectives/intended learning outcomes	Able to explain definitions, understand deeply about tree morphology, and describe important botanical characteristics of several tribes, genera, and tree species. In addition, students are expected to have skills in the introduction of important tree species in the forestry sector, at least 60 species.
Content	Dendrology is one of the basic science courses in the field of forestry which describes the definition of "trees", tree morphology (botanical properties), principles of plant taxonomy, forest botanical exploration activities, as well as discussion of several tribes, genera, and species-species of trees that are important in forestry and forest ecosystems.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students' achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (40%), quiz (10%), herbarium (25%), and practicum examination (25%).



Reading list	<ol style="list-style-type: none"><li>1. Harlow, W.M. and E.S. Harrar. 1985. Textbook of Dendrology. Mc Graw Hill Book Co., Inc. New York.</li><li>2. Keng, H. 1978. Orders and Families of Malayan Seed Plant. Singapore University Press. Singapore.</li><li>3. Lawrence, G.H.M. 1951. Taxonomy of Vascular Plants. MacMillan Publishing Co., Inc. New York.</li><li>4. Samingan, T. 1985. Dendrologi. Gramedia. Jakarta.</li><li>5. Tjirosoepomo, G. 1985. Morfologi Tumbuhan. Gajah Mada University Press. Yogyakarta</li><li>6. Heyne K. 1987. <i>Tumbuhan Berguna Indonesia. Jilid II</i>. Jakarta (ID): Badan Litbang Kehutanan.</li><li>7. Prawira, S.A dan IGM Tantra. 1973. Pengenalan Jenis-jenis Pohon Penting (89 jenis). Lembaga Penelitian Hutan. Bogor.</li><li>8. PROSEA. 1995. Plant Resource of South-East Asia 5 : (1) Timber Trees : Major Commercial Timbers. Bogor.</li><li>9. PROSEA. 1995. Plant Resource of South-East Asia 5 : (2) Timber Trees : Minor Commercial Timbers. Bogor.</li><li>10. Steenis CGGJ van. 1972. <i>Flora Pegunungan Jawa</i>. Kartawinata JA, penerjemah. Bogor (ID): Pusat Penelitian Bogor LIPI. Terjemahan dari: <i>The Mountain Flora of Java</i>.</li><li>11. Wirjodarmodjo. 1959. Pohon-pohon Terpenting di Indonesia Seri I. Pengumuman No. 71. Lembaga Penelitian Hutan. Bogor.</li></ol>
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**SVK222 Silvics**

Modul designation	<b>Silvics</b>
Semester(s) in which the module is taught	3 <sup>rd</sup> Semester
The person responsible the module	Sri Wilarso Budi
Lecturer	Irdika Mansur Arum Sekar Wulandari Andi Sukendro
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain environmental factors that affect tree growth and reproduction and forest stand formation as well as identify and understand environmental factors that can affect tree growth
Content	It is a major subject taught by the Silviculture Laboratory and taught to all students of the Faculty of Forestry of IPB who take the Silviculture major. This course discusses climatic, edaphic, water, biology, physiography factors and the interaction of these factors in influencing tree growth, regeneration and formation of forest stands. Tree Ecophysiology, Planning for Plantation Forest Development, Nurseries, Nursery Technology, Maintenance and Inventory of Saplings in Natural Forests. The influence of forests on the environment is also discussed in this course.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (50%), quiz (15%), attendance (10%), and practicum examination (25%).



Reading list

1. Etherington, J.R. 1976. Environment and Plant Ecology. Wiley Eastern Limited, New Delhi.
2. Kozlowski, T.T. and Pallardy, S.G. 1997. Physiology of Woody Plants. Academic Press. London.
3. Kozlowski and Kramer. 1960. Physiology of Trees. McGraw-Hill Book Company, New York.
4. Sangham, S.S. 1980. Silvics. Forestry training Unit Forestry Department, Peninsular, Malaysia.
5. Soekotjo. 1974. Silvika. Bagian Pendidikan Sekretariat Direktorat Jenderal Kehutanan.
6. Wiratmoko, S. 1977. Departemen Manajemen Hutan Fakultas Kehutanan IPB, Bogor.



**SVK214 Basics of Tree Physiology**

Modul designation	<b>Basics of Tree Physiology</b>
Semester(s) in which the module is taught	3 <sup>rd</sup> Semester
The person responsible for the module	Sri Wilarso Budi R
Lecturer	Arum Sekar Wulandari
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain and practice physiological processes in trees and their application in silviculture
Content	The physiological role of trees in forest development; cell structure and function; tree growth; photosynthesis; carbohydrate; water absorption and transpiration; assimilation and respiration; absorption, translocation and accumulation; hormones and growth regulators; mineral nutrition and salt uptake; enzymes and vitamins
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (50%), quiz (15%), attendance (10%), and practicum examination (25%).
Reading list	1. Kozlowski TT, Pallardy SG. 1997. <i>Physiology of Woody Plants</i> . London: Academic Press. 2. Kozlowski, Kramer. 1960. <i>Physiology of Trees</i> . New York: McGraw-Hill Book Company. 3. Mulkey SS, Chazdon RL, Smith AP. 1996. <i>Forest Plant</i>



*Ecophysiology*. New York: Chapman and Hall.  
4. Sinha RK. 2004. *Modern Plant Physiology*. England: Alpha Science International Ltd.



**SVK233 Forest Microbiology**

Modul designation	<b>Forest Microbiology</b>
Semester(s) in which the module is taught	3 <sup>rd</sup> Semester
Person responsible for the module	Achmad
Lecturer	Elis Nina Herliyana Yunik Istikorini M. Alam Firmansyah
Language	Bahasa Indonesia
Relation to curriculum	Elective Course
Teaching methods	Textual Learning, Cooperatif learning, Discussion
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Biology
Module objectives/intended learning outcomes	1. Students can explain microbes in forests that are beneficial and detrimental to humans, as well as the taxonomy and biology of the microbes, from groups of fungi, bacteria, nematodes, viruses, and mycoplasma. 2. Students can explain the function and working principles of equipment in the laboratory, make breeding media, detect, isolate and maintain pure breeding of forest microbes, and utilize fungi consumption.
Content	This course describes microbes in forests that are beneficial and detrimental to humans and the taxonomy and biology of the microbes, from the groups of fungi, bacteria, nematodes, viruses, and mycoplasmas.
Examination forms	The assessment includes student presentations and group assignment reports, Essay Test, attendance and class activities
Study and examination requirements	Midterm exam 30% Final exam 30% The assignment of practice report 30% Structured assignment 10% If student attending the lectures >80% so they can join the exam
Media employed	Text books, slides (power points), and films



Reading list

- 1 Agrios GN. 1997. Plant Pathology. Tokyo. Acad. Pres Tokyo. 635 p.
- 2 Alexander, M. 1977. Introduction to soil microbiology. John Wiley & Sons, New York. 467 p.
- 3 Alexopoulos CJ, CW Mims. 1996. Introductory Mycology. Fourth Edition. John Wiley & Son. Inc. New York. 632 p.
- 4 Atlas, R.M. and R. Bartha. 1981. Microbial ecology: fundamentals and applications. Addison-Wesley Publ. Co., Reading – Massachusetts. 560 p.
- 5 Baker, K.F. and R.J. Cook. 1974. Biological control of plant pathogens. W.H. Freeman and Co., San Francisco. 433 p.
- 6 Beringer, J.E., N. Brewin, and W.B. Johnston., 1982. Symbiotic nitrogen fixation in plants, p. 43-50. In M.E. Rhodes-Roberts and F.A. Skinner (eds.) Bacteria and Plants. Academic Press, London.
- 7 Blanchard R.O. and T.A. Tattar. 1981. Field and laboratory guide to tree pathology. Academic Press, New York. 285 p.
- 8 Boyce, J.S. 1961. Forest pathology. McGraw-Hill Book Co. Inc., New York. 572 p.
- 9 Brown, M.E. 1982. Nitrogen fixation by free-living bacteria associated with plants – fact or fiction?, p. 25-42. In M.E. Rhodes-Roberts and F.A. Skinner (eds.) Bacteria and Plants. Academic Press, London.
- 10 Campbell, R. 1985. Plant microbiology. Edward Arnold, London. 191.
- 11 Englander, L. 1983. Endomycorrhizae by septate fungi, p.11-14. In J.C. Frankland, J.N. Hedger, and M.J. Swift (eds.) Decomposer Basidiomycetes: Their Biology and Ecology. Cambridge Univ. Press, London.
- 12 Freundt, E. A., 1981. Isolation, characterization, and identification of spiroplasmas and MLOs, p. 1-34. In K. Maramorosch and S.P Raychaudhuri (eds.) Mycoplasma Diseases of Trees and Shrubs. Academic Press, New York.
- 13 Hering, T.F. 1982. Decomposition by basidiomycetes in forest litter, p. 213-226. In J.C. Frankland, J.N. Hedger, and M.J. Swift (eds.) Decomposer Basidiomycetes: Their Biology and Ecology. Cambridge Univ. Press, London.
- 14 Jacobs, K.A. 2001. Fungi, p.23-25. In R.K. Jones and D.M. Benson. (eds.) Diseases of Woody Ornamentals and Trees in Nursery. APS Press, St. Paul, Minnesota.
- 15 Levy, J.F. 1982. The place of basidiomycetes in the decay of wood in contact with ground, p. 161-178. In J.C. Frankland, J.N. Hedger, and M.J. Swift (eds.) Decomposer Basidiomycetes: Their Biology and Ecology. Cambridge Univ. Press, London.





15. Luria , S.E., J.E. Darnell, Jr., D. Baltimore, and A. Campbell. 1978. General virology, 3rd ed. John Wiley & Sons, NY. 578 p. Manion, P.D. 1981. Tree disease concepts. Prentice-Hall, New Jersey. 399 p.
16. Mercer, P.C. 1982. Basidiomycetes decay in standing trees, p. 143-160. In J.C. Frankland, J.N. Hedger, and M.J. Swift (eds.) Decomposer Basidiomycetes: Their Biology and Ecology. Cambridge Univ. Press, London.
17. Miller, O.K. 1983. Taxonomy of ecto- and ectendomycorrhizal fungi, p. 91-102. In J.C. Frankland, J.N. Hedger, and M.J. Swift (eds.) Decomposer Basidiomycetes: Their Biology and Ecology. Cambridge Univ. Press, London.
18. Pacioni, G. 1985. The Macdonald encyclopedia of mushrooms and toadstools. Macdonald Book, London. 512 p.
19. Tainter, F.H. and F.A. Baker. 1996. Principles of forest pathology. John Wiley & Sons, New York. 805 p.
20. Trappe, J.M. and N.C. Schenck. 1983. Vesicular-arbuscular mycorrhizal fungi (Endogonales), p. 1-10. In N.C Schenck (ed.) Methods and Principels of Mycorrhizal Research. The Amer. Phytopathol. Soc., St. Pul – Minnesota.
21. Zoberi, M.H. 1972. Tropical macrofungi, some common species. MacMillan, London. 158 p..



**STK211 Statistical Methodology**

Modul designation	<b>Statistical Methodology</b>
Semester(s) in which the module is Taught	3 <sup>rd</sup> Semester
The person responsible for the module	Budi Prihanto
Lecturer	Muhdin Tatang Tiryana Priyanto
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Discussion class: 60 minutes x 2 sch x 14 week = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-2) sch = 4.8 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	The students having the ability to comprehend the basic principles of statistical methods and they are able to apply several simple statistical methods to analyze data.
Content	<ol style="list-style-type: none"> <li>1. Scope of Statistics</li> <li>2. Data Description</li> <li>3. Basic Concepts of Probability</li> <li>4. Populations, Sample, Random Variables, and Distribution of Random Variable Probability</li> <li>5. Sampling Distribution</li> <li>6. Parameter Estimation</li> <li>7. The Concept of Hypothesis Testing; Hypothesis Testing of A Single Population</li> <li>8. Hypothesis Testing of Two Population</li> <li>9. Correlation and Simple Linear Regression</li> <li>10. Categorical Data Analysis</li> </ol>
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and Examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%).



Reading list	<ol style="list-style-type: none"><li data-bbox="552 174 1315 291">1. Hurtsbinger DV, Bilingsley PP. 1987. Element of Statistical Inference. 6th ed. Boston (US): Allyn and Bacon. 28.</li><li data-bbox="552 291 1315 418">2. Koopmans LH. 1987. Introduction to Contemporary Statistical Methods 2nd ed. Boston (US): Duxbury Press.</li></ol>
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**HHT201 Forest Products as Raw Materials**

Modul designation	<b>Forest Products as Raw Materials</b>
Semester(s) in which the module is Taught	3 <sup>rd</sup> Semester
The person responsible for the module	Imam Wahyudi
Lecturer	Imam Wahyudi Suchahyo Sadiyo Naresworo Nugroho Lina Karlina Istie Sekartining Rahayu Anne Carolina Irsan Alipraja
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 80 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and prerequisites for joining the	-
Module objectives/intended learning outcomes	The student having the ability to determine the processing and optimum utilization of wood, coconut stems, oil palm trunks, rattan and bamboo based on the characteristics of the anatomical structure, physical properties, mechanical properties, and chemical components of wood.
Content	<ol style="list-style-type: none"> <li>1. Wood Growth and Formation</li> <li>2. Anatomical Structure of Hardwood, Softwood, and Palmwood</li> <li>3. Water Content, Density, and Specific Gravity</li> <li>4. Wood Shrinkage and Dimensional Stability</li> <li>5. Reaction of Wood to Heat, Electricity, and Voice (sound)</li> <li>6. Mechanical Properties of Wood and Basic Statics</li> <li>7. Factors that Influence Mechanical Properties</li> <li>8. Basic Stress and Allowable Stress</li> <li>9. The Main Chemical Components of Cell Wall Constituent</li> <li>10. The Secondary Chemical Components of Cell Wall Constituent</li> </ol>



Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)
Reading list	<ol style="list-style-type: none"><li>1. Bowyer JL, Shmulsky R, Haygreen JG. 2003. Forest Products and Wood Science: An Introduction. Iowa (US): Iowa State Press.</li><li>2. Fengel D and G Wegener. 1984. Wood: Chemistry, Ultrastructure, Reactions. Berlin (DE): Walter de Gruyter.</li><li>3. Forest Products Laboratory General Technical. 1999. Wood Handbook: Wood as an Engineering Material. Forest Products Society, US Department of Agriculture, USA.</li><li>4. Panshin, AJ and Carl de Zeeuw. 1987. Textbook of Wood Technology. 4-th Edition. Vol. I. New York (US): McGraw-Hill Book Company.</li><li>5. Tsoumis G. 1991. Science and Technology of Wood: Structure, properties and Utilization. New York (US): Van Nostrand Reinhold.</li><li>6. Mardikanto TR, L Karlinasari, ET Bahtiar. 2011. Sifat Mekanis Kayu. Bogor (ID): IPB Press.</li><li>7. Sjostrom E. 1981. Wood Chemistry. Fundamental and Applications. New York (US): Academic Press.</li></ol>



**HHT202 Forest Products Processing**

Modul designation	<b>Forest Products Processing</b>
Semester(s) in which the module is Taught	3 <sup>rd</sup> Semester
The person responsible for the module	I Wayan Darmawan
Lecturer	I Wayan Darmawan Dede Hermawan Istie Sekartining Rahayu Irsan Alipraja Lukmanul Hakim Zaini
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 80 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	The student having the ability to comprehend the basics of forest product processing technologies which include aspects; raw materials, processing technology, nature and quality of products, product uses, and development prospects.
Content	Wood Sawmill, Wood Drying, Wood Preservation, Plywood, Particle Board, Fiberboard, Pulp and Paper, Non-Timber Forest Products, Alternative Energy
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students' achievement using proportion as follow: midterm exam (50%) and final exam (50%) (3



Reading list	<ol style="list-style-type: none"><li>1. Baldwin RF. 1995. Plywood and Veneer-Based Products: Manufacturing Practices.</li><li>2. Miller Freman Books.</li><li>3. Casey JP. 1980. Pulp and Paper: Chemistry and Chemical Technology. Vol. I dan II. New York (US): John Wiley &amp; Sons Publ.</li><li>4. Fadlinurjaji LM, Ruhendi S. 1980. Diktat Penggergajian. Bogor (ISD: Fahutan IPB).</li><li>5. FAO. Noil-Wood Forest Products. Rome: FAO.</li><li>6. Fearer H, et.al. 1975. Wood Materials and Processes. Illinois (US): Chas A. Bennett Co. Inc.</li><li>7. Haygreen JG, Bowyer JL. 1982. Forest Products and Wood Science: An Introduction. Iowa State Chem. Press. 55.</li><li>8. Hunt GM, Garratt GA. 1986. Wood Preservation. USA: The American Forestry Series.</li><li>9. Koch P. 1964. Wood Machining Process. New York (US): Ronald Press.</li><li>10. Kollmann FFP, Kucuzi IIW, Stamm AJ. 1991. Principle of Wood Science and Technology. Vol I dan II. Berlin (DE): Springer-Verlag.</li><li>11. Maloney TM. 1977. Modern Particleboard and Dry-Process Fiberboard Manufacturing. San Fransisco (US): Miller Freeman.</li><li>12. Panshin AJ, De Zeeuw C. 1980. Textbook of Wood Technology. New York (US): Mc Graw-HiJl.</li><li>13. Pizzi A. (Ed). 1983. Wood Adhesive: Chemistry and Technology. New York (US): Miracle Dekker.</li><li>14. Rydholm SA. 1965. Pulping Process. New York (US): Inierscience Publ.</li><li>15. Smook GA. 1982. Handbook for Pulp and Paper Technologists. Tappi Atlanta, Georgia &amp; Ca. Pulp Pap, Assoe. Montreal.</li><li>16. Sofyan IC, Suryana J. 1989. Hasil Hutan Non Kayu. Bogor (ID): Fakultas Kehutanan IPB.</li><li>17. Tsoumis G. 1991. Science and Technology of Wood; Structure, Properties and Technology. Van Nostrand Reinhold. USA.</li><li>18. Walker JCF. 1993. Primary Wood Processing; Principle and Practice. London (UK): Chapman &amp; Hall.</li><li>19. Wiliston M. 1978. Saws: design, selection, operation and maintenance. Miller Freman Publ.</li><li>20. Zabel RA, Morrell JJ. 1992. Wood Microbiology: Decay and Prevention. New York (US): Academic Press Inc.</li></ol>
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**TSL202 Introduction to Soil Science**

Modul designation	<b>Introduction to Soil Science</b>
Semester(s) in which the module is Taught	3 <sup>rd</sup> Semester
The person responsible for the module	Basuki Sumawinata
Lecturer	Team Teaching
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	The student having the ability to recognize the meaning of soil and land, as well as the functions, problems, and roles of soil science in agricultural development; to comprehend the processes and factors of soil formation, the characteristics and quality of soil associated with use for agriculture, and the method of land evaluation, land use planning and their management for sustainable agriculture
Content	Definition and Main Functions of Land, Soil Physical Properties, Soil Chemical Properties, Soil Fertility, Fertilizer and Fertilization, Organic Materials and Soil Organisms 1 2 Morphology and Soil Classification, Soil Surveying and Mapping, Land Resource Evaluation, Soil Conservation, Degradation and Rehabilitation, Land Use Planning, Problems and Solutions for Solving Agricultural Land in Indonesia.
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (40%), quiz (10%), herbarium (25%), and practicum examination (25%).





Reading list

1. Soepardi G. 1983. Sifat dan Ciri Tanah. Bogor (ID): Institut Pertanian Bogor.
2. Hardjowigeno S. 2003. Ilmu Tanah. Jakarta (ID): Akademika Pressindo.
3. Foth HD, Turk LM. 1972. Fundamentals of Soil Science. Fifth Edition. New York (US): John Willy & Sons.
4. Brady NC. 1990. The Nature and Properties of Soil. Tenth Edition. New York (US): Macmillan Publishing Company.
5. Singer MJ, Munns DN. 1987. Soil an Introduction. New York (US): Macmillan Publishing Company.
6. Arsyad S. 2006. Konservasi Tanah dan Air. Bogor (ID): IPB Press.
7. Haridjaja O. 2008. Pentingnya Konservasi Sumberdaya Lahan, dalam Arsyad S, Rustiadi E. 2008. Penyelamatan Tanah, Air dan Lingkungan. Jakarta (ID): Crestpent Press dan Yayasan Obor Indonesia.
8. Arsyad S, Rustiadi E. 2008. Penyelamatan Tanah, Air, dan Lingkungan. Jakarta (ID): Crestpent Press dan Yayasan Obor Indonesia



**GFM221 Climatology**

Modul designation	<b>Climatology</b>
Semester(s) in which the module is Taught	3 <sup>rd</sup> Semester
The person responsible for the module	Rini Hidayati
Lecturer	Bambang Dwi Dasanto, Akhmad Faqih, Perdinan, Idung Risdiyanti, Fithriya YR, I Putu Santikayasa, Muh. Taufik, Tania June, Impron, Handoko, Yon Sugiarto, Yonny Koesmaryono, Resti Salmayenti
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 8 times x 14 weeks = 6460 minutes = 108 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-0) sch = 4.8 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	The student having the ability to explain the elements of climate, elements of climate control, and climate formation process quantitatively and qualitatively, and to comprehend the climate distribution, variation and classification in the world
Content	Atmosphere, Solar Radiation, Air Temperature, Air Humidity, Evapotranspiration, Air Pressure, Wind, Cloud and Rain, Climate Classification, World Climate Distribution
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)
Reading list	<ol style="list-style-type: none"> <li>1. Hardy L, Wright P, Gribbin J, Kington J. 1982. The Weather Book. London (UK): Michael Joseph Ltd.</li> <li>2. Hidayati R. 1993. 1993. Klimatologi Dasar, landasan pemahaman fisika atmosfer dan unsur-unsur iklim.</li> <li>3. Trewartha GT, Lyle HH. 1980. An Introduction to Climate. Mc Graw-Hill</li> </ol>



# 4<sup>th</sup> SEMESTER



**SVK212 Forest Ecology**

Modul designation	<b>Forest Ecology</b>
Semester(s) in which the module is taught	4 <sup>th</sup> Semester
Person responsible for the module	Cecep Kusmana
Lecturer	Iwan Hilwan Yadi Setiadi Istomo Omo Rusdiana Basuki Wasis Agus Hikmat Cahyo Wibowo Rahmad Hermawan
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Dendrology
Module objectives/intended learning outcomes	Explaining Forest Ecology as a branch of ecology that studies the interrelationships between forest communities and their environment as a basis for tropical forest management.
Content	Forest ecology is one of the basic science courses in the field of forestry which describes the definition of forest ecology, the concept of tropical forest ecosystems, forests as plant communities, the relationship between plant communities and the environment, dynamics of forest communities, classification of forest vegetation, forest formations in Indonesia, how to study forest vegetation and understorey, selection of tree species, ecological approaches in critical land rehabilitation, the impact of forest disturbances and soil aspects in forest ecology.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)



Study and examination requirements	Assessment of students' achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of quiz (15%), practicum (Ethics, cooperation, conformity of procedures, punctuality, activeness) (25%), report (40%), and practicum examination (20%).
Reading list	<ol style="list-style-type: none"><li>1. Barnes BV, Zak DR, Denton SR, Spurr SH. 1998. <i>Forest Ecology</i>. John Wiley &amp; Sons Inc. New York.</li><li>2. Cox GW. 1972. <i>Laboratory Manual of General Ecology</i> Second Edition, WMC. Publ. Dubuque Iowa.</li><li>3. De Santo RS. 1978. <i>Concept Of Applied Ecology</i>. Springer Verlag. New York., Heidelberg, Berlin.</li><li>4. Ewusie JY. 1980. <i>Element of Tropical Ecology</i>. Heineman Educational Books Ltd. London.</li><li>5. Misra R. 1968. <i>Ecology Workbook</i>. Oxford &amp; IBU. Publ. House, New Delhi, Bombay, Calcuta.</li><li>6. Mueller – Dumbois D, Ellenberg DH. 1974. <i>Aims and Methods of Vegetation Ecology</i>. John Wiley &amp; Sons, New York.</li><li>7. Odum EP. 1971. <i>Fundamentals of Ecology</i>. 3rd ed. Saunders, Philadelphia, Pennsylvania.</li><li>8. Smith DM. 1997. <i>The Practice of Silviculture: Applied Forest Ecology</i>. John Wiley &amp; Sons Inc. New York.</li><li>9. Smith RL. 1986. <i>Elements of Ecology</i>. Harper &amp; Row, Publishers, New York.</li><li>10. Soerianegara I, Indrawan A. 2006. <i>Ekologi Hutan Indonesia</i>. Laboratorium Ekologi Hutan. Jurusan Manajemen Hutan Fakultas Kehutanan Institut Pertanian Bogor.</li><li>11. Turner IM. <i>The Ecology of Trees</i>. Cambridge University Press. New York.</li><li>12. Vickery ML. 1984. <i>Ecology of Tropical Plant</i>. John Wiley &amp; Sons. New York.</li><li>13. Whitmore TC, Burnham CP. 1984. <i>Tropical Rain Forest of the Far East</i>. Oxford University Press.</li></ol>



**SVK232 Forest Protection**

Modul designation	<b>Forest Protection</b>
Semester(s) in which the module is taught	4 <sup>th</sup> Semester
Person responsible for the module	Bambang Hero Saharjo
Lecturer	Achmad Lailan Syaufina Noor Farikhah Haneda Elis Nina Herliyana Yunik Istikorini Erianto Indra Putra Ati Dwi Nurhayati M. Alam Firmansyah Lufthi Rusniarsyah
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Contextual Learning, Cooperatif learning, Discussion
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Biology
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <li>1. Students can analyze the factors of forest disruptors, the causes of disturbances, the process of disruption, the impact of disorders, and methods of control of disturbances.</li> <li>2. Students can explain 1) the outer structure of the insect body, the development of insects, the classification of insects, the form of damage caused by insect pests to forest trees and the way of the use of insecticides, 2) the practicum tools of forest diseases, the symptoms and signs of forest diseases, the manufacture and sterilization of tree pathogen breeding media and the isolation of tree pathogens in breeding media, and 3) the process of burning forest fuel and heat transfer, the source of a forest fire, the behavior of the fire and the factors that affect it, and the disturbance of the forest.</li> </ol>



Content	This course is a forestry competency course that must be followed by students of the third semester of the Faculty of Forestry IPB. This course provides students with the knowledge to analyze forest protection efforts that include preventing and limiting forest destruction, forest areas, and forest products caused by pests, diseases, fires, and other disruptive factors (wild grazing, theft of forest products, migrating and forest encroachment). Lecture material includes factors of forest disruptors and the background of forest disturbances, the process of forest disturbance, the impact caused by forest disturbances, relationships between forest disrupting factors, and control over forest disturbances.
Examination forms	The assessment includes student presentations and group assignment reports, Essay Test, attendance and class activities
Study and examination requirements	Midterm exam 30% Final exam 30% The assignment of practice report 30% Structured assignment 10% If student attending the lectures > 80% so they can join the exam
Media employed	Text books, slides (power points), and films
Reading list	<ol style="list-style-type: none"> <li>1. Borrer DJ, Triplehorn CA, Johnson NF. 1992. Pengenalan pelajaran serangga. (Diterjemahkan oleh S. Partosoedjono dan MD Brotowidjoyo). Gadjah Mada University Press, Yogyakarta. (Bab 3).</li> <li>2. Boyce JS. 1948. Forest pathology. 3rd ed. McGraw Hill Book Co. Inc. New York.</li> <li>3. Brown AA, Davis KP. 1973. Forest fire: Control and use. McGraw Hill Book Co. Inc. New York.</li> <li>4. Chandler P, Cheney P, Thomas P, Trabaud L, Williams D. 1983. Forest fire Vol I: Forest fire behaviour and effects. John Wiley &amp; Sons. New York.</li> <li>5. Coulson R.N, Witter JA. 1984. Forest entomology: Ecology and management. John Wiley &amp; Sons New York. (Bab 2).</li> <li>6. Dharmaputra, O.S. dkk 1989. Mikologi Dasar. Institut Pertanian Bogor, Bogor. 274 hlm.</li> <li>7. DeBano LE, Neavy DG, Ffolliott PE. 1998. Fire's effects on ecosystems. John Wiley &amp; Sons, New York.</li> <li>8. Hadioetomo, R.S. 1993. Mikrobiologi Dasar dalam Praktik. PT Gramedia Pustaka Utama, Jakarta. 163 hlm</li> <li>9. Ilag LL. 1983. Learning the principles of plant pathology. NFAC-UPLB Countryside Action Program, UPLB at Los Banos College, Laguna.</li> <li>10. Haneda NF. 2008. Panduan praktikum perlindungan hutan (bagian hama hutan). Fakultas Kehutanan IPB, Bogor (Bab 1).</li> <li>11. Hawley RP, Stickel WP. 1956. Forest protection. John Wiley &amp; Sons, New York. (Bab 17).</li> <li>12. Husaeni EA, 2008. Perladangan berpindah (hand out).</li> <li>13. Husaeni EA, 2008. Penggembalaan liar (hand out).</li> </ol>



	<ol style="list-style-type: none"><li>14. Husaeni EA, 2008. Pencurian hasil hutan (hand out).</li><li>15. Husaeni EA, 2001. Hama hutan tanaman (Diktat). Fakultas Kehutanan IPB, Bogor</li><li>16. Manion PD. 1981. Tree disease concepts. Prentice-Hall Inc. Englewood Cliffs, New Jersey.</li><li>17. Suratmo FG. 1982. Ilmu perlindungan hutan. Fakultas Kehutanan IPB, Bogor. (Bab 5 dan 7).</li><li>18. Syaufina L. 2008. Kebakaran hutan dan lahan di Indonesia: Perilaku api, penyebab dan dampak kebakaran. Bayumedia Publishing, Malang.</li><li>19. Tapa Darma, IGK. Tehnik laboratorium patologi hutan. (Panduan Praktikum). Laboratorium Patologi Hutan,</li><li>20. Jurusan Manajemen Hutan, Fakultas Kehutanan IPB, Bogor</li><li>21. Syaufina L. 2008. Kebakaran hutan dan lahan di Indonesia: Perilaku api, penyebab dan dampak kebakaran. Bayumedia Publishing, Malang.</li><li>22. Saharjo BH. 2016. Pengendalian Kebakaran Hutan dan atau Lahan Indonesia. IPB Press, Bogor. 232 hal. ISBN:978-602-440-014-9</li><li>23. Sunjaya PI. 1970. Dasar-dasar ekologi serangga. Diktat, Fakultas Pertanian IPB.</li></ol>
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**SVK317 Forest Nutrition Management**

Modul designation	<b>Forest Nutrition Management</b>
Semester(s) in which module is taught	4 <sup>th</sup> Semester
Person responsible for the module	Basuki Wasis
Lecturer	Cahyo Wibowo
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain the relationship between soil, nutrition and forest (tree) growth and how to solve problems and improve degraded forest soils to increase forest land productivity
Content	This course explains the definition and limits of forest nutrition, the relationship between forest soil and forest vegetation development, the relationship between the environment and forest (tree) growth, the relationship between soil and tree growth, the relationship between nutrients and tree growth, nutrient cycles, assessment of forest nutrition, fertilization, nitrogen fixing. biological, harvesting tillage and stand regeneration, energy economics and forest nutrition management decisions and models for sustainable plantation development
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), and practicum (30%). The proportion of practicum score consists of report (40%), quiz (15%), practicum activity (15%), and practicum examination (30%).



Reading list	<ol style="list-style-type: none"><li>1. Anonimus. 1991. Kesuburan Tanah. Jakarta (ID): Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan.</li><li>2. Binkley D. 1987. Forest Nutrition Managemnent. New York (US): A Wiley-Interscience Publication</li><li>3. John Wiley &amp; Sons. Fisher RF, Binkley D. 2000. Ecology and Management of Forest Soils Third Edition. New Yorak (US): John Wiley and Sons, Inc.</li><li>4. Hardjowigeno S. 1989. Ilmu Tanah. Jakarta (ID): PT. Mediyatma Sarana Perkasa.</li><li>5. Hamzah Z. 1983. Diktat Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB.</li><li>6. Jordan CF. 1985. Nutrient Cycling in Tropical Forest Ecosystem. New York (US): John Wiley &amp; Sons.</li><li>7. Lutz HJ Chandler RF. 1965. Forest Soils. New York (US): John Wiley and Sons, Inc.</li><li>8. Manan S. 1997. Hutan Rimbawan dan Masyarakat. Bogor (ID): IPB Press.</li><li>9. Taylor CMA. 1995. Forest Fertilisation in Britain. London (UK): Forestry Commission Bulletin 95.</li><li>10. Wasis B. 1993. Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB.</li></ol>
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**SVK322 Silviculture**

Modul designation	<b>Silviculture</b>
Semester(s) in which module is taught	3 <sup>rd</sup> , 4 <sup>th</sup> , 5 <sup>th</sup> semester
Person responsible for the module	Sri Wilarso Budi
Lecturer	Iskandar Z Siregar Arum Sekar Wulandari Irdika Mansur Cahyo Wibowo Priyanto Pamoengkas Andi Sukendro
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain the process of tree growth and regeneration and the practice of establishing forest plantations, forest creation and maintenance techniques
Content	The Silviculture course is a compulsory subject which is followed by fourth semester students (department of silviculture) and five (department of forest management, department of forest product technology, and department of forest resource conservation and ecotourism) at the Faculty of Forestry, IPB. This course discusses: the meaning of silviculture, tree growth, the relationship of silviculture with other sciences, tree growth and reproduction, tree ecophysiology, nursery technology and forest development, silvicultural systems, planning for plantation forest development, nursery technology, maintenance and inventory of saplings in Indonesia. natural forest.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)



Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (50%), quiz (15%), attendance (10%), and practicum examination (25%).
Reading list	<ol style="list-style-type: none"><li>1 Anonim. 1993. Pedoman dan Petunjuk Teknis Tebang Pilih Tanam Indonesia (TPTI) Pada Hutan Alam Daratan. Departemen Kehutanan, Direktorat Jenderal Pengusahaan Hutan. Jakarta.</li><li>2 Budi, S.W. 2009. Petunjuk Praktikum Silvikultur. Laboratorium Silvikultur Fakultas Kehutanan IPB.</li><li>3 Daniels, T.W., J.A. Helms dan F.S. Baker. 1987. Prinsip-Prinsip Silvikultur. Gajah Mada University Press. Yogyakarta.</li><li>4 Departemen Kehutanan. 2003. Eksekutif Data Strategis Kehutanan. Bidang Statistik Kehutanan-Departemen Kehutanan. Jakarta</li><li>5 Departemen Kehutanan dan Perkebunan. 1999. Panduan Kehutanan Indonesia. Koperasi Karyawan Dephutbun. Jakarta</li><li>6 Dransfield, S. and E.A. Widjaja (Eds.). 1995. Bamboos. PROSEA. Bogor.</li><li>7 Evans, J. 1992. Plantation Forestry in the Tropics. Clarendon Press. Oxford.</li><li>8 Hartmann, H.T, D.E. Kester and F.T. Davies. 1990. Plant Propagation: Principles and Practices. Prentice-Hall International. New Jersey.</li><li>9 Haygreen, J.H. and Bowyer, J.L. 1989. Hasil hutan dan Ilmu Kayu, Suatu Pengantar. Gajah Mada University Press.</li><li>10 Kobayashi, S. et al. (Eds.). 2001. Rehabilitation of Degraded Tropical Forest Ecosystems. CIFOR. Jakarta</li><li>11 Kozlowski, T.T and Pallardy, S.G. 1996. Physiology of Woody Plants. Academic Press. London.</li><li>12 Lamprecht, H. 1989. Silviculture in the Tropics. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. Technical Cooperation-Federal Republic of Germany. Eschborn.</li><li>13 Prasetyo, L. et al. (Eds.) 2003. Survey on Silvicultural Techniques and Plantation Promoting Policies in Indonesia. FORDA-JICA. Bogor</li><li>14 Manan, S. 1976. Silvikultur. Proyek Pengembangan/Peningkatan Perguruan Tinggi. IPB. Bogor.</li><li>15 Matthews, J.D. 1989. Silvicultural Systems. Clarendon Press, Oxford.</li><li>16 Oliver, C.D and Larson, B.C. Forest Stand Dynamics. McGraw-Hill, Inc.</li><li>17 Princhett, W.L. 1979. Properties and Management of Forest Soils. John Wiley &amp; Sons, New York.</li></ol>



	<p>18 Schmidt, L. 2000. Guide to Handling of Tropical and Sub Tropical Forest Seed. Danida. Humlebaek, Denmark.</p> <p>19 Yasman, I. Dan W.T.M. Smits. 1988. Metoda Pembuatan Stek Dipterocarpaceae. Asosiasi Panel Kayu Indonesia. Jakarta.</p>
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**SVK213 Forest Soil Science**

Modul designation	<b>Forest Soil Science</b>
Semester(s) in which module is taught	4 <sup>th</sup> Semester
Person responsible for the module	Omo Rusdiana
Lecturer	Cahyo Wibowo
Language	Bahasa Indonesia
Relation to curriculum	Elective Course
Teaching methods	Interactive lecture, Collaborative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students are able to explain the basic concepts of soil science and apply these concepts in managing forests, by connecting them with forest management concepts.
Content	Forest Soil Science is one of the basic science courses that provides an understanding of the basic concepts of soil science and the role of soil in supporting forest growth and forest management.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)
Reading list	<ol style="list-style-type: none"> <li>1 Brady, NC. 1974. The Nature and Properties of Soils. 8<sup>th</sup> edition. Macmillan Publishing Co. Inc. London.</li> <li>2 Hardjowigeno, S. 2003. Klasifikasi Tanah dan Pedogenesis. Edisi Revisi. Penerbit Akademika Pressindo. Jakarta.</li> <li>3 Nambiar, EKS., and Brown, AG. (eds). 1982. Management of Soil, Nutrients and Water in Tropical Plantation Forests. ACIAR, CSIRO Australia, and CIFOR Indonesia. Australia.</li> <li>4 Ojakangas, RW. 1991. Introductory Geology. Schaums's Outline Series. McGraw-Hill, Inc. New York.</li> <li>5 Rowell, DL. 1994. Soil Science: Methods &amp; Applications. John Wiley &amp; Sons, Inc. New York.</li> <li>6 Soil Survey Staff. 2006. Keys to Soil Taxonomy. Tenth Edition. United States Department of Agriculture.</li> <li>7 Wilde, SA. 1958. Forest Soils: Their Properties and Relation to Silviculture. The Ronald Press Company, New York.</li> </ol>



**SVK223 Plantation Forest Silviculture**

Modul designation	<b>Plantation Forest Silviculture</b>
Semester(s) in which module is taught	4 <sup>th</sup> Semester
Person responsible for the module	Irdika Mansur
Lecturer	Andi Sukendro Cahyo Wibowo
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, contextual instruction
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Silviculture or Silvics
Module objectives/intended learning outcomes	Students are expected to be able to explain silvicultural techniques of forestry tree species that are important for various domestic and industrial purposes, both timber and non-timber producers. Students are expected to be able to explain silvicultural techniques of forestry tree species that are important for various domestic and industrial purposes, both timber and non-timber
Content	It is a major course that is managed by the Silviculture Division and taught to all students of the Faculty of Forestry of IPB who take the Silviculture major. This course discusses silvicultural techniques (starting from seed handling, nursery to harvesting) tree species for plantation forests, as pulp and paper materials, carpentry wood, plywood, luxury wood, types of swamp and mangrove forest trees, as well as other types of wood. tree species producing non-timber products. It is a major course that is managed by the Silviculture Division and taught to all students of the Faculty of Forestry of IPB who take the Silviculture major. This course discusses silvicultural techniques (starting from seed handling, nursery to harvesting) tree species for plantation forests, as pulp and paper materials, carpentry wood, plywood, luxury wood, types of swamp and mangrove forest trees, as well as other types of wood. tree species producing non-timber products.



Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (60%), quiz (10%), attendance (10%), and practicum examination (20%).
Reading list	<ol style="list-style-type: none"><li>1 Martawijaya A, Kartasujana I, Kadir K, Prawira SA. 1981. Atlas Kayu Indonesia. Jilid 1. Badan Litbang Kehutanan, Departemen Kehutanan. Jakarta</li><li>2 Martawijaya A, Kartasujana I, Mandang YI, Prawira SA, Kadir K. 1989. Atlas Kayu Indonesia. Jilid 2. Badan Litbang Kehutanan, Departemen Kehutanan. Jakarta</li><li>3 Abdurrohim S, Mandang YI, Sutisna U. 2004. Atlas Kayu Indonesia. Jilid 3. Badan Litbang Kehutanan, Departemen Kehutanan. Jakarta</li><li>4 Evans J. -----. Plantation forest in the tropics.-----</li></ol>





**MNH212 Forest Resource Inventory**

Modul designation	<b>Forest Resource Inventory</b>
Semester(s) in which the module is Taught	4 <sup>th</sup> Semester
The person responsible for the module	Budi Kuncahyo
Lecturer	Muhdin Tatang Tiryana Sri Rahaju Priyanto
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and prerequisites for joining	Statistics Analysis
Module objectives/intended learning outcomes	Students have the basic theoretical knowledge and practical skills on measurement techniques of tree dimensional and forest stands; and has a basic knowledge of random and systematic sampling technique in forest resource inventory as well as data processing procedures, as the basic science in the management of forest resources.
Content	Measurement of tree and stem dimensions, Measurement of stand dimensions, Volume table preparation, Sampling technique in forest resource inventory, Basics of potential estimate the non-timber forest
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%).



Reading list	<ol style="list-style-type: none"><li>1. Akca. 2000. Forest Inventory. Gottingen.</li><li>2. Avery TE. 1967. Forest Measurement. New York (US): McGraw Hill Book Company.</li><li>3. Bruce D, and Schumacher FX. 1950. Forest Mensuration. 3rd ed. New York (US): McGraw Hill Book Company.</li><li>4. Cochran. 1977. Sampling Techniques. John Wiley &amp; Sons.</li><li>5. DeVries. 1986. Sampling Theory for Forest Inventory. Springer. 113</li><li>6. Loestsch F, Haller KE. 1970. Forest Inventory, Volume I. Muenchen (DE): BLV Verlagsgessellschaft.</li><li>7. Loestsch F, Zohrer F, and Haller KE. 1973. Forest Inventory, Volume II. Muenchen (DE) BLV Verlagsgessellschaft.</li><li>8. Philip MS. 1994. Measuring Trees and Forest, 2nd ed. CAB International Wallingford.</li><li>9. Schreuder, Gregoire, Wood. 1996. Sampling Methods for Multiresource Forest Inventory. Wiley.</li><li>10. Shiver BD, Borders BE. 1996. Sampling Techniques for Forest Resource Inventory. New York (US): John Willey &amp; Sons, Inc.</li><li>11. Spurr SH. 1952. Forest Inventory. New York (US): The Ronald Press Company.</li><li>12. Van Laar A, Akca A. 1997. Forest Mensuration. Göttingen (DE): Cuviller Verlag</li></ol>
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**STK222 Experiment Design**

Modul designation	<b>Experiment Design</b>
Semester(s) in which the module is Taught	4 <sup>th</sup> Semester
The person responsible for the module	Made Sumertajaya
Lecturer	Utami Dyah Syafitri
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-2) sch = 4.8 ECTS
Required and prerequisites for joining	STK211 Statistical Methodology
Module objectives/intended learning outcomes	Students are able to make simple experimental designs that are effective and efficient, especially analyzing data experimental designs
Content	The experimental design course discusses standard experimental designs, especially in agriculture
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), discussion (30%).
Reading list	<ol style="list-style-type: none"> <li>1. Mattjik, A.A dan I . Sumertajaya. 2002. Perancangan Percobaan dengan Aplikasi SAS dan Minitab, Jilid 1. IPB Press. Bogor</li> <li>2. Montgomery, D.C. 2006. Design and Analysis of Experiments, 6<sup>th</sup> ed. John Wiley &amp; Sons, Inc. Singapore</li> <li>3. Steel, R.G.D., J.H. Torrie and D.A Dickey. 1997. Principles and Procedures of Statistics a Biomaterial Approach, 3<sup>rd</sup> ed. McGraw-Hill, Inc. Singapore</li> </ol>



**MNH315 Remote Sensing and GIS for Forestry**

Modul designation	<b>Remote Sensing and GIS for Forestry</b>
Semester(s) in which the module is Taught	4 <sup>th</sup> Semester
The person responsible for the module	I Nengah Surati Jaya
Lecturer	M. Buce Saleh Nining Puspaningsih
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 80 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and prerequisites for joining	-
Module objectives/intended learning outcomes	Students having the ability to use GIS technology and remote sensing and to analyze spatial data for forest resource management
Content	Introduction; Concepts of Geomatics and Remote Sensing, Scope of Geomatics and Remote Sensing in Forestry, Geometric Correction and Registration of Satellite Image, Composite Color to Vegetation and Visual Interpretation of Forest Ecosystem, Image improvement techniques and image enhancement for the detection of forest ecosystem attributes, Digital Classification of Forest Cover and Land, Detection and Monitoring with Satellite Imagery, SIG Concepts and links between the Forestry Science, Spatial data for Forestry 1 2 Spatial database for Forestry, Manipulation and Analysis of Spatial Operations, Spatial Modelling for Forest Planning, Spatial Simulation Modelling for Forest Management, Presentation of Forestry Spatial Information
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%).
Reading list	-



**FHT100 Field Forestry Practices**

Modul designation	<b>Field Forestry Practices</b>
Semester(s) in which the module is Taught	4 <sup>th</sup> , 5 <sup>th</sup> Semester
The person responsible for the module	Gunawan Santosa
Lecturer	Lecturer Team of Field Forestry Practices, Faculty of Forestry IPB
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 130 minutes x 1 time x 5 days x 650 minutes = 11 hours Practice: 240 minutes x 1 time x 30 days = 7200 minutes = 120 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Total: 8100 minutes = 135 hours
Credit points	3 sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Students have completed the subjects: Introduction to Forestry Science and Environmental Ethic, Forest Resource Inventory, Forest Ecology, Bio-Resources Conservation and completed lectures at least 60 credits
Module objectives/intended learning outcomes	Students are able to identify ecosystem types and its components, interaction, process, roles, and function of each ecosystem type in Indonesia from the beach to mountain area; able to identify and estimate the parameter of ecosystem components from beach to mountain area; able to analyze the concept and theory by depth exploring the implementation theory of forest management unit (Perum Perhutani, Conservation Area, Industry of timber/non timber, community), as well as developing technical ability. Besides that, students are able to develop personality, teamwork ability, work ethic, and professional ethics
Content	Forest classification and types, Physical environmental factors of the forest, Technical observation of wildlife, Forest planning, Forest development, Forest protection, Harvesting of non-timber forest product, Bio-resources conservation, Social forestry, Industry of forest product
Examination forms	Quiz in Preparation Stage 1 week before departing to the field 15%, Implementation of Field Practice Everyday in 24 days 30%, Practical Report Everyday in 24 days 40%, Quiz of Practical Material Minimal 1 time 15%



Study and examination requirements	Students are able to demonstrate interview and social interaction in forest community, Students are able to demonstrate forest planning activities, Students are able to observe wildlife, Students are able to estimate the parameter of ecosystem components from beach to mountain area and its potency, students are able to develop personality, teamwork ability, work ethic, and professional ethics
Reading list	Fakultas Kehutanan. 2019. Panduan Praktik Lapangan Kehutanan Mahasiswa Proram Sarjana. Bogor: IPB



# 5<sup>th</sup> SEMESTER



**SVK313 Forest Syn-ecology**

Modul designation	<b>Forest Syn-ecology</b>
Semester(s) in which module is taught	5 <sup>th</sup> Semester
Person responsible for the module	Cecep Kusmana
Lecturer	Istomo
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Interactive Lecture, Collaborative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	Forest Ecology
Module objectives/intended learning outcomes	Able to explain various types of forest ecosystems from coastal forest, mangrove forest, seagrass and coral reefs, swamp forest, peat swamp forest, monsoon forest, savanna, heath, limestone forest, lowland forest and mountain forest for sustainable forest management
Content	This course will provide students with competence to explain various types of forest ecosystems from coastal forests, mangrove forests, seagrass beds and coral reefs, swamp forests, peat swamp forests, monsoon forests, savanna, heath, limestone forests, lowland forests and mountain forests.
Examination forms	Lecture examination (writing test in the midterm and final semester)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)
Reading list	<ol style="list-style-type: none"> <li>1 Anwar, J., S.J. Damanik, N. Hisyam, A.J Whitten.1984. The Ecology of Sumatra. Gadjah Mada University Press.</li> <li>2 MacKinnon, K., G. Hatta, H. Halim, A. Mangalik. 1996. The Ecology of Kalimantan. Periplus Edition (HK) Ltd.</li> <li>3 Monk, KA., YD Fretes, G. Reksodihardjo. 1997. The Ecology of Nusa Tenggara and Maluku. Periplus Edition (HK) Ltd.</li> <li>4 Nirarita, CH, P Wibowo, S. Susanti, D. Padmawinata, Kusmarini, M, Syarif, Y. Hendriani, Kusniangsih, L.Sinulingga. 1996. Ekosistem Lahan Basah Indonesia (Buku Panduan untuk Guru dan Praktisi Pendidikan). Wetlands Internasional Indonesia Programme.</li> <li>5 Whitmore, TC, C.P Burnham. 1984. Tropical Rain Forest of the Far East. Oxford University Press.</li> </ol>





	<p>6 Whitten, A.J., M. Mustafa, G.S. Henderson. 1987. The Ecology of Sulawesi. Gadjah mada University Press.</p> <p>7 Whitten, J. RE Soeriatmaja, SA Afiff.1996. Ecology of Jawa and Bali. Periplus Edition (HK) Ltd.</p>
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**SVK315 Forest Influence**

Modul designation	<b>Forest Influence</b>
Semester(s) in which module is taught	5 <sup>th</sup> Semester
Person responsible for the module	Omo Rusdiana
Lecturer	Lailan Syaufina
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain processes of land formation and degradation, principles of erosion and runoff control, measurement and estimation of erosion and runoff and best practices of forest land management.
Content	This course is a major course in the Silviculture Department which discusses: watersheds; climate classification; carbon balance, forest management practices in relation to erosion and other environmental services; soil and water conservation principles; bioengineering; soil and carbon conservation planning.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), and practicum (30%). The proportion of practicum score consists of report (30%), quiz (10%), project (30%), and practicum examination (30%).
Reading list	1 Binkley, D. 1987. Forest Nutrition Management. A Wiley- Interscience Publication John Wiley & Sons. New York. 2 Borman, F.H., and Likens, G.F. 1979. Patterns and progress in a Forested Ecosystem. Springer-Verlag, New York. 3 Brooks, P.F. Ffolliott, H.M. Gregersen, L.F. DeBano. 2003. Hydrology and the Management of Watersheds. 3rd Edition.



	K.N. Iowa State Press.
4	Bruijnzeel, L.A. 1990. Hydrology of Moist Tropical Forest and Effects of Conversion: a State of Knowledge Review. Free University of Amsterdam. The Netherlands.
5	Bruce, J.P. and Clark, R.H. 1977. Introduction to Hydrometeorology. Pergamon Press. Oxford.
6	Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan. 1991. Kesuburan Tanah. Jakarta.
7	Fisher, R. F., and D. Binkley. 2000. Ecology and Management of Forest Soils. Third Edition John Wiley and Sons, Inc. New York. 489 p.
8	Hamilton, L.S. and King P.N., 1993. Tropical Forested Watersheds, Hydrological and Soils Response to Major Uses of Conversions. Westview Press Inc., Boulder, Colorado. Edisi Bahasa Indonesia. Penerjemah: Suryanata, K. (Ed):
9	Tjitrosoepomo, G., 1997. Daerah Aliran Sungai Hutan Tropika, Tanggapan Hidrologi dan Tanah Terhadap Penggunaan atau Konservasi. Gadjah Mada University Press.
10	Landsberg, J.J., and Gower, S.T. 1997. Application of Physiological Ecology to Forest Management. Academic Press. San Diego, California.
11	Jordan C. F. 1985. Nutrient Cycling in Tropical Forest Ecosystem. John Wiley & Sons. New York.
12	Lee, R., 1980. Forest Hydrology. Columbia university Press. N.Y. Edisi Bahasa Indonesia. Penerjemah : Subagio, S.1988. Hidrologi Hutan. Gadjah Mada University Press.
13	Lutz H. J. and R. F. Chandler. 1965. Forest Soils. John Wiley and Sons, Inc. New York. 514 p.
14	Schwab et al., 1986. Soil and Conservation Engineering. Staf Jurusan Geomet IPB. 1982. Klimatologi Dasar. Jurusan Geomet IPB.
15	Susilo P. 2000. Meteorologi. ITB Bandung.
16	Taylor, C. M. A. 1995. Forest Fertilisation in Britain. Forestry Commission Bulletin 95. London. 34 p
17	Viessman, W.Jr., Lewis, G.L., and Knapp, J.W. 1989. Introduction to Hydrology. Harper & Row Publishers, Inc.



**SVK323 Forest Genetics**

Modul designation	<b>Forest Genetics</b>
Semester(s) in which module is taught	5 <sup>th</sup> Semester
Person responsible for the module	Ulfah Juniarti
Lecturer	Iskandar Z. Siregar
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain genetic principles, conduct genetic analysis and apply genetic aspects in forest development activities. Able to apply experiments and genetic analysis, both Mendelian and modern, as well as apply genetic aspects in forest development, and tree breeding
Content	Courses taught by the Silviculture Division and taught to students of the Silviculture Major Undergraduate Program, Faculty of Forestry, IPB. This course discusses the principles and general genetic analysis, tropical forest plant genetic systems, sexual systems, mating systems, gene flow, the basis of modern genetics and its methods, the evolutionary process of tropical forest plants, the application of genetic principles to forestry programs, such as conservation of genetic resources. forestry and tree breeding, mating systems and methods for estimating the degree of selfing/crossing, modern genetics and methods, determining gene frequency, genotypes in Hardy-Weinberg equilibrium, evolutionary processes, adaptation, effects of selection, migration, mutation and genetic drift, and calculate heritability.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)



Study and examination requirements	Assessment of students' achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (50%), quiz (15%), attendance (10%), and practicum examination (25%).
Reading list	<ol style="list-style-type: none"><li>1 Avers, C.J. 1984. Genetics. Willard Grant Press. 644pp.</li><li>2 Falconer, D.S. and T.F.C. Mackay. 1996. Introduction to Quantitative Genetics. Fourth Edition. Longman. 464pp.</li><li>3 Finkeldey, R. 2004. An Introduction to Tropical Forest Genetics. Inst. Forest Genet. Tree Breed. Georg-August Univ. Gottingen.</li><li>4 Griffiths, A.J., J.H. Miller, D.T. Suzuki, R.C. Lewontin, and W.M. Gelbart. 1999. An Introduction to Genetic Analysis. W.H. Freeman. 860pp.</li><li>5 Hartl, D.L. and A.G. Andrew. Principles of Population Genetics. Second Edition. Sinauer Assoc. Inc. 682pp.</li><li>6 Wright, J.W. 1976. Introduction to Forest Genetics. Academic Press, New York. 463pp.</li></ol>



**SVK332 Forest Pest Science**

Modul name	<b>Forest Pest Science</b>
Semester(s) in which module is taught	5 <sup>th</sup> Semester
Person responsible for the module	Noor Farikhah Haneda
Lecturer	Lufthi Rusniarsyah
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, cooperative learning, contextual instruction
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Forest Protection
Module objectives/intended learning outcomes	1. Students are able to conclude forest pest problems in the field and their control based on bio-ecosystems 2. Students are able to manage forest pest attacks in the field based on the tactics and strategies used
Content	Forest pests are part of silviculture which studies the animals that cause damage to trees and forest stands. This course will discuss animals that cause damage to trees and forest stands, especially insects, the role of insects in forest ecosystems, insect characteristics, insect features, insect behavior, life cycle, reproductive power, reproduction, insect classification and metamorphosis; forest plants and how forest plants are targeted by insects, the influence of the physical and biotic environment on insect life (population ecology); calculation of the economic threshold, whether or not pest problems arise, the consequences and impacts of pest attacks on trees and forest stands; methods of surveying and monitoring forest pests; and ecosystem-based control methods
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (30%), final exam (30%), practicum (40%). The proportion of practicum score consists of report, quiz, Structured assignment, and practicum examination



Media employed	Text books, slides (power points), and films
Reading list	<ol style="list-style-type: none"><li>1 Borror, DJ, CA Triplehorn &amp; NF Johson. 1996. Pengenalan Serangga. UGM Press, Yogyakarta</li><li>2 Coulson, RN &amp; JA Witter. 1984. Forest Entomology., Ecology and Management. John Willy&amp;Son, New York</li><li>3 Finney, D.J. 1962. Probit Analysis. Cambridge University Press.</li><li>4 Husaeni EA, Kasno, Haneda NF, Oemijati R. 2006. Pengantar Hama Hutan di Indonesia: Bio-ekology dan Teknik Pengendalian. Departemen Silvikultur, Fakultas Kehutanan, IPB.</li><li>5 Kalshoven, LGE. 1983. The Pests of Crops in Indonesia. PT Ichtiar Baru, Jakarta.</li><li>6 Matthews, GA. 1979. Pesticide Applications Methods.</li><li>7 Pedigo, LP. 2002. Entomology and Pest Management. Precentice Hall. New Jersey.</li><li>8 Wadley, FM. 1967. Experimental Statistics in Entomology.</li></ol>



**SVK326 Forest Seed Technology**

Modul designation	<b>Forest Seed Technology</b>
Semester(s) in which module is taught	5 <sup>th</sup> semester
Person responsible for the module	Supriyanto
Lecturer	Andi Sukendro Arum Sekar Wulandari
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Silviculture
Module objectives/intended learning outcomes	Able to explain the importance of seed technology for generative propagation of forest plants and producing quality (generative) forest plant seeds in order to support sustainable forest development.
Content	This course discusses the technology for generative (sexual) forest plant propagation, starting from the meaning and purpose of seed technology, seed quality, seed problems in Indonesia; biology, development and ecology of seeds; downloading, collecting and harvesting seeds; extraction, cleaning and selection of seeds; seed storage; seed transportation, dormancy and pretreatment; seed testing; and a national seed system in order to support sustainable forest development.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students' achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (50%), quiz (15%), attendance (10%), and practicum examination (25%).
Reading list	1. Bonner FT, Karrfalt RP, editor. 2008. <i>The Woody Plant Seed Manual</i> . USA: U.S. Department of Agriculture, Forest Service.





	<ol style="list-style-type: none"><li>2 Gordon AG. 1992. <i>Seed Manual for Forest Trees</i>. Britain: H.M. Stationery Office.</li><li>3 Schmidt L. 2000. <i>Guide to Handling of Tropical and Subtropical Forest Seed</i>. Denmark: Danida Forest Seed Center. Publikasi Perbenihan Tanaman Hutan Tropika Indonesia.</li><li>4 Sudrajat DJ, Nurhasybi, Bramasto Y. 2015. <i>Standar Pengujian dan Mutu Benih Tanaman Hutan</i>. Bogor: Forda Press.</li></ol>
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**SVK318 Basics of Post-Mining Land Reclamation and Forest Restoration**

Modul designation	<b>Basic of Post-Mining Land Reclamation and Forest Restoration</b>
Semester(s) in which the module is taught	5 <sup>th</sup> semester
Person responsible for the module	Basuki Wasis
Lecturer	Irdika Mansur Bayu Winata
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (2-3) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Biology, Chemistry, Physics, Forest Nutrition Management
Module objectives/intended learning outcomes	Able to analyze post mining land reclamation and forest restoration, mine soil improvement and management, fertilization, bioremediation, analysis of forest growth (trees) and how to solve problems and improve degraded post-mining land to increase post-mining land productivity and sustainable forest and environmental management.
Content	This course explains the meaning and limitations of Post-Mining Land Reclamation and Forest Restoration, Mining's impact on environmental damage, Mining's impact on environmental pollution, Mining's impact on soil and physical properties of forest soil, Mining's impact on chemical properties of forest soil, Mining's impact on biological properties of forest soil, erosion and technology conservation of soil and water in mining land, restoration of forest and post-mining land, regulation of surface soil in mine land, source of mining land filling material, technical design and procedures for land management, bioremediation, revegetation, evaluation of success of mine land rehabilitation and forest restoration for post-mining land management and sustainable forest development.



Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), and practicum (30%). The proportion of practicum score consists of report (40%), quiz (15%), practicum activity (15%), and practicum examination (30%).
Reading list	<ol style="list-style-type: none"><li>1 Hand Out Mata Kuliah Dasar-Dasar Reklamasi Lahan Pasca Tambang dan Restorasi Hutan</li><li>2 UU No 4 tahun 2009 tentang pertambangan mineral dan batubara</li><li>3 Munir M. 1995. Geologi dan Mineralogi Tanah. Pustaka Jaya. Jakarta</li><li>4 Cornnell DW. dan Miller GJ. 1995. Kimia dan Ekotosikologi Pencemaran. Penerbit UI, Jakarta</li><li>5 Notodarmojo S. 2005. Pencemaran Tanah dan Air Tanah Penerbit ITB Bandung</li><li>6 Arsyad S. 2006. Konservasi Tanah dan Air. IPB Press. Bogor.</li><li>7 Jordan C. F. 1985. Nutrient Cycling in Tropical Forest Ecosystem. John Wiley &amp; Sons. New York.</li><li>8 Hardjowigeno, S. 1986. Ilmu Tanah. Akademi Pressindo. Jakarta</li><li>9 Lutz H. J. and R. F. Chandler. 1965. Forest Soils. John Wiley and Sons, Inc. New York. 514 p.</li><li>10 Anonimous. 1991. Kesuburan Tanah. Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan. Jakarta.</li></ol>



**SVK312 Growth Site Quality**

Modul designation	<b>Growth Site Quality</b>
Semester(s) in which module is taught	5 <sup>th</sup> semester
Person responsible for the module	Basuki Wasis
Lecturer	Cahyo Wibowo
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Interactive Lecture, Collaborative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain growth site quality, the factors that affect the growth site quality, the relationship between soil, climate and the environment, as well as how to solve problems and improve degraded forest land to increase the productivity of forest land.
Content	This course explains the definition and limitations of the growth site quality, the factors that affect the growth site quality, the elements of the growth site quality, the assessment of the growth site quality, the growth site quality and the productivity of the forest, soil factors: ground water, soil physics, soil chemistry, biology. soil, soil acidity, climatic factors: soil temperature, weather elements, damage to the quality of the growing place and the environment, pollution of the quality of the growing place and the environment and the productivity of the forest and the growth site quality.
Examination forms	Lecture examination (writing test in the midterm and final semester)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)
Reading list	1 Anonimous. 1991. Kesuburan Tanah. Jakarta (ID): Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan. 2 Binkley D. 1987. Forest Nutrition Managemnt. New York (US): A Wiley-Interscience Publication John Wiley & Sons. 3 Fisher RF, Binkley D. 2000. Ecology and Management of Forest Soils Third Edition. (New York (US): John Wiley and Sons.



	<ol style="list-style-type: none"><li>4 Hardjowigeno S. 1989. Ilmu Tanah. Jakarta (ID): PT. Mediyatma Sarana Perkasa. Jakarta.</li><li>5 Hamzah Z. 1983. Diktat Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB.</li><li>6 Jordan C F. 1985. Nutrient Cycling in Tropical Forest Ecosystem. New York (US): John Wiley &amp; Sons.</li><li>7 Lutz HJ, Chandler RF. 1965. Forest Soils. New York (US): John Wiley and Sons, Inc.</li><li>8 Manan S. 1997. Hutan Rimbawan dan Masyarakat. Bogor (ID): IPB Press.</li><li>9 Taylor CMA. 1995. Forest Fertilisation in Britain. London (UK): Forestry Commission Bulletin 95.</li><li>10 Wasis B. 1993. Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB.</li><li>11 Wasis B. 2006. Perbandingan kualitas tempat tumbuh antara daur pertama dengan daur kedua pada hutan tanaman <i>Acacia mangium</i> Willd. (studi kasus di HTI PT. Musi Hutan Persada, Provinsi Sumatera Selatan) [Disertasi]. Bogor (ID): Sekolah PascasarjanaIPB.</li></ol>
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**MNH331 Forest Harvesting**

Modul designation	<b>Forest Harvesting</b>
Semester(s) in which the module is Taught	6 <sup>th</sup> Semester
The person responsible for the module	Juang R. Matangaran
Lecturer	Juang R. Matangaran Elias Gunawan Santosa Ahmad Budiaman Ujang Suwarna Efi Y Yovi
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Lecture (face-to-face lecture)
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 8 times x 14 weeks = 6460 minutes = 108 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-0) sch = 4.8 ECTS
Required and prerequisites for joining the	-
Module objectives/intended 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.
Content	1. Explanation of rules and lecture courses agreement 2. Limitation of forest harvesting and development of forest harvesting history 3. Linkage between forest harvesting and other science 4. The stages of harvesting planning



	<ol style="list-style-type: none"><li>5. The stages of felling/logging and bucking policy</li><li>6. The stages of skidding and hauling</li><li>7. Forest harvesting systems</li><li>8. Basic consideration of harvesting system selection</li><li>9. Principle of area fall determination (tree felling)</li><li>10. Making notch fall and notch reply</li><li>11. Trunk division technique</li><li>12. Consideration of skidding system selection</li><li>13. Wood skidding techniques</li><li>14. Log Landing Site (TPn), log concentration yard/ logpond (TPK)</li><li>15. Modes of wood hauling</li><li>16. Timber loading technique</li><li>17. Rafting technique, dimensional raft and river requirement</li><li>18. Basic principle and the purpose of timber measurement</li><li>19. Measurement of timber dimensions and timber spilasi</li><li>20. Identify timber defects and timber testing • Determination of timber quality</li><li>21. Work element</li><li>22. Basic principles of worktime measurement</li><li>23. Classification of working time</li><li>24. Classification of work product measurement</li><li>25. Work productivity measurement</li><li>26. Purpose forest clearing</li><li>27. Types and functions forest road</li><li>28. Trace and road density</li><li>29. Power capacity and quality road</li><li>30. Characteristic of teak forest</li><li>31. Systems and organizational structure of the teak forest harvesting</li><li>32. Timber administrations</li><li>33. Definition of non-timber forest products</li><li>34. Classification of non-timber forest products</li><li>35. Harvesting technique of non-timber forest products</li><li>36. Power plant, power train dan attachment</li><li>37. The type, performance tool and felling machine, skidding machine, loading machine and wood unloading machine in the natural forest industrial forest</li></ol>
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	<ul style="list-style-type: none"><li>38. Calculation of capacity and the number of machines</li><li>39. The importance of work safety in timber harvesting</li><li>40. The rules of occupational health and safety management</li><li>41. Work accident management</li><li>42. Forest harvesting of conventional techniques</li><li>43. Forest harvesting and reduce impact logging technique</li><li>44. Managing the impact of forest harvesting</li></ul>
Examination forms	Lecture examination (writing test in the midterm and final semester).
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)
Reading list	<ul style="list-style-type: none"><li>1. Brown A. 1969. Logging. New York (US): John Wiley and Sons.</li><li>2. Conway, S. 1982. Logging Practices. Principles of Timber Harvesting Systems. San Fransisco (US): Muller Freeman Publication Inc.</li><li>3. DepHut RI, 1998. Sejarah Kehutanan Indonesia. Jakarta (ID); Dephut.</li><li>4. Elias, Applegate G, Kartawinata K, Machfudh, Klasesn A. 2001. Pedoman Reduced Impact Logging Indonesia. Bogor: CIFOR, Dephut, ITTO</li><li>5. Soeparto RS. 1978. Eksploitasi Hutan Modern. Bogor (ID): Fakultas Kehutanan IPB</li><li>6. United Tractor. 1984. Manajemen Alat-Alat Besar (Teknik Dasar Pemilihan, Pemakaian dan Pengelolaan Alat-alat Besar). Jakarta (ID): PT United Tractors.</li></ul>





# 6<sup>th</sup> SEMESTER



**SVK314 Tropical Forest Spesies Ecology**

Modul designation	<b>Tropical Forest Spesies Ecology</b>
Semester(s) in which module is taught	6 <sup>th</sup> Semester
Person responsible for the module	Istomo
Lecturer	Iwan Hilwan
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Theory, collaborative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	Forest Ecology
Module objectives/intended learning outcomes	Able to explain about plant geography, process of adaptation and study of autoecology of species, ecology of tropical tree species (Dipterocarpaceae, non-Dipterocarpaceae) ecology of lesser known tropical tree species and trees for non-timber forest product purposes
Content	Tropical Tree Ecology is a course that contains the potential, distribution and behavior of tropical tree species in relation to the characteristics of the place where they grow and understands the process of adaptation, domestication and their cultivation efforts to increase land and forest productivity.
Examination forms	Lecture examination (writing test in the midterm and final semester)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%)
Reading list	1 Vickery, M.L. 1984. Ecology of Tropical plants. John Wiley & Sons. Chicester-New York-Brisbane-Toronto-Singapore. 2 Misra, K.C. 1974. Manual of Plant Ecology. Oxford & IBH Publising Co. New Delhi-Bombay-Calcutta. 3 Polunin, N. 1960. Pengantar Geografi Tumbuhan dan beberapa Ilmu Serumpun (Introduction to Plant Geography and Some Related Sciences). Terjemahan oleh: G. Tjitrosoepomo. Gadjah Mada University Press. 4 Shukla, R.S. and P.S. Chandel. 1982. Plant Ecology and Soil Science. S. Chand & Company LTH. Ramnagar, New Delhi 5 Kimmins, J.P. Forest Ecology. 1987. Macmillan Publising Company New York.



- 6 Sitompul, S.M and B. Guritno. 1995. Analisis Pertumbuhan Tanaman. Gadjah Mada University Press.
- 7 Garder, F. P., R. B. Pearce. R. L. Mitchell. 1985. Fisiologi Tanaman Budidaya (Physiology of Crop Plants). Terjemahan oleh H. Susilo dan Subiyanto (1991). UI-Press.
- 8 Appanah, S. And J. M. Turnbull (Editors). 1998. A Riview of Dipterocarpars : Taxonomy, Ecology and Silviculture. CIFOR.
- 9 Hensleigh, T.E and B.K. Holaway (editors). 1988. Agroforestry Species for the Philippines. Funded By U.S. Peace Corps. Washington D.C.
- 10 Roshetko, J.M. and D.O. Evans (Editors). 1999. Domestication of Agroforestry Trees in Southeast Asia. Proceedings of a Regional Workshop. A publication of Winrock International in collaboration with ICRAF.
- 11 Soerianegara, I and R.H.M.J. Lemmens (Editors). 1994. Plant Resources of South-East Asia, 5 (1) Timber Trees : Major Comercial Timbers. Pudoc-DLO, Wageningen, The Netherlands.
- 12 Lemmens, R.H.M.J., I Soerinegara dan W.C. Wong (Editors). 1996. Plant Resources of South – East Asia 5 (2) Timber Trees: Minor Comercial Timbers. Prosea Foundation, Bogor.
- 13 Verheij, E. W. M. And R.E. Corone (Editors). 1992. Plant Resources of South-East Asia 2: Edible Fruits and Nuts. Prosea, Bogor.
- 14 Lemmens, R.H.M.J. and N. Wulijarni-Soetjipto (Editors). 1992. Plant Resources of South-East Asia 3: Dye and Tannin Producing Plants. Prosea, Bogor.
- 15 Sosef, M.S.M., L.T. Hong and S. Prawirohatmodjo (eds.). 1998. Plant Resources of South-East Asia. No 5 (3) Timber trees: Lesser-known timbers. Backhuys Publishers. Leiden.



**SVK324 Tree Improvement**

Modul designation	<b>Tree Improvement</b>
Semester(s) in which module is taught	6 <sup>th</sup> semester
Person responsible for the module	Iskandar Z. Siregar
Lecturer	Ulfah Juniarti Siregar
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Forest Genetics
Module objectives/intended learning outcomes	Able to explain in detail tree breeding activities and their role in producing genetically superior seeds. Able to practice or demonstrate tree breeding activities and be able to present the results of literature studies and practicum results
Content	Tree breeding is the application of genetic principles to forest development to obtain trees with higher traits and yields. This course discusses the background, objectives and scope of tree breeding, diversity and its causal factors, provenance testing, selection, progeny testing, estimation of population parameters, tree propagation, development and management of seed sources, tree breeding programs and the development of tree breeding in Indonesia. Tree breeding practicum materials include literature and practice on population diversity, provenance testing, selection, progeny testing, estimation of population parameters, appointment of seed stands and tree breeding programs.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (50%), quiz (15%), attendance (10%), and practicum examination (25%).



Reading list

4. Burley, J and B.T. Styles. 1976. Tropical Trees, Variation, Breeding and Conservation. Commonwealth Forestry Institute Academic Press, New York.
5. Burley, J and P.J. Wood. 1976. A Manual on Species and Provenance Research with Particular Reference to the Tropics. Departemen of Forestry, C F I. University of Oxford, Oxford, England.
6. Departemen Kehutanan. 2002. Petunjuk Teknis Identifikasi dan Deskripsi Sumber Benih. Direktorat Perbenihan Tanaman Hutan, Direktur Jenderal Rehabilitasi Lahan dan Perhutanan Sosial, Departemen Kehutanan.
7. Djamhuri, E. 2009. Seleksi Pohon Plus. Bagian Silvikultur, Departemen Silvikultur Fakultas Kehutanan IPB.
8. Falconer, D.S. 1960. Introduction to Quantitative Genetics, Ronald Press, New York.
9. Anonim. 1975. Seed Orchards. Forestry Commission Bulletin No. 54. Her Majesty's Stationary Office, London.
10. Finkeldey, R. 1998. An Introduction to Tropical Forest Genetics. Institute of Forest Genetics and Forest Tree Breeding. Georg-August-University Gottingen, Germany.
11. Francis CY, Boyle T, Rongcai Y, Ye Z, Xiyan JM. 1999. Popgene version 1.31 quick user guide. Canada (EU): University of Alberta.
12. Kumar S, Dudley J, Nei M, Tamura K. 2008. MEGA: A biologist-centric software for evolutionary analysis of DNA and protein sequences. Amerika Serikat (US): Center of Evolutionary Functional Genomics Biodesign Institute and Arizona State University.
13. Hartmann, H.T and D.E. Kester. 1983. Plant Propagation Principles and Practice. Fourth Edition. Prentice-Hall, Inc. Englewood Cliffs, New Jersey.
14. Namkoong, G. 1979. Introduction to Quantitative Genetics in Forestry. Technical Bulletin No. 1588. U.S Forest Services, Washington, DC.
15. Laporan-laporan hasil uji provenansi di Indonesia
16. Nasoetion, A.H dan Barizi. 1979. Metode Statistika untuk Penarikan Kesimpulan. PT Gramedia, Jakarta.
17. Schmidt, L. 1993 a. Seed Stands Guidelines on Establishment and Management Practices. RAS/91/004. Field Manual No. 3.
18. Anonim. 1993 b. Seed Orchards Guidelines on Establishment and Management Practices. RAS/91/004. Field Manual No. 4. Los Banos, Philipines : UNDP/FAO Forest Tree Improvement Project.
19. Soerianegara, I dan E. Djamhuri, 1979. Pemuliaan Pohon Hutan. Departemen Manajemen Hutan, Fakultas Kehutanan IPB.
20. Publikasi dan laporan pembangunan kebun benih
21. Publikasi dan laporan program pemuliaan pohon di Indonesia
22. Rohlf FJ. 1998. NTSYSpc Numerical Taxonomy and Multivariate Analysis System Version 2.0 User Guide. New York (US): Computer Program Library, State University of New York at Stony Brook.



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|  | <ol style="list-style-type: none"><li>23. Steel, R.G.D and J.H. Torrie. 1981. Principles and Procedure of Statistics. A Biometrical Approach. Second Edition.</li><li>24. International Student Edition. Mc Graw-Hill. International Book Company, Sydney, Tokyo.</li><li>25. Soerianegara, I dan E. Djamhuri, 1979. Pemuliaan Pohon Hutan. Departemen Manajemen Hutan, Fakultas Kehutanan IPB.</li><li>26. Tamura K, Dudley J, Nei M, Kumar S. 2007. MEGA Molecular Evolutionary Genetics Analysis Version 4. Amerika Serikat (US): Center of Evolutionary Functional Genomics Biodesign Institute and Arizona State University.</li><li>27. Williams, E.R; A.C. Matheson and C.E. Harwood. 2002. Experimental Design and Analysis for Tree Improvement. Second Edition. CSIRO Publishing, Australia.</li><li>28. Zobel, B.J and T.T Talbert. 1984. Applied Forest Tree Improvement. John Wiley and Sons, New York.</li></ol> |
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**SVK325 Forest Tree Propagation Technology**

Modul designation	<b>Forest Tree Propagation Technology</b>
Semester(s) in which module is taught	6 <sup>th</sup> semester
Person responsible for the module	Arum Sekar Wulandari
Lecturer	Andi Sukendro
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Able to explain the importance of vegetative propagation of forest plants and producing quality forest plant seeds (vegetatively) in order to support sustainable forest development.
Content	This course discusses the technology for vegetative (asexual) propagation of forest plants, which consists of: cuttings, grafting, grafting, grafting and plant tissue culture; the role and problems of vegetative
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (50%), quiz (15%), attendance (10%), and practicum examination (25%).
Reading list	1 Ahmad DH, Hamzah AP. 1993. <i>Vegetative Propagation of Tropical Tree Species by Stem Cuttings</i> . USA: F/FRED Project Management Office 2 Fretz TA, Read PE, Peele MC. 1979. <i>Plant Propagation Lab Manual</i> . USA: Burgess. 3 Hartmann HT, Kester DE, Davies FT, Geneve RL. 1997. <i>Plant Propagation: Principles and Practices</i> . USA: Prentice-Hall Inc. 4 Jain SM, Gupta PK, Newton RJ. 2013. <i>Somatic Embryogenesis in Woody Plants</i> . USA: Springer.



- 5 Jaenicke H, Beniast J. 2002. *Vegetative Tree Propagation in Agroforestry: Training Guidelines and References*. Kenya: ICRAF Kul Graphics Ltd.
- 6 Lewis WJ, Alexander DM. 1979. *Grafting and Budding: a Practical Guide for Fruit and Nut Plants and Ornamentals*. 2<sup>nd</sup> ed. Australia: Landlinks Press.
- 7 Longman KA. 1993. Rooting Cuttings of Tropical Trees. *Tropical Trees: Propagation and Planting Manuals Volume* London: Commonwealth Science Council.
- 8 Razdan MK. 2003. *Introduction to Plant Tissue Culture*. 2<sup>nd</sup> ed. India: Science Publishers, Inc.
- 9 Pierik RLM. 1997. *In Vitro Culture of Higher Plants*. Dordrecht: Kluwer Acad. Publ.
- 10 Saad AIM, Elshahed AM. 2012. Recent Advances in Plant in vitro Culture: Plant Tissue Culture Media. <http://dx.doi.org/10.5772/50569>.
- 11 Smith RH. 2013. *Plant Tissue Culture: Techniques and Experiments*. 3rd Ed. New York: Academic Press.
- 12 Thorpe TA, Harry IS, Kumar PP. 1991. Application of micropropagation to forestry. Di dalam: Debergh PC, Zimmerman RH, editor. *Micropropagation: Technology and Application*. USA: Springer. hlm 311-336.
- 13 Yasman I, Smith WTM. 1988. *Metode Pembuatan Stek Dipterocarpaceae*. Jakarta: APhi.
- 14 Video: How to prepare tissue culture media Part1. [https://youtu.be/RwkIk-s1e\\_o](https://youtu.be/RwkIk-s1e_o)
- 15 Video: Preparing Tissue Culture Media. <https://youtu.be/8OrFf6hnyfY>
- 16 Video: Plant tissue culture basics. <https://youtu.be/bi755vQVNx8>
- 17 Video: Introduction to the Tissue Culture Lab. <https://www.youtube.com/watch?v=siEfHSSiGgg>





**SVK333 Forest Pathology**

Modul designation	<b>Forest Pathology</b>
Semester(s) in which module is taught	6 <sup>th</sup> Semester
Person responsible for the module	Elis Nina Herliyana
Lecturer	Achmad Yunik Istikorini M. Alam Firmansyah
Language	Bahasa Indonesia
Relation to curriculum	Compulsory Course
Teaching methods	Contextual Learning, Cooperatif learning, Discussion
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Biology, Forest Protection
Module objectives/intended learning outcomes	Students are able to explain about the concepts, mechanisms, types, biology, ecology and disease control of forest plants
Content	This course provides knowledge to students to be able to explain the meaning and scope of forest diseases, disease physiology, mechanisms of attack by pathogens, mechanical host defense, disease ecology, seed disease, seed disease, root disease, stem disease, leaf disease, wood weathering, wood staining, forecasting and disease assessment and disease control in forest plants. This course provides knowledge to students to be able to explain the meaning and scope of forest diseases, disease physiology, mechanisms of attack by pathogens, mechanical host defense, disease ecology, seed disease, seed disease, root disease, stem disease, leaf disease, wood weathering, wood staining, forecasting and disease assessment and disease control in forest plants.
Examination forms	The assessment includes student presentations and group assignment reports, Essay Test, attendance and class activities
Study and examination requirements	Midterm exam 30% Final exam 30% The assignment of practice report 30% Structured assignment 10% If student attending the lectures >80% so they can join the exam



Media employed	Textbooks, slides (power points), and films
Reading list	<ol style="list-style-type: none"><li>1 Agrios G.N. 2005. Plant Pathology (fifth edition). Elsevier Pub. Amsterdam.</li><li>2 Ainsworth G.C. 1981. Introduction to the History of Plant pathology. Cambridge University.</li><li>3 Boyce, J.S. 1961. Forest Pathology. Mc Graw-Hill Book Co., Inc., NY. 572 hlm.</li><li>4 Blanchard, R.O. dan R. A. Tattar. 1981. Field and Laboratory Guide to Tree Pathology. Academic Press, London. 285 hlm</li><li>5 Hawley RP, Stickel WP. 1956. Forest protection. John Wiley &amp; Sons, New York.</li><li>6 Ilag LL. 1983. Learning the principles of plant pathology. NFAC-UPLB Countryside Action Program, UPLB at LosBanosCollege, Laguna.</li><li>7 Manion PD. 1981. Tree disease concepts. Prentice-Hall Inc. Englewood Cliffs, New Jersey. 399 hlm.</li><li>8 Tainter F.H. dan F.A. Baker. 1996. Principles of Forest Pathology. John Wiley and Sons, inc, Canada. 725 hlm.</li><li>9 Semangun H. 1996. Pengantar Ilmu Penyakit Tumbuhan. GAMA Univ. Press. Yogyakarta.</li><li>10 Suratmo FG. 1982. Ilmu Perlindungan Hutan. Fakultas Kehutanan IPB, Bogor.</li></ol> <p>Link Favorit :</p> <ol style="list-style-type: none"><li>11 <a href="http://www.cifor.cgiar.org">http://www.cifor.cgiar.org</a></li><li>12 <a href="http://www.dephut.go.id">http://www.dephut.go.id</a></li><li>13 <a href="http://www.rngr.net">http://www.rngr.net</a></li><li>14 <a href="http://www.worldagroforestrycentre.com">http://www.worldagroforestrycentre.com</a></li><li>15 <a href="http://www.aracruz.com.br">www.aracruz.com.br</a></li><li>16 <a href="http://www.camcore.org">www.camcore.org</a></li><li>17 <a href="http://www.csiro.au">www.csiro.au</a></li><li>18 <a href="http://www.na.sappi.com">www.na.sappi.com</a></li><li>19 <a href="http://www.rimbawan.com">www.rimbawan.com</a></li><li>20 <a href="http://www.sinarmasforestry.com">www.sinarmasforestry.com</a></li></ol>



**SVK335 Forest and Land Fire**

Modul name	<b>Forest and Land Fire</b>
Semester(s) in which module is taught	6 <sup>th</sup> semester
Person responsible for the module	Bambang Hero Saharjo
Lecturer	Lailan Syaufina Erianto Indra Putra Ati Dwi Nurhayati
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, cooperative learning, contextual instruction
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Forest Protection
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <li>1. Students are able to explain the background of the occurrence of forest and land fires in Indonesia, the factors that influence them and the negative impact on the environment and efforts to control them</li> <li>2. Students are able to practice measuring the factors that influence fire behavior, assessing the impact of forest fires and efforts to control activities</li> </ol>
Content	<p>Forest fires are the result of human actions, both intentionally and unintentionally (which are carried out with a specific purpose) as well as due to natural causes, causing both beneficial (temporary) and detrimental impacts. As a result of the occurrence of these fires with certain backgrounds, they also have an impact on the environment so that they must be prevented and overcome. This forest fire course provides an overview to students about the background of the occurrence of fires, their impacts and efforts to prevent and overcome them.</p> <p>This forest and land fire practicum is given so that students can better understand the materials given in lectures</p>
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)



Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (30%), final exam (30%), practicum (40%). The proportion of practicum score consists of report, quiz, Structured assignment, and practicum examination
Media employed	Textbooks, slides (power points), and films
Reading list	<ol style="list-style-type: none"> <li>1 Artsybashev, ES, 1985. Forest fires and their control. Russian translation series 15. Translator: K Bahaya, Editor: V Pandit, AA Baklema, Rotterdam/ Moscow, 1974.</li> <li>2 Brown, A. A. and K.P. Davis, 1973. Forest Fire: Control and Use. McGraw Hill Book Co. Inc. New York.</li> <li>3 Chandler, P., P. Cheney, P. Thomas, L. Trabaud and D. Williams, 1983. Forest Fire Vol I: Forest Fire Behaviour and Effects. John Wiley &amp; Sons. New York.</li> <li>4 DeBano, RN, Neavy DG, Ffolliot PE. 1998. Fire's effects on ecosystems. John Wiley &amp; Sons, New York. (Bab 3)</li> <li>5 Deeming JE. 1995. Pengembangan sistem penilaian bahaya kebakaran di Provinsi Kalimantan Timur. Laporan akhir, disampaikan pada GTZ GmbH, Republik Federal Jerman.</li> <li>6 Direktorat Perlindungan Hutan dan Kebun, 2003. Kebijakan Pemerintah Indonesia dalam upaya pengendalian kebakaran hutan dan kebun. Dalam Suratmo FG, Husaeni EA, Jaya NS (Ed.). Pengetahuan dasar pengendalian kebakaran hutan. Fakultas Kehutanan IPB, Bogor</li> <li>7 Hawley, R.P. and W.P. Stickel, 1956. Forest Protection. John Wiley &amp; Sons, New York.</li> <li>8 Ikhwanusaufa, GC, 2002. Penilaian bahaya kebakaran hutan di KPH Madiun dengan menggunakan Indeks Angstrom dan Indeks Kekeringan Keetch-Byram. Skripsi Sarjana Fakultas Kehutanan IPB, Bogor. Tidak diterbitkan.</li> <li>9 Keetch JJ, Byram GM, 1988. A drought index for forest fire control (Revision). USDA-Forest Service, Southeastern Forest Experiment Station, Asheville, North Carolina. USA.</li> <li>10 Nicolas MVJ, 2003. Pemadaman kebakaran hutan produksi, HPH dan HPHTI. Dalam Suratmo FG, Husaeni EA, Jaya NS (Ed.). Pengetahuan dasar pengendalian kebakaran hutan. Fakultas Kehutanan IPB, Bogor.</li> <li>11 Prakoso JH, 2003. Peralatan tangan. Dalam Suratmo FG, Husaeni EA, Jaya NS (Ed.). Pengetahuan dasar pengendalian kebakaran hutan. Fakultas Kehutanan IPB, Bogor.</li> <li>12 Pyne, S.J., P.L.Andrews., and R.D. Laven. 1996. Introduction to Wild land Fire.2nd edition. John Willey and Sons. New York.</li> <li>13 Syaufina L. 2008. Kebakaran hutan dan lahan di Indonesia: Perilaku api, penyebab dan dampak kebakaran. Bayumedia Publ. Malang</li> <li>14 Whelan, R.J. 1995. The ecology of fire. Cambridge University Press, Great Britain.</li> <li>15 Wright, H.A and A.W. Bailey. 1982. Fire Ecology. John Wiley and Sons, New York</li> </ol>



**SVK311 Soil and Water Conservation in Forest Utilization**

Modul designation	<b>Soil and Water Conservation in Forest Utilization</b>
Semester(s) in which module is taught	6 <sup>th</sup> Semester
The person responsible for the module	Omo Rusdiana
Lecturer	Cahyo Wibowo
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Elective Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours Total: 5400 minutes = 90 hours
Credit points	2 (2-0) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	Forest Influence
Module objectives/intended learning outcomes	Able to conclude the problem of land damage due to erosion and various methods of improvement.
Content	This course discusses geographical linkages and erosion potential, erosion control factors/erosion calculations, eroded soil, soil and water preservation methods, conservation building design, and evaluation of land capability.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (50%) and final exam (50%).
Reading list	<ol style="list-style-type: none"> <li>1 Purwowidodo. 1999. Pokok-Pokok Bahasan Konservasi Tanah di Kawasan Hutan. Bogor (ID): Institut Pertanian Bogor.</li> <li>2 Brady, NC. 1974. The Nature and Properties of Soils. 8th edition. Macmillan Publishing Co. Inc. London.</li> <li>3 Hardjowigeno, S. 2003. Klasifikasi Tanah dan Pedogenesis. Edisi Revisi. Penerbit Akademika Pressindo. Jakarta.</li> <li>4 Nambiar, EKS., and Brown, AG. (eds). 1982. Management of Soil, Nutrients and Water in Tropical Plantation Forests. ACIAR, CSIRO Australia, and CIFOR Indonesia. Australia.</li> <li>5 Ojakangas, RW. 1991. Introductory Geology. Schaums's Outline Series. McGraw-Hill, Inc. New York.</li> <li>6 Rowell, DL. 1994. Soil Science: Methods &amp; Applications. John Wiley &amp; Sons, Inc. New York.</li> </ol>



	7 Soil Survey Staff. 2006. Keys to Soil Taxonomy. Tenth Edition. United States Department of Agriculture.
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**SVK298 Research Methods and Scientific Writing**

Modul designation	<b>Research Methods and Scientific Writing</b>
Semester(s) in which the module is Taught	6 <sup>th</sup> Semester
The person responsible for the module	Dr. Ir. Lailan Syaufina, M.Sc.
Lecturer	Dr. Ir. Lailan Syaufina, M.Sc. Dr. Ir. Arum Sekar Wulandari, MS
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Elective Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 50 minutes x 1 sch x 14 weeks = 700 minutes = 12 hours Discussion class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 28 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 2 times x 14 weeks = 1940 minutes = 46 hours Total: 5400 minutes = 90 hours
Credit points	2 (1-3) sch = 3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	After completing this course, students will be able to explain and conduct research and writing based on the principles of ways of thinking and scientific principles.
Content	Research Methodology and Scientific Writing course provides students with an overview of how to formulate research problems, carry out research and report research results.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and requirements Examination	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%)



Reading list

1. Arikunto, S. 2000. Manajemen Penelitian. PT. Rineka Cipta. Jakarta.
2. Nazar, M. 1988. Metode Penelitian. PT. Ghalia Indonesia. Jakarta.
3. Siswadi. 2002. Pedoman Penulisan Karya Tulis Ilmiah. Program Pascasarjana, IPB. Bogor
4. Suharni. 2002. Metodologi Penelitian. PT Gramedia. Jakarta.
5. Susanto. 1989. Teknik Penulisan Skripsi. PT. Gramedia. Jakarta





**SVK497 Community Service Program**

Modul designation	<b>Community Service Program</b>
Semester(s) in which the Taught	6 <sup>th</sup> – 7 <sup>th</sup> Semester
The person responsible for the module	-
Lecturer	-
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, cooperative learning
Workload	Lecture class: 520 minutes x 1 time x 1 days = 520 minutes = 9 hours Community service: 240 minutes x 1 time x 30 days = 7200 minutes = 120 hours Exam: 120 minutes x 3 times = 360 minutes = 6 hours Total: 3 sch x 45 hours x 60 minutes = 8100 minutes = 135 hours
Credit points	3sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Students participating in the 2019 IPB KKNT are undergraduate program students (S1) IPB University who have met the requirements, namely having completed lectures of at least 105 credits with a GPA 2.00, and have registered to take part in KKN-Thematic in 2019.
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <li>a. The ability to identify, plan, carry out and evaluate community empowerment programs in agriculture in a broad sense, integrated industry-based agriculture and the environment (multi-interdisciplinary between study programs at IPB)</li> <li>b. Concern and high commitment, skilled communication, and collaboration between professions to contribute in overcoming problems in society,</li> <li>c. The ability to initiate and develop a network of stakeholder cooperation in efforts to solve problems to meet the needs of the dynamics of actual life in society,</li> <li>d. Increase the sense of care and empathy for problems faced in the community, as well as an understanding of the customs and culture of the community as well as a national outlook.</li> </ol>



Content	<p>The Thematic Fieldwork of the IPB University (KKNT IPB) is a form of education by providing students with learning experiences to live in the community outside the campus, who directly together with the community identify and deal with agricultural and environmental problems and other development issues that are faced in the area. IPB KKNT activities are expected to be able to hone soft skill partnerships, interdisciplinary / scientific teamwork (cross competence), and student leadership in managing development programs in rural areas. IPB KKNT activities are also expected to be an activity of IPB's academic community in helping to provide solutions to the problems of rural communities that are carried out on an ongoing basis so as to provide optimal benefits both for the community and local government as well as for IPB as an institution of Tridharma Perguruan Tinggi.</p>
Examination forms	<p>Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)</p>
Study and requirements Examination	<p>Providing field implementation assessments to students, evaluating, assessing reports and testing students KKNT participants and submit scores (field + report + exam) in the form of numbers to the IPB KKNT Committee no later than 1 (one) month after the completion of the KKNT activities.</p>
Reading list	-



# 7<sup>th</sup> SEMESTER



**SVK428 Natural Forest Silviculture**

Modul designation	<b>Natural Forest Silviculture</b>
Semester(s) in which module is taught	7 <sup>th</sup> semester
The person responsible for the module	Prijanto Pamoengkas
Lecturer	Supriyanto Adisti Permatasari Putri Hartoyo
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Small group discussion, collaborative learning, contextual instruction
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Silvics
Module objectives/intended learning outcomes	Able to analyze silvicultural systems based on factors of growing place and standing conditions in tropical forests, and rehabilitation methods at various levels of forest damage. Able to assess the success of the practice of natural forest silviculture systems based on growing factors and standing conditions in tropical forests, and rehabilitation methods at various levels of damage
Content	The natural forest silviculture course explains the application of silvicultural systems in the management of natural production forests in the tropics based on factors of growing place (climate and soil) and standing conditions for the purpose of forest sustainability. This course discusses several issues related to growing conditions, silvicultural bases or fundamentals, some examples of tropical silvicultural systems both in Indonesia and other tropical countries, and the impact of logging at various levels and its regeneration efforts. Analyzing the application of silvicultural systems in the management of natural production forests in the tropics based on factors of growth and standing conditions in tropical forests, and rehabilitation methods at various levels of forest destruction.
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)



Study and examination requirements	Assessment of students' achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (60%), quiz (10%), attendance (10%), and practicum examination (20%).
Reading list	<ol style="list-style-type: none"> <li>1 Departemen Kehutanan. 1993. Pedoman dan Petunjuk Teknis TPTI pada Hutan Alam Daratan. Jakarta.</li> <li>2 Bruenig, E. F. 1986. The Tropical Rainforest As Ecosystem. <i>Plant Research and Development</i> 24:15-30</li> <li>3 Bruenig, E.F. 1996. Conservation and Management of Tropical Rainforests: An Integrated Approach to Sustainability. CAB Cambridge.</li> <li>4 Bruijnzeel, L.A. and W.R.S. Chritchley. 1994. Environmental Impacts of Logging Moist Tropical Forests. UNESCO. Paris</li> <li>5 Duryea, M.L. and P.M. Dougherty. 1991. Forest Regeneration Manual. Kluwer Academic Publishers.</li> <li>6 Kobayshi, S. 1994. Effect of Harvesting Impacts and Rehabilitation of Tropical Rainforest. <i>Journal of Plant Research</i> 107:99 106</li> <li>7 Lamprecht, H. 1989. Silviculture in the Tropics. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. Technical Cooperation-Federal Republic of Germany. Eschborn.</li> <li>8 Lamprecht, H. 1993. Silviculture in the Tropical Natural Forests. Springer Verlag. Berlin</li> <li>9 Mori, T. 2001. Rehabilitation of Degraded Forests in Lowland Kutai, East Kalimantan, Indonesia.</li> <li>10 Nyland, R.D. 1996. Silviculture: Concepts and Applications. McGraw-Hill. Singapore.</li> <li>11 PT. Sari Bumi Kusuma. 2000. Petunjuk Teknis Sistem Silvikultur TPTJ. Pontianak</li> <li>12 Smith, D. M. , B.L. Larson, M.J. Kelty, and P.M.S. Ashton. 1997. The Practice of Silviculture: Applied Forest Ecology. John Wiley and Sons.</li> <li>13 Weidelt, H.J. 1988. On the Diversity of Tree Species in Tropical Rainforest Ecosystems. <i>Plant Research and development</i> 24: 15-30.</li> <li>14 Weidelt, H.J. 1993. Tropical Silviculture. Provisional Lecture Notes Winter and Summer Semester. Gottingen</li> <li>15 Manan, S.1995. Pelaksanaan Sistem Silvikultur Tebang Jalur Tanam Indonesia (TJTI). Badan penelitian dan Pengembangan Kehutanan. Departemen Kehutanan. Jakarta.</li> <li>16 Pamoengkas P. 2010. Potentialities of line planting technique in rehabilitation of logged over area referred to species diversity, growth and soil quality. <i>Biodiversitas</i>, 11:34-39.</li> <li>17 Pamoengkas P, Gandaseca S, Hardiansyah G, Priyanto, Jamaludin MR. 2014. Tree diameters and planting distance as the most important factors for the liberation of tree competitors in silvicultural systems of TPTJ. <i>Agriculture, Forestry and Fisheries</i>, 3 (5): 392-396.</li> <li>18 Pamoengkas P, Gandaseca S, Wahyudi, Andini D. 2015. Determination of silvicultural system based on vegetation</li> </ol>



	recovery process in logged-over area in Central Kalimantan, Indonesia. Wulfenia journal, 22 (5).
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**SVK427 Agroforestry**

Modul designation	<b>Agroforestry</b>
Semester(s) in which module is taught	7 <sup>th</sup> semester
Person responsible for the module	Nurheni Wijayanto
Lecturer	Irdika Mansur Adisti Permatasari Putri Hartoyo
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory course
Teaching methods	Small group discussion, collaborative learning, contextual instruction
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students are able to design the agroforestry system with considering the productivity, sustainability, and adoptability
Content	This course is designed to discuss the definition and concept of agroforestry, practice and system of agroforestry, species, soil productivity and protection in agroforestry system, design and evaluation of agroforestry system
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (35%), final exam (35%), practicum (30%). The proportion of practicum score consists of report (60%), quiz (10%), attendance (10%), and practicum examination (20%).
Reading list	<ol style="list-style-type: none"> <li>1. Nair, PKR. 1993. An Introduction to Agroforestri. Kluwer Academic Publisher in cooperation with ICRAF. Dordrecht, the Netherland.</li> <li>2. World Agroforestri Center (ICRAF). 2003. Bahan Ajaran Agroforestri I-IX. Bogor, Indonesia.</li> </ol>



**SVK431 Integrated Forest Pest and Disease Management**

Modul designation	<b>Integrated Forest Pest and Disease Management</b>
Semester(s) in which module is taught	7 <sup>th</sup> Semester
Person responsible for the module	Noor Farikhah Haneda
Lecturer	Achmad Elis Nina Herliyana Yunik Istikorini M. Alam Firmansyah Lufthi Rusniarsyah
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory Course
Teaching methods	Contextual Learning, Cooperatif learning, Discussion
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Biology
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <li>1. Students are able to analyze the problems of forest pests and diseases in the field and evaluate pest control and forest diseases based on their ecosystems in an integrated manner.</li> <li>2. Students are able to explain and practice forest pest, and disease monitoring measures and forest pest control and disease control efforts in the field and are able to explain the results of monitoring in the field.</li> </ol>
Content	Integrated Forest Pest control and disease is a Major course taught in semester 7 to all students of the Faculty of Forestry IPB who take a major in Silviculture. This course discusses the concept of integrated pest control and forest diseases which include; an understanding of the history of Integrated Control both from a global perspective and in the Indonesian perspective, basic components, and principles in biodiversity control; understanding the difference between natural forest ecosystems and plant forests; example withdrawal techniques in the field; understand the dynamics of pest and disease populations, factors that influence loss of outcomes, and control decision-making; understand integrated control techniques, and understand the policies related to forest protection laws and regulations. The results of integrated forest pest and disease





	control assessments will be used for sustainable forest management and management decision-making.
Examination forms	The assessment includes student presentations and group assignment reports, Essay Test, attendance and class activities
Study and examination requirements	Midterm exam 30% Final exam 30% The assignment of practice report 30% Structured assignment 10% If student attending the lectures >80% so they can join the
Reading list	<ol style="list-style-type: none"> <li>1 Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley &amp; Sons, Inc (USA). Bab 2, hal 95-302</li> <li>2 Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley &amp; Sons, Inc (USA). Bab 1</li> <li>3 Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley &amp; Sons, Inc (USA). Bab 1-2, hal 83-302</li> <li>4 Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley &amp; Sons, Inc (USA). Bab 2, hal 275-302</li> <li>5 Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley &amp; Sons, Inc (USA). Bab 3, hal 303-652</li> <li>6 Hawley RC, Stickel PW. Forest Protection Second Edition. John Wiley &amp; Sons, Inc, New York (USA). Bab 15-16</li> <li>7 Kadir AASA dan Barlow HS. 1992. Pest management and the environment in Indonesia. CAB Internasional. Bab 4, hal 181-250</li> <li>8 Lehman-Danzinger H. 1993. Introduction to Integrated Pest Management of Plant Diseases and Pests in the Tropics/ Subtropics. Third edition. Gottingen Germany. Bab 5, hal 36-54</li> <li>9 Lehman-Danzinger H. 1993. Introduction to Integrated Pest Management of Plant Diseases and Pests in the Tropics/ Subtropics. Third edition. Gottingen Germany. Bab 2, hal 2</li> <li>10 Lehman-Danzinger H. 1993. Introduction to Integrated Pest Management of Plant Diseases and Pests in the Tropics/ Subtropics. Third edition. Gottingen Germany. Bab 11, hal 126-140.</li> <li>11 Lehman-Danzinger H. 1993. Introduction to Integrated Pest Management of Plant Diseases and Pests in the Tropics/ Subtropics. Third edition. Gottingen Germany. Bab 11, hal 126-140</li> <li>12 Nair KSS. Insect Pest and Diseases in Indonesian Forests, An Assessment of Major threats, research efforts and literature. CIFOR. Bogor (ID). Bab 2-3</li> <li>13 Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 3-4.</li> </ol>



Reading list	<ol style="list-style-type: none"><li>14 Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 3-4.</li><li>15 Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 6</li><li>16 Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 3.</li><li>17 Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 4.</li><li>18 Pedigo LP. 2002. Entomology and Pest Management- Fourth edition. Pearson Education, Inc. New Jersey. Bab 8, hal 289-312</li><li>19 Pedigo LP. 2002. Entomology and Pest Management- Fourth edition. Pearson Education, Inc. New Jersey. Bab 6, hal 211-254</li><li>20 Pedigo LP. 2002. Entomology and Pest Management- Fourth edition. Pearson Education, Inc. New Jersey. Bab 7, hal 255-288</li><li>21 Pedigo LP. 2002. Entomology and Pest Management- Fourth edition. Pearson Education, Inc. New Jersey. Bab 17, hal 593-614</li><li>22 Seameo Biotrop. 1987. Forest Pest and Diseases in Southeast Asia. Biotrop Special Publication No. 26. Bogor (ID)</li><li>23 Seameo Biotrop. 1993. Integrated Pest Management Control Component. Biotrop Special Publication No. 50. Bogor (ID)</li><li>24 Speight MR, Wylie FR. 2001. Insect Pests of Tropical Forestry. CABI Publishing. New York (USA). Bab 10</li><li>25 Tallent-Halsell, NG. 1994. Forest Health Monitoring 1994, Field Methods Guide. EPA/620/R-94/027. U.S. Environmental Protection Agency, Washington Dc (USA). Bab 1</li><li>26 Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID). Bab 6, hal 100-114.</li><li>27 Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID).</li><li>28 Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID). Bab 8, hal 129-140</li><li>29 Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID). Bab 9, hal 141-162</li><li>30 Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID).</li></ol>
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Reading list	<p>31 Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 1-2</p> <p>32 Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 1-2</p> <p>33 Untung K. 2006 Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 15</p> <p>34 Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 5</p> <p>35 Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 6</p>
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**SVK436 Forest Health Monitoring**

Modul name	<b>Forest Health Monitoring</b>
Semester(s) in which module is taught	7 <sup>th</sup> semester
The person responsible for the module	Noor Farikhah Haneda
Lecturer	Supriyanto
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Elective Course
Teaching methods	Small group discussion, cooperative learning, contextual instruction
Workload	Lecture class: 50 minutes x 2 sch x 14 weeks = 1400 minutes = 23 hours Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours Exam: 120 minutes x 2 times = 240 minutes = 4 hours Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours Total: 8100 minutes = 135 hours
Credit points	3 (3-2) sch = 4.8 ECTS
Required and recommended prerequisites for joining the module	Forest Pest Science, Forest Patology
Module objectives/intended learning outcomes	Students are able to explain forest health monitoring methods to provide data that can be used as a basis for considering follow-up steps for sustainable forest management decisions
Content	Forest Health Monitoring is a major subject taught in the 7 <sup>th</sup> semester to all students of the Faculty of Forestry, IPB, who take the Silviculture major. This course discusses the concept of forest health; forest health criteria and indicators; forest health data collection methods and techniques for indicators of productivity, vitality, biodiversity and site quality, and other parameters. Management of forest health data and information and the process of multi-criteria analysis for forest health assessment are also discussed in this course. The results of the forest health assessment will be used for management decisions and sustainable forest management
Examination forms	Lecture examination (writing test in the midterm and final semester), practicum examination (writing test in the final semester and quiz)
Study and examination requirements	Assessment of students's achievement using proportion as follow: midterm exam (30%), final exam (30%), practicum (40%). The proportion of practicum score consists of report, quiz, Structured assignment, and practicum examination
Media employed	Textbooks, slides (power points), and films



Reading list	<ol style="list-style-type: none"><li>1 Cline SP, editor. 1995. <i>Environmental Monitoring and Assessment Program: Forest Health Monitoring. Quality Assurance Project Plan for Detection Monitoring Project. EPA 620/R-95/002</i>. Washington D.C: U.S. Environmental Protection Agency, Office of Research and Development.</li><li>2 DL Schmoltdt et. al. (eds). 2001. <i>The Analytic Hierarchy Process in Natural Resources and Environmental Decision Making</i>. Netherlands: Kluwer Academic Publ.</li><li>3 Erianto Indra Putra. 2004. <i>Pengembangan Metode Penilaian Kesehatan Hutan Alam Produksi</i>. [Thesis]. Sekolah Pascasarjana IPB.</li><li>4 <i>Forest Health Monitoring to Monitor the Sustainability of Indonesian Tropical Rain Forest Volume I</i> (Technical Report No. 1 – 9). ITTO and SEAMEO-BIOTROP.</li><li>5 <i>Forest Health Monitoring to Monitor the Sustainability of Indonesian Tropical Rain Forest Volume II</i> (Technical Report No. 10 – 21). ITTO and SEAMEO-BIOTROP.</li><li>6 <i>Forest Health Monitoring to Monitor the Sustainability of Indonesian Tropical Rain Forest Volume III</i> (Technical Report No. 22 – 29). ITTO and SEAMEO-BIOTROP.</li><li>7 Robert Mangold. 1997. <i>Forest Health Monitoring : Field Methods Guide</i> (International-Indonesia – 1997). USDA-Forest Service.</li><li>8 John L. Innes. 1993. <i>Forest Health: Its Assessment and Status</i>. CAB International</li></ol>
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# 8<sup>th</sup> SEMESTER



**SVK498 Seminar**

Modul designation	<b>Seminar</b>
Semester(s) in which module is taught	8 <sup>th</sup> semester
The person responsible for the module	Team Teaching of Department Silviculture
Lecturer	Team Teaching of Department Silviculture
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory course
Teaching methods	Final project presentation and discussion
Workload	Paper writing and drafting: 14 hours Seminar attendance: 25 times x 60 minutes = 25 hours Final project presentation: 60 minutes = 1 hour Paper revision: 5 hours Total: 2700 minutes = 45 hours
Credit points	1 sch (1.6 ECTS)
Required and recommended prerequisites for joining the module	1. Attending 25 seminars 2. Finishing the report of community service program 3. Passed 105 sch
Module objectives/intended learning outcomes	Students are able to arrange and submit the results of their final assignment studies in scientific forums
Content	-
Examination forms	-
Study and examination requirements	Assessment includes: the ability to deliver seminar papers, the ability to answer and the accuracy of answers, language and attitude, paper format, timeliness
Reading list	Panduan Penyelesaian Tugas Akhir (Guide book for Final Project)



**SVK499 Final Project**

Modul designation	<b>Final Project</b>
Semester(s) in which module is taught	8 <sup>th</sup> semester
The person responsible for the module	Team teaching of Department Silviculture
Lecturer	Team teaching of Department Silviculture
Language	Bahasa Indonesia (Indonesian language)
Relation to curriculum	Compulsory course
Final project methods	Research or Internship
Workload	Research and final project: 180 minutes x 90 days = 16200 minutes = 270 hours Total: 16200 minutes = 270 hours
Credit points	6 sch (9.6 ECTS)
Required and recommended prerequisites for joining the module	1. Registered in this course 2. GPA $\geq$ 2.00 3. Passed Compulsory Course with minimum grade is D 4. Passed 105 sch
Module objectives/intended learning outcomes	Students able to compile a scientific description of the results of the study in the form of a bachelor thesis or final project report
Content	-
Examination forms	-
Study and examination requirements	Assessment includes: the ability to deliver seminar papers, the ability to answer and the accuracy of answers, language and attitude, paper format, timeliness
Reading list	Panduan Penyelesaian Tugas Akhir (Guide book for Final Project)



**Department of Silviculture  
Faculty of Forestry and Environment**



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