IPB University
Bogor Indonesia

# MODULE HANDBOOK

## K2014 Curriculum

Department of Silviculture
Faculty of Forestry and Environment

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# CURRICULUM STRUCTURE OF SVC-SP

| No | Course | SCH | SKS | ECTS |
|---|---|---|---|---|
| **Semester 1** | | | | |
| 1 | Religion Education | 3(2-2) | 3 | 5 |
| 2 | Bahasa Indonesia | 2(1-2) | 2 | 3.4 |
| 3 | Introduction to Agricultural Science | 2(2-0) | 2 | 3.4 |
| 4 | Fundamentals of Mathematics | 3(2-2) | 3 | 5 |
| 5 | Chemistry | 3(2-3) | 3 | 5 |
| 6 | Biology | 3(2-3) | 3 | 5 |
| 7 | General Economics | 3(2-2) | 3 | 5 |
| **Semester 2** | | | | |
| 1 | Civics Education | 2(1-2) | 2 | 3.4 |
| 2 | English | 3(2-2) | 3 | 5 |
| 3 | Sports and Arts | 1(0-3) | 1 | 1.7 |
| 4 | Physics | 3(2-3) | 3 | 5 |
| 5 | General Sociology | 3(2-2) | 3 | 5 |
| 6 | Introduction to Entrepreneurship | 1(1-0) | 1 | 1.7 |
| 7 | Introduction to Forestry Science and Environmental Ethics | 2(2-0) | 2 | 3.4 |
| 8 | Bio-Resources Conservations | 2(2-0) | 2 | 3.4 |
| **Semester 3** | | | | |
| 1 | Dendrology | 3(2-3) | 3 | 5 |
| 2 | Silvics | 3(2-3) | 3 | 5 |
| 3 | Statistical Methods | 3(2-2) | 3 | 5 |
| 4 | Forest Products as Raw Materials | 2(2-0) | 2 | 3.4 |
| 5 | Forest Products Processing | 2(2-0) | 2 | 3.4 |
| 6 | Introduction to Soil Science | 3(2-3) | 3 | 5 |
| 7 | Climatology | 3(3-0) | 3 | 5 |
| **Semester 4** | | | | |
| 1 | Forest Ecology | 3(2-3) | 3 | 5 |
| 2 | Forest Protection | 3(2-3) | 3 | 5 |
| 3 | Forest Nutrition Management | 3(2-3) | 3 | 5 |
| 4 | Silviculture | 3(2-3) | 3 | 5 |
| 5 | Forest Resource Inventory | 3(2-3) | 3 | 5 |
| 6 | Experimental Design | 3(2-2) | 3 | 5 |

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|---|---|---|---|---|
| 7 | Geomatics and Forestry Remote Sensing | 3(2-3) | 3 | 5 |
| 8 | Field Forestry Practices | 3 | 3 | 5 |
| **Semester 5** | | | | |
| 1 | Forest Syn-ecology | 2(2-0) | 2 | 3.4 |
| 2 | Forest Influence | 3(2-3) | 3 | 5 |
| 3 | Forest Genetics | 3(2-3) | 3 | 5 |
| 4 | Forest Pest Science | 3(2-3) | 3 | 5 |
| 5 | Forest Plant Seed Technology | 3(2-3) | 3 | 5 |
| 6 | Forest Harvesting | 3(2-3) | 3 | 5 |
| **Semester 6** | | | | |
| 1 | Tropical Forest Species Ecology | 2(2-0) | 2 | 3.4 |
| 2 | Tree Breeding | 3(2-3) | 3 | 5 |
| 3 | Forest Plant Propagation Technology | 3(2-3) | 3 | 5 |
| 4 | Forest Disease Science | 3(2-3) | 3 | 5 |
| 5 | Forest and Land Fires | 3(2-3) | 3 | 5 |
| 6 | Research Methods and Scientific Writing | 2(1-3) | 2 | 3.4 |
| 7 | Forest Management | 3(2-3) | 3 | 5 |
| 8 | Forest Management Economics | 3(3-0) | 3 | 5 |
| 9 | Community Service Program (KKN-T) | 3 | 3 | 5 |
| **Semester 7** | | | | |
| 1 | Natural Forest Silviculture | 3(2-3) | 3 | 5 |
| 2 | Agroforestry | 3(2-3) | 3 | 5 |
| 3 | Forest Management Economics | 3(2-3) | 3 | 5 |
| **Semester 8** | | | | |
| 1 | Seminar | 1 | 1 | 1.7 |
| 2 | Final Project | 6 | 6 | 10 |
| **Major Elective Courses :** | | | | |
| 1 | Basics of Tree Physiology | 3(2-3) | 3 | 5 |
| 2 | Basics of Forest Microbiology* | 3(2-3) | 3 | 5 |
| 3 | Forest Soil Science | 2(2-0) | 2 | 3.4 |
| 4 | Plantation Forest Silviculture* | 3(2-3) | 3 | 5 |
| 5 | Basics of Post-Mining Land Reclamation and Forest Restoration* | 3(2-3) | 3 | 5 |
| 6 | Site Quality | 2(2-0) | 2 | 3.4 |
| 7 | Soil and Water Conservation (SWC) in Forest Utilization | 2(2-0) | 2 | 3.4 |
| 8 | Plantation Forest Development Planning | 3(2-3) | 3 | 5 |

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|---|---|---|---|---|
| 9 | Forest Health Monitoring | 3(2-3) | 3 | 5 |
| 10 | Forest and Land Fire Management | 3(2-3) | 3 | 5 |
| **TOTAL** | | | **146** | **254** |

*Examples of student enrichment course choices

# 1st SEMESTER

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

| Module designation | **Religion Education** |
|---|---|
| Semester(s) in which the module taught | 1st Semester |
| The person responsible for the module | Irzaman (Coordinator for IPB100)<br>Elisa Ganda Togu Manurung (Coordinator for IPB101)<br>Yohanes Driyanto (Coordinator for IPB102)<br>I Wayan Mangku (Coordinator for IPB103)<br>Hermawan Wana (Coordinator for IPB104)<br>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<br>Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours<br>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. |

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| Examination forms | Lecture examination (writing test in the midterm and final semester). |
| Study And examination requirements | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Problem solving practice<br>**Affective:** 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**

| | |
|---|---|
| Modul designation | **Bahasa Indonesia** |
| Semester(s) in which the module Taught | 1st 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<br>Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 3 times x 14 weeks = 2780 minutes = 46 hours<br>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). |

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| Study And Examination requirements | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Problem solving practices<br>**Affective:** 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**

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|---|---|
| Modul designation | **Introduction to Agricultural Science** |
| Semester(s) in which the module Taught | 1st Semester |
| The person responsible for the module | Prof. Dr. Ir. Hadi Susilo Arifin, M.S. |
| Lecturer | Prof. Dr. Ir. Kukuh Murtilaksono, M.S.<br>Prof. Dr. Ir. Ahmad Sulaeman, M.S. Dr. Ir. Budi Setiawan, M.S.<br>Prof. Dr. Ir. I. Komang Gede Wiryawan<br>Prof. Dr. Ir. Didi Sopandie, M.Agr.<br>Dr. Ir. Sugeng Santoso, M.Agr<br>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<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours<br>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). |

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| Study and examination requirements | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Affective:** Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort. |
| Reading list | 1. AHN: Buku PIP Author AHN (Book 1-Soft File)<br>2. KM: Buku Kumpulan Makalah (Book 2-Soft File)<br>3. TGM: Buku Tantangan Generasi Muda (Hard File) |

**MAT101 Fundamentals of Mathematics**

| | |
|---|---|
| Modul designation | **Fundamentals of Mathematics** |
| Semester(s) in which the module Taught | 1st 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<br>Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours<br>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).<br>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). |

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|---|---|
| Study and examination requirements | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Problem solving practice<br>**Affective:** 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 | **Chemistry** |
| Semester(s) in which the module Taught | 1st 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<br>Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours<br>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 | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Practice<br>**Affective:** Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, |
| Reading list | - |

**BIO100 Biology**

| | |
|---|---|
| Modul designation | **Biology** |
| Semester(s) in which the module Taught | 1st 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<br>Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours<br>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<br>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.<br>2. Observing and explaining the basic cellular reproduction and patterns of inheritance.<br>3. Observing and explaining the structure and expression of genes, and biotechnology.<br>4. Observing and explaining the diversity, structure and biological functions of organisms: monera,protists, fungi, plantae, animalia.<br>5. Observing and explaining the ecology: population, community, ecosystem and bioconservation. |

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| 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 | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Practice<br>**Affective:** 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.<br>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 | 1st 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<br>Discussion class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours<br>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 | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Practice<br>**Affective:** Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort. |

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| Reading list | 1. Books for lecture class: Lipsey. R. G., P. O Steiner, and D. D. Purpis. 1987. Economics. Harper International Edition.<br>2. Books for practical class:<br>a. Penuntun Responsi Ekonomi Umum. 2013. Departemen Ilmu Ekonomi (IE), Fakultas Ekonomi dan Manajemen (FEM). IPB.<br>b. Lipsey. R. G., P. O Steiner, and D. D. Purpis. 1987. Economics. Harper International Edition.<br>c. Gregory, M. 2006. Principles of Economics (Pengantar Ekonomi Mikro) Edisi 3. Salemba Empat. |

# 2nd SEMESTER

**IPB111 Civics Education**

| | |
|---|---|
| Modul designation | **Civics Education** |
| Semester(s) in which the module Taught | 2nd Semester |
| The person responsible for the module | Didid Diapari |
| Lecturer | Siti Rahmawati<br>Indah Wijayanti<br>Fana Dewi Savitri<br>Sri Rahayu<br>Ujang Sehabudin<br>Gunter<br>Sedarnawati Yasni<br>Sri Rachjati Eidman<br>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<br>Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 3 times x 14 weeks = 2780 minutes = 46 hours<br>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 | 1. Students understand the vision, mission and goals of Civics Education.<br>2. Students identify disturbances and threats to the nation and the Republic of Indonesia and state defense efforts adapted to global challenges.<br>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.<br>4. Student is able to explain the meaning of nationalism.<br>5. Student is able to analyze the importance of the state constitution<br>6. Student is able to describe the atmosphere when making the 1945 Constitution. |

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| | 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<br>8. Student is able to compare the implementation of the 1945 Constitution from time to time<br>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<br>10. Student is able to explain Pancasila as a system of philosophy and unity of precepts in Pancasila.<br>11. Student is able to analyze Pancasila as a source of values.<br>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.<br>13. Student is able to explain the problem of Indonesian citizenship.<br>14. Student is able to categorize the rights and obligations of Indonesian citizens.<br>15. Student is able to link the implementation of democracy with the enforcement of human rights.<br>16. Analyzing the implementation of democracy in Indonesia since the old order, new order and reform<br>17. Analyzing the efforts to promote, respect and uphold human rights in Indonesia and the world.<br>18. Student is able to relate the concept of geopolitics and archipelago insight.<br>19. Student is able to explain the concept of Indonesian territory.<br>20. Student is able to describe the implementation of national insights in national development.<br>21. Student is able to explain Indonesia's national resilience and implementation<br>22. Student is able to explain analyzing problems and formulating politics and national strategies.<br>23. Student is able to explain the principles of good governance in public organizations and state administration. |

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| | 24. Student is able to explain the implementation of regional autonomy.<br>25. Student is able to categorize corrupt acts and the importance of efforts to prevent corruption. |
| Content | 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 ofscience and technology and development. |
| Examination forms | Lecture examination (writing test in the midterm and final semester). |
| Study and examination requirements | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Practice<br>**Affective:** Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort |
| Reading list | 1. Membangun Kesadaran Bela Negara Dr. Ir. Parlaungan Adil Rangkuti,M.Si. IPB Press<br>2. Paradigma Baru Pendidikan Kewarganegaraan. Winarno,S.Pd, M.Si. PT.Bumi Aksara: 2008<br>3. Cerdas Kritis dan Aktif Berwarganegara, Pendidikan Kewarganegaraan Untuk Perguruan Tinggi. Heru Herdiawanto,M.Si dan Jumanta Hamdayama,M.Si, Erlangga: 2010<br>4. Panduan Kuliah Pendidikan Pancasila |

**IPB108 English**

| | |
|---|---|
| Modul designation | **English** |
| Semester(s) in which the module Taught | 2nd Semester |
| The person responsible for the module | Tatie Sadewo |
| Lecturer | Alfa Chasanah<br>Nilawati<br>Irma Rasita Gloria Barus<br>Muhammad Thonthowi Djauhari<br>Gatot Widodo<br>Ahmad Ridha<br>Amita Nucefera Nida Silma<br>Raden Adjeng Sri Sugyaningsih<br>Gifta Firdiana<br>Harries Marithasari<br>Lukman Gandarmaya<br>Rizdika Mardiana<br>Yose Eduar Muda<br>Reny Astiyarini Umas<br>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<br>Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours<br>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). |

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| Study and examination requirements | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Practice<br>**Affective:** Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort. |
| Reading list | 1. Abdulaziz, Helen Taylor, & Alfred D. Stover. 1980. Academic Challenges in Reading. Prentice-Hall, Inc.Englewood Cliffs, N.J.<br>2. Anson M. Chris, Schwegler A. Robert. 2001. The Longman Handbook for Writers and Readers, An Imprint of Addision Wesley Longman, Inc. 3. Dobbs, Carrie. 1989. Reading for a Reason. Prentice Hall Regents Englewood Cliffs, N.J. |

**FIS100 Physics**

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| Modul designation | **Physics** |
| Semester(s) in which the module Taught | 2nd 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<br>Practice class: 60 minutes x 3 sch x 14 weeks = 2520 minutes = 42 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 5 times x 14 weeks = 3940 minutes = 66 hours<br>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 | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Practice<br>**Affective:** Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) |
| Reading list | |

**KPM130 General Sociology**

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| Modul designation | **General Sociology** |
| Semester(s) in which the module is Taught | 2nd 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<br>Discussion class: 60 minutes x 2 sch x 14 weeks = 1680 minutes = 28 hours<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 6 times x 14 weeks = 4780 minutes = 80 hours<br>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). |

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| Study and examination requirements | **Cognitive:** Midterm exam, Final exam, Quizzes, Assignments<br>**Psychomotor:** Practice<br>**Affective:** Assessed from the element /variables achievement, namely (a) Contributions (attendance, active, role, initiative, language), (b) Being on time, (c) Effort. |
| Reading lists | 1. Soekanto, S., 1990. Sosiologi Suatu Pengantar. Jakarta: Rajawali Press.<br>2. Geertz, C. 1976. Agricultural Involution: process of ecological change in Indonesia. Berkeley: University of California Press.<br>3. Herskovits, M.J. 1955. Cultural Anthropology. New York: Alfred A. Knopf.<br>4. Koentjaraningrat (Ed.). 1979. Manusia dan Kebudayaan di Indonesia. Jakarta: Penerbit Djambatan.<br>5. Kluckhohn, F.R. 1961. "Dominant and variantvalue-orientation" in: FR Cluchohn & HA 25 Murray (Eds.), Personality in Nature, Society and Culture. New York: Alfred A Knoff.<br>6. Redfield, R. 1956. Peasant society and culture. Chicago: University of Chicago Press.<br>7. Tan, M.G. 1973. "Masalah perencanaan penelitian" dalam Koentjaraningrat (Ed.), Metode-metode Penelitian Masyarakat. Jakarta: LIPI.<br>8. Dorn, J.A.A. van & C.J. Lammers. 1959. Modern Sosiologie een sijstematische inleiding. Utreacht Antwerpen: Het Spectrum.<br>9. Charon, J.M. 1980. The Meaning of Sociology. Alfred Publishing Co. Inc. America.<br>10. Calhoun, C., et.al. 1994. Sociology (6th edition). McGraw-Hill, Inc. USA.<br>11. Wibisono, Koento. 1982. Arti Perkembangan Menurut Filsafat Positivisme Auguste Comte. Yogyakarta: Gadjah Mada University Press.<br>12. Gillin, J.L. & J.P. Gillin, 1954. Cultural Sociology (3rd printing). New York: The Macmillan Co.<br>13. Maiolo, J., et.al., 1991. Study Guide to Accompany Bassis, Gelles and Levine: Sociology An Introduction. McGraw-Hill, Inc. USA.<br>14. MacIver, R.M. & C.H. Page. 1957. Society and Introductory Analysis. New York: Rinehart and Company, Inc.<br>15. Merton, R.K. 1967. Social Theory and Social Structure. New York: The Free Press. Polak,<br>16. J.B.A.F.M. 1966. Sosiologi: Suatu Buku |

## AGB100 Introduction to Entrepreneurship

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| Modul designation | **Introduction to Entrepreneurship** |
| Semester(s) in which the module is Taught | 2nd 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<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 2 times x 14 weeks = 1760 minutes = 29 hours<br>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 entreprenerurships the nature and characteristics of entrepreneurs, the introduction and development of entrepreneurial personality, motivation and opportunities for entreprenerships, entrepreneurial characters, entrepreneurial ideas,and basic business planning |
| Examination forms | Lecture examination (writing test in the midterm and final semester). |
| Study and examination requirements | **Cognitive:** Assignment**Psychomotor:** -<br>**Affective:** 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.<br>2. Drucker, Peter, F. 1991. Inovasi dan Kewiraswastaan, Praktik dan Dasar-dasar. Alih Bahasa oleh Rusjdi Naib. Penerbit Erlangga.<br>3. Longenecker, Justin G. Carlos W. Moore, J.William Petty. 2000. Kewirausahaan, Manajemen Usaha Kecil. Penerbit Salemba Empat. |

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

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| Modul designation | **Introduction to Forestry Science & Environmental Ethic** |
| Semester(s) in which the module is Taught | 2nd Semester |
| The person responsible for the module | Endang Suhendang |
| Lecturer | Dudung Darusman<br>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<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours<br>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 | 1. Introduction and Scope of Forestry Science<br>2. Role of Forestry Science in Humans' Life<br>3. Development of Scope of Forestry Science; Position of Introduction to Forest Science in Forestry Science<br>4. Definition of Forest; Forest Classification; Forestry as Activity, Science, Profession, and System Roles, Functions, and Benefits of Forests in Humans' Life<br>5. Forest Condition in IndonesiaForester as a Profession and Professional<br>6. International Forestry<br>7. Basic of Environmental Ethics |
| 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:<br>midterm exam (50%) and final exam (50%) |

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| Reading list | 1. Suhendang E. 2013. Pengantar ilmu kehutanan: Kehutanan sebagai Ilmu Pengetahuan, Kegiatan, dan Bidang Pekerjaan. Bogor (ID): IPB Press 2.<br>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. |

**KSH201 Bio-Resources Conservations**

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| Modul designation | **Bio-Resources Conservations** |
| Semester(s) in which the module is Taught | 2nd Semester |
| The person responsible for the module | Sambas Basuni |
| Lecturer | Sambas Basuni<br>Agus Priyono Kartono<br>Harnios Arief<br>Burhanuddin Masyud<br>Lin Nuriah Ginuga<br>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<br>Exam: 120 minutes x 2 times = 240 minutes = 4 hours<br>Self-study: 60 minutes x 4 times x 14 weeks = 3760 minutes = 63 hours<br>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 naturalresources and their ecosystems |
| Content | Definitions and Objectives of Biological Resources Conservation<br>Conservation Movements<br>The Concept of Natural Resources<br>The Principles of Conservation Ecology<br>The Conceptual Basic for Conservation of Biological Resources<br>Scarcity and Extinction<br>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:<br>midterm exam (50%) and final exam (50%) |

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| Reading list | 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.<br>2. Brandon KE, Wells M. 1992. Planning for People and Parks: Design Dillemas. Journal WorldDevelopment Vol. 20 No. 4. Great Britain (UK):Pergamon Press Ltd. Pp:557-570<br>3. Conservation. IUCN-The World Conservation Union, Gland-Switzerland. Pp: 215-222<br>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.<br>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.<br>6. Lewis C (Ed.). 1996. Managing Conflicts in Protected Areas. IUCN The World Conservation Union, Gland-Switzerland.<br>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.<br>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<br>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.<br>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.<br>11. UNDP/FAO National Park Development Project. 1982. Rencana Konservasi Nasional Jilid I: Pendahuluan, Metoda Evaluasi dan Tinjauan |

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| | Kekayaan Alam (berdasarkan karya John MacKinnin-FAO).<br>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.<br>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). |

# 3rd SEMESTER

**SVK211 Dendrology**

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| Modul designation | **Dendrology** |
| Semester(s) in wich the module is taught | 3rd Semester |
| Person responsible for the module | 1. Dr Ir Iwan Hilwan, MS<br>2. Dr Ir Istomo, MS<br>3. Dr Ir Agus Hikmat, MSc |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours (7200 minutes) |
| Credit points | 3 credits (4.8 ECTS) |
| Required and recommended prerequisites for joining the module | 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'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. Harlow, W.M. and E.S. Harrar. 1985. Textbook of Dendrology. Mc Graw Hill Book Co., Inc. New York.<br>2. Keng, H. 1978. Orders and Families of Malayan Seed Plant. Singapore University Press. Singapore. |

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| | 3. Lawrence, G.H.M. 1951. Taxonomy of Vscular Plants. MacMillan Publishing Co.,Inc. New York.<br>4. Samingan, T. 1985. Dendrologi. Gramedia. Jakarta.<br>5. Tjirosoepomo, G. 1985. Morfologi Tumbuhan. Gajah Mada University Press. Yogyakarta.<br>6. Tjirosoepomo, G. 1991. Taksonomi Tumbuhan (Spermatophyta). Gajah Mada University Press. Yogyakarta.<br>7. Heyne K. 1987. *Tumbuhan Berguna Indonesia*. *Jilid II*. Jakarta (ID): Badan Litbang Kehutanan.<br>8. Prawira, S.A dan IGM Tantra. 1973. Pengenalan Jenis-jenis Pohon Penting (89 jenis). Lembaga Penelitian Hutan.Bogor.<br>9. PROSEA. 1995. Plant Resource of South-East Asia 5 : (1) Timber Trees : Major Commercial Timbers. Bogor.<br>10. PROSEA. 1995. Plant Resource of South-East Asia 5 : (2) Timber Trees : Minor Commercial Timbers. Bogor.<br>11. Steenis CGGJ van. 1972. *Flora Pegunungan Jawa.* Kartawinata JA, penerjemah. Bogor (ID): Pusat Penelitian Bogor LIPI. Terjemahan dari: *The Mountain Flora of Java*.<br>12. Wirjodarmodjo. 1959. Pohon-pohon Terpenting di Indonesia Seri I. Pengumuman No. 71. Lembaga Penelitian Hutan.Bogor. |

**SVK222 Silvics**

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| Modul designation | **Silvics** |
| Semester(s) in wich the module is taught | 3rd Semester |
| Person responsible for the module | 1. Prof Dr Ir Sri Wilarso Budi R, MS<br>2. Dr Ir Irdika Mansur, MFor Sc<br>3. Dr Ir Arum Sekar Wulandari, MS<br>4. Ir Andi Sukendro, MSi |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours (7200 minutes) |
| Credit points | 3 credits (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.<br>2. Kozlowski, T.T. and Pallardy, S.G. 1997. Physiology of Woody Plants. Academic Press. London.<br>3. Kozlowski and Kramer. 1960. Physiology of Trees. McGraw-Hill Book Company, New York.<br>4. Sangham, S.S. 1980. Silvics. Forestry training Unit Forestry Department, Peninsular, Malaysia.<br>5. Soekotjo. 1974. Silvika. Bagian Pendidikan Sekretariat Direktorat Jenderal Kehutanan. |

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| | 6. Wiratmoko, S. 1977. Departemen Manajemen Hutan Fakultas Kehutanan IPB, Bogor. |

**SVK214 Basics of Tree Physiology**

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| Modul designation | **Basics of Tree Physiology** |
| Semester(s) in wich the module is taught | 3rd Semester |
| Person responsible for the module | 1. Prof Dr Ir Sri Wilarso Budi R, MS<br>2. Dr Ir Arum Sekar Wulandari, MS |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours (7200 minutes) |
| Credit points | 3 credits (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. *Physiology of Woody Plants*. London: Academic Press.<br>2. Kozlowski, Kramer. 1960. *Physiology of Trees*. New York: McGraw-Hill Book Company.<br>3. Mulkey SS, Chazdon RL, Smith AP. 1996. *Forest Plant Ecophysiology*. New York: Chapman and Hall.<br>4. Sinha RK. 2004. *Modern Plant Physiology*. England: Alpha Science International Ltd. |

**SVK233 Forest Microbiology**

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| Modul designation | **Forest Microbiology** |
| Semester(s) in wich the module is taught | 3rd Semester |
| Person responsible for the module | Prof Dr Ir Achmad, MS |
| Lecturer | 1. Prof Dr Ir Dr Ir Achmad, MS<br>2. Dr Ir Elis Nina Herliyana, MSi<br>3. Dr Yunik Istikorini, SP, MP<br>4. Dr M. Alam Firmansyah, SHut, MSi |
| Language | Bahasa Indonesia |
| Relation to curriculum | Elective Course |
| Teaching methods | Textual Learning, Cooperatif learning, Disscussion |
| Workload | 120 menit (7200 minutes) |
| Credit points | 3 credit (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.<br>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 mycoplasms. |
| Examination forms | The assessment includes student presentations and group assignment reports, Essay Test, attendance and class activities |
| Study and examination requirements | Midterm exam 30%<br>Final exam 30%<br>The assignment of practice report 30%<br>Structured assignment 10%<br>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.<br>2. Alexander, M. 1977. Introduction to soil microbiology. John Wiley & Sons, NewYork. 467 p.<br>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. Boyce, J.S. 1961. Forest pathology. McGraw-Hill Book Co. Inc., New York. 572 p.
8. 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.
9. Campbell, R. 1985. Plant microbiology. Edward Arnold, London. 191.
10. 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.
11. 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 Schrubs. Academic Press, New York.
12. 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.
13. 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.
14. Levy, J.F. 1982. The place of basiodiomycetes 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.Basiodiomycetes 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.

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| | 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.<br>18. Pacioni, G. 1985. The Macdonald encyclopedia of mushrooms and toadstools. Macdonald Book, London. 512 p.<br>19. Tainter, F.H. and F.A. Baker. 1996. Principles of forest pathology. John Wiley & Sons, New York. 805 p.<br>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.<br>21. Zoberi, M.H. 1972. Tropical macrofungi, some common species. MacMillan, London. 158 p.. |

# 4th SEMESTER

**SVK212 Forest Ecology**

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| Modul designation | **Forest Ecology** |
| Semester(s) in wich the module is taught | 4th Semester |
| Person responsible for the module | 1. Prof Dr Ir Cecep Kusmana, MS<br>2. Dr Ir Iwan Hilwan, MS<br>3. Dr Ir Yadi Setiadi, M.Sc<br>4. Dr Ir Istomo, MS<br>5. Dr Ir Omo Rusdiana, M.Sc<br>6. Dr Ir Basuki Wasis, MS<br>7. Dr Ir Agus Hikmat, M.Sc<br>8. Dr Ir Cahyo Wibowo, M.Sc<br>9. Dr Ir Rahmad Hermawan, M.Sc. F. Trop |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours (7200 minutes) |
| Credit points | 3 credits (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's 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 | 1. Barnes BV, Zak DR, Denton SR, Spurr SH. 1998. *Forest Ecology*. John Wiley & Sons Inc. New York. |

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| | 2. Cox GW. 1972. *Laboratory Manual of General Ecology Second Edition*, WMC. Publ. Dubuque Iowa.<br>3. De Santo RS. 1978.*Concept Of Applied Ecology*. Springer Verlag. New York., Heidelberg, Berlin.<br>4. Ewusie JY. 1980. *Element of Tropical Ecology*. Heineman Educational Books Ltd. London.<br>5. Misra R. 1968. *Ecology Workbook*. Oxford & IBU. Publ. House, New Delhi, Bombay, Calcuta.<br>6. Mueller – Dumbois D, Ellenberg DH. 1974. *Aims and Methods of Vegetation Ecology*. John Wiley & Sons, New York.<br>7. Odum EP. 1971. *Fundamentals of Ecology. 3rd ed*. Saunders, Philadelphia, Pensylvania.<br>8. Smith DM. 1997. *The Practice of Silviculture: Applied Forest Ecology*. John Wiley & Sons Inc. New York.<br>9. Smith RL. 1986. *Elements of Ecology*. Harper & Row, Publishers, New York.<br>10. Soerianegara I, Indrawan A. 2006. *Ekologi Hutan Indonesia*. Laboratorium Ekologi Hutan. Jurusan Manajemen Hutan Fakultas Kehutanan Institut Pertanian Bogor.<br>11. Turner IM. *The Ecology of Trees*. Cambridge University Press. New York.<br>12. Vickery ML. 1984. *Ecology of Tropical Plant*. John Wiley & Sons. New York.<br>13. Whitmore TC, Burnham CP. 1984. *Tropical Rain Forest of the Far East*. Oxford University Press. |

**SVK232 Forest Protection**

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| Modul designation | **Forest Protection** |
| Semester(s) in wich the module is taught | 4th Semester |
| Person responsible for the module | Prof. Dr. Ir. Bambang Hero Saharjo, M.Agr. |
| Lecturer | 1. Prof Dr Ir Achmad, MS<br>2. Prof Dr Ir Bambang Hero Saharjo, M.Agr<br>3. Dr Ir Lailan Syaufina, MSc<br>4. Dr Ir Noor Farikhah Haneda, MS<br>5. Dr Ir Elis Nina Herliyana, MS<br>6. Dr Yunik Istikorini, SP, MP<br>7. Dr Erianto Indra Putra, SHut, MS<br>8. Ati Dwi Nurhayati, SHut, MSi<br>9. M. Alam Firmansyah, SHut, MSi<br>10. Lufthi Rusniarsyah, SP, MSi |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Contextual Learning, Cooperatif learning, Disscussion |
| Workload | 120 menit |
| Credit points | 3 credit (4.8 ECTS) |
| Required and recommended prerequisites for joining the module | Biology |
| Module objectives/intended learning outcomes | 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.<br><br>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. |
| 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 |

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| | 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%<br>Final exam 30%<br>The assignment of practice report 30%<br>Structured assignment 10%<br>If student attending the lectures >80% so they can join the exam |
| Media employed | Text books, slides (power points), and films |
| Reading list | 1. Borror DJ, Triplehorn CA, Johnson NF. 1992. Pengenalan pelajaran serangga. (Diter-jemahkan oleh S. Partosoedjono dan MD Brotowidjoyo). Gadjah Mada University Press, Yogyakarta. (Bab 3).<br>2. Boyce JS. 1948. Forest pathology. 3rd ed. McGraw Hill Book Co. Inc. New York.<br>3. Brown AA, Davis KP. 1973. Forest fire: Control and use. McGraw Hill Book Co. Inc. New York.<br>4. Chandler P, Cheney P, Thomas P, Trabaud L, Williams D. 1983. Forest fire Vol I: Forest fire behaviour and effects. John Wiley & Sons. New York.<br>5. Coulson R.N, Witter JA. 1984. Forest entomology: Ecology and management. John Wiley & Sons New York. (Bab 2)<br>6. Dharmaputra, O.S. dkk 1989. Mikologi Dasar. Institut Pertanian Bogor, Bogor. 274 hlm.<br>7. DeBano LE, Neavy DG, Ffolliott PE. 1998. Fire's effects on ecosystems. John Wiley & Sons, New York.<br>8. Hadioetomo, R.S. 1993. Mikrobiologi Dasar dalam Praktik. PT Gramedia Pustaka Utama, Jakarta. 163 hlm<br>9. Ilag LL. 1983. Learning the principles of plant pathology. NFAC-UPLB Countryside Action Program, UPLB at Los Banos College, Laguna.<br>10. Haneda NF. 2008. Panduan praktikum perlindungan hutan (bagian hama hutan). Fakultas Kehutanan IPB, Bogor (Bab 1)<br>11. Hawley RP, Stickel WP. 1956. Forest protection. John Wiley & Sons, New York. (Bab 17)<br>12. Husaeni EA, 2008. Perladangan berpindah (hand out)<br>13. Husaeni EA, 2008. Penggembalaan liar (hand out)<br>14. Husaeni EA, 2008. Pencurian hasil hutan (hand out)<br>15. Husaeni EA, 2001. Hama hutan tanaman. (Diktat). Fakultas Kehutanan IPB, Bogor<br>16. Manion PD. 1981. Tree desease concepts. Prentice-Hall Inc. Englewood Cliffs, New Jersey.<br>17. Suratmo FG. 1982. Ilmu perlindungan hutan. Fakultas Kehutanan IPB, Bogor. (Bab 5 dan 7) |

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| | 18. Syaufina L. 2008. Kebakaran hutan dan lahan di Indonesia: Perilaku api, penyebab dan dampak kebakaran. Bayumedia Publishing, Malang.<br>19. Tapa Darma, IGK. Tehnik laboratorium patologi hutan. (Panduan Praktikum). Laboratorium Patologi Hutan, Jurusan Manajemen Hutan, Fakultas Kehutanan IPB, Bogor<br>20. Syaufina L. 2008. Kebakaran hutan dan lahan di Indonesia: Perilaku api, penyebab dan dampak kebakaran. Bayumedia Publishing, Malang.<br>21. Saharjo BH. 2016. Pengendalian Kebakaran Hutan dan atau Lahan Indonesia. IPB Press, Bogor. 232 hal. ISBN:978-602-440-014-9<br>22. Sunjaya PI. 1970. Dasar-dasar ekologi serangga. Diktat, Fakultas Pertanian IPB. |

**SVK317 Forest Nutrition Management**

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| Modul designation | **Forest Nutrition Management** |
| Semester(s) in wich the module is taught | 4th Semester |
| Person responsible for the module | 1. Dr Ir Basuki Wasis, MS<br>2. Dr Ir Cahyo Wibowo, M.Sc |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours |
| Credit points | 3 credits (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 | 1. Anonimous. 1991. Kesuburan Tanah. Jakarta (ID): Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan.<br>2. Binkley D. 1987. Forest Nutrition Managemnent. New York (US): A Wiley-Interscience Publication John Wiley & Sons.<br>3. Fisher RF, Binkley D. 2000. Ecology and Management of Forest Soils Third Edition. New Yorak (US): John Wiley and Sons, Inc.<br>4. Hardjowigeno S. 1989. Ilmu Tanah. Jakarta (ID): PT. Mediyatma Sarana Perkasa. |

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| | 5. Hamzah Z. 1983. Diktat Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB.<br>6. Jordan CF. 1985. Nutrient Cycling in Tropical Forest Ecosystem. New York (US): John Wiley & Sons.<br>7. Lutz HJ Chandler RF. 1965. Forest Soils. New York (US): John Wiley and Sons, Inc.<br>8. Manan S. 1997. Hutan Rimbawan dan Masyarakat. Bogor (ID): IPB Press.<br>9. Taylor CMA. 1995. Forest Fertilisation in Britain. London (UK): Forestry Commission Bulletin 95.<br>10. Wasis B. 1993. Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB. |

**SVK322 Silviculture**

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| Modul designation | **Silviculture** |
| Semester(s) in wich the module is taught | 3rd, 4th, 5th semester |
| Person responsible for the module | 1. Prof Dr Ir Sri Wilarso Budi, MS<br>2. Prof Dr Ir Iskandar Z Siregar, MForSc<br>3. Dr Ir Arum Sekar Wulandari, MS<br>4. Dr Ir Irdika Mansur, MForSc<br>5. Dr Ir Cahyo Wibowo, MScFTrop<br>6. Dr Ir Prijanto Pamoengkas, MScFTrop<br>7. Ir Andi Sukendro, MSi |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours |
| Credit points | 3 credits (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 | 1. Anonim. 1993. Pedoman dan Petunjuk Teknis Tebang Pilih Tanam Indonesia (TPTI) Pada Hutan Alam Daratan. Departemen Kehutanan, Direktorat Jenderal Pengusahaan Hutan. Jakarta. |

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| | 2. Budi, S.W. 2009. Petunjuk *Praktikum* Silvikultur. Laboratorium Silvikultur Fakultas Kehutanan IPB.<br>3. Daniels, T.W., J.A. Helms dan F.S. Baker. 1987. Prinsip-Prinsip Silvikultur. Gadjah Mada University Press. Yogyakarta.<br>4. Departemen Kehutanan. 2003. Eksekutif Data Strategis Kehutanan. Bidang Statistik Kehutanan-Departemen Kehutanan. Jakarta<br>5. Departemen Kehutanan dan Perkebunan. 1999. Panduan Kehutanan Indonesia. Koperasi Karyawan Dephutbun. Jakarta<br>6. Dransfield, S. and E.A. Widjaja (Eds.). 1995. Bamboos. PROSEA. Bogor.<br>7. Evans, J. 1992. Plantation Forestry in the Tropics. Clarendon Press. Oxford.<br>8. Hartmann, H.T, D.E. Kester and F.T. Davies. 1990. Plant Propagation: Principles and Practices. Prentice-Hall International. New Jersey.<br>9. Haygreen, J.H. and Bowywr, J.L. 1989. Hasil hutan dan Ilmu Kayu, Suatu Pengantar. Gadjah Mada University Press.<br>10. Kobayashi, S. *et al*. (Eds.). 2001. Rehabilitation of Degraded Tropical Forest Ecosystems. CIFOR. Jakarta<br>11. Kozlowski, T.T and Pallardy, S.G. 1996. Physiology of Woody Plants. Academic Press. London.<br>12. Lamprecht, H. 1989. Silviculture in the Tropics. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmBH. Technical Cooperation-Federal Republic of Germany. Eschborn.<br>13. Prasetyo, L. *et al*. (Eds.) 2003. Survey on Silvicultural Techniques and Plantation Promoting Policies in Indonesia. FORDA-JICA. Bogor<br>14. Manan, S. 1976. Silvikultur. Proyek Pengembangan/Peningkatan Perguruan Tinggi. IPB. Bogor.<br>15. Matthews, J.D. 1989. Silvicultural Systems. Clarendon Press, Oxford.<br>16. Oliver, C.D and Larson, B.C. Forest Stand Dynamics. McGraw-Hill, Inc.<br>17. Princhett, W.L. 1979. Properties and Management of Forest Soils. John Wiley & Sons, New York.<br>18. Schmidt, L. 2000. Guide to Handling of Tropical and Sub Tropical Forest Seed. Danida. Humlebaek, Denmark.<br>19. Yasman, I. Dan W.T.M. Smits. 1988. Metoda Pembuatan Stek *Dipterocarpaceae*. Asosiasi Panel Kayu Indonesia. Jakarta. |

**SVK213 Forest Soil Science**

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| Modul designation | **Forest Soil Science** |
| Semester(s) in wich the module is taught | 4th Semester |
| Person responsible for the module | 1. Dr Ir Omo Rusdiana, M.Sc<br>2. Dr Ir Cahyo Wibowo, M.Sc |
| Language | Bahasa Indonesia |
| Relation to curriculum | Elective Course |
| Teaching methods | Interactive lecture, Collaborative learning |
| Workload | 80 hours |
| Credit points | 2 credit (3.2 ECTS) |
| Required and 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 | 1. Brady, NC. 1974. The Nature and Properties of Soils. 8th edition. Macmillan Publishing Co. Inc. London.<br>2. Hardjowigeno, S. 2003. Klasifikasi Tanah dan Pedogenesis. Edisi Revisi. Penerbit Akademika Pressindo. Jakarta.<br>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.<br>4. Ojakangas, RW. 1991. Introductory Geology. Schaums's Outline Series. McGraw-Hill, Inc. New York.<br>5. Rowell, DL. 1994. Soil Science: Methods & Applications. John Wiley & Sons, Inc. New York.<br>6. Soil Survey Staff. 2006. Keys to Soil Taxonomy. Tenth Edition. United States Department of Agriculture.<br>7. Wilde, SA. 1958. Forest Soils: Their Properties and Relation to Silviculture. The Ronald Press Company, New York. |

**SVK223 Plantation Forest Silviculture**

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| Modul designation | **Plantation Forest Silviculture** |
| Semester(s) in wich the module is taught | 4th Semester |
| Person responsible for the module | 1. Dr Ir Irdika Mansur, M.For.Sc.<br>2. Ir Andi Sukendro, MSi<br>3. Dr Ir Cahyo Wibowo, MScFTrop |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, contextual instruction |
| Workload | 120 hours |
| Credit points | 3 credits (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.<br>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. |
| 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.<br>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 |

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| | proportion of practicum score consists of report (60%), quiz (10%), attendance (10%), and practicum examination (20%). |
| Reading list | 1. Martawijaya A, Kartasujana I, Kadir K, Prawira SA. 1981. Atlas Kayu Indonesia. Jilid 1. Badan Litbang Kehutanan, Departemen Kehutanan. Jakarta<br>2. Martawijaya A, Kartasujana I, Mandang YI, Prawira SA, Kadir K. 1989. Atlas Kayu Indonesia. Jilid 2. Badan Litbang Kehutanan, Departemen Kehutanan. Jakarta<br>3. Abdurrohim S, Mandang YI, Sutisna U. 2004. Atlas Kayu Indonesia. Jilid 3. Badan Litbang Kehutanan, Departemen Kehutanan. Jakarta<br>4. Evans J. -----. Plantation forest in the tropics.------ |

# 5th SEMESTER

**SVK313 Forest Syn-ecology**

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| Modul designation | **Forest Syn-ecology** |
| Semester(s) in wich the module is taught | 5th Semester |
| Person responsible for the module | 1. Prof Dr Ir Cecep Kusmana, MS<br>2. Dr Ir Istomo, MS |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Interactive Lecture, Collaborative learning |
| Workload | 80 hours |
| Credit points | 2 credits (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 | 1. Anwar, J., S.J. Damanik, N. Hisyam, A.J Whitten.1984. The Ecology of Sumatra. Gadjah Mada University Press.<br>2. MacKinnon, K., G. Hatta, H. Halim, A. Mangalik. 1996. The Ecology of Kalimantan. Periplus Edition (HK) Ltd.<br>3. Monk, KA., YD Fretes, G. Reksodihardjo. 1997. The Ecology of Nusa Tenggara and Maluku . Periplus Edition (HK) Ltd<br>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.<br>5. Whitmore, TC, C.P Burnham. 1984. Tropical Rain Forest of the Far East. Oxford University Press<br>6. Whitten, A.J., M. Mustafa, G.S. Henderson. 1987. The Ecology of Sulawesi. Gadjah mada University Press.<br>7. Whitten, J. RE Soeriatmaja, SA Afiff.1996. Ecology of Jawa and Bali. Periplus Edition (HK) Ltd. |

**SVK315 Forest Influence**

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| Modul designation | **Forest Influence** |
| Semester(s) in wich the module is taught | 5th Semester |
| Person responsible for the module | 1. Dr Ir Omo Rusdiana<br>2. Dr Ir Lailan Syaufina, M.Sc |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours |
| Credit points | 3 credit (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 Managemnent. A Wiley-Interscience Publication John Wiley & Sons. New York.<br>2. Borman, F.H., and Likens, G.F. 1979. Patterns and progress in a Forested Ecosystem. Springer-Verlag, New York.<br>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.<br>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.<br>5. Bruce, J.P. and Clark, R.H. 1977. Intoduction to Hydrometeorology. Pergamon Press. Oxford. |

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| | 6. Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan. 1991. Kesuburan Tanah. Jakarta.<br>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.<br>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. Penterjemah: Suryanata, K. (Ed): Tjitrosoepomo, G., 1997. Daerah Aliran Sungai Hutan Tropika, Tanggapan Hidrologi dan Tanah Terhadap Penggunaan atau Konservasi. Gadjah Mada University Press.<br>9. Landsberg, J.J., and Gower, S.T. 1997. Application of Physiologycal Ecology to Forest Management. Academic Press. San Diego, Calofornia.<br>10. Jordan C. F. 1985. Nutrient Cycling in Tropical Forest Ecosystem. John Wiley & Sons. New York.<br>11. Lee, R., 1980. Forest Hydrology. Columbia university Press. N.Y. Edisi Bahasa Indonesia. Penterjemah : Subagio, S.1988. Hidrologi Hutan. Gadjah Mada University Press<br>12. Lutz H. J. and R. F. Chandler. 1965. Forest Soils. John Wiley and Sons, Inc. New York. 514 p.<br>13. Schwab et al., 1986. Soil and Conservation Engineering.<br>14. Staf Jurusan Geomet IPB. 1982. Klimatologi Dasar. Jurusan Geomet IPB.<br>15. Susilo P. 2000. Meteorologi. ITB Bandung.<br>16. Taylor, C. M. A. 1995. Forest Fertilisation in Britain. Forestry Commission Bulletin 95. London. 34 p<br>17. Viessman, W.Jr., Lewis, G.L., and Knapp, J.W. 1989. Intriduction to Hydrology. Harper &Row Publishers, Inc. |

**SVK323 Forest Genetics**

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| Modul designation | **Forest Genetics** |
| Semester(s) in wich the module is taught | 5th Semester |
| Person responsible for the module | 1. Dr Ir Ulfah Juniarti, M.Agr<br>2. Prof Dr Ir Iskandar Z. Siregar, M.For.Sc |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours |
| Credit points | 3 credits (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.<br>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'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. Avers, C.J. 1984. Genetics. Willard Grant Press. 644pp.<br>2. Falconer, D.S. and T.F.C. Mackay. 1996. Introduction to Quantitative Genetics. Fourths Edition. Longman. 464pp.<br>3. Finkeldey, R. 2004. An Introduction to Tropical Forest Genetics. Inst. Forest Genet. Tree Breed. Georg-August Univ. Gottingen. |

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| | 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.<br>5. Hartl, D.L. and A.G. Andrew. Principles of Population Genetics. Second Edition. Sinauer Assoc. Inc. 682pp.<br>6. Wright, J.W. 1976. Introduction to Forest Genetics. Academic Press, New York. 463pp. |

**SVK332 Forest Pest Science**

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| Modul name | **Forest Pest Science** |
| Semester(s) in wich the module is taught | 5th Semester |
| Person responsible for the module | Dr. Ir. Noor Farikhah Haneda, M.Si |
| Lecturer | 1. Dr. Ir. Noor Farikhah Haneda, M.Si<br>2. Lufthi Rusniarsyah, SP, M.Si |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group disscussion, cooperative learning, contextual instruction |
| Workload | 120 hours |
| Credit points | 3 credits (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<br>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 | 1. Borror, DJ, CA Triplehorn & NF Johson. 1996. Pengenalan Serangga. UGM Press, Yogjakarta<br>2. Coulson, RN & JA Witter. 1984. Forest Entomology., Ecology and Management. John Willy&Son, New York |

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| | 3. Finney, D.J. 1962. Probit Analysis. Cambridge University Press.<br>4. Husaeni EA, Kasno, Haneda NF, Oemijati R. 2006. Pengantar Hama Hutan di Indonesia: Bio-ekology dan Teknik Pengendalian. Departemen Silvikultur, Fakultas Kehutanan, IPB.<br>5. Kalshoven, LGE. 1983. The Pests of Crops in Indonesia. PT Ichtiar Bharu, Jakarta.<br>6. Matthews, GA. 1979. Pesticide Applications Methods.<br>7. Pedigo, LP. 2002. Entomology and Pest Management. Precentice Hall. New Jersey.<br>8. Wadley, FM. 1967. Experimental Statistics in Entomology. |

**SVK326 Forest Seed Technology**

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| Modul designation | **Forest Seed Technology** |
| Semester(s) in wich the module is taught | 5th semester |
| Person responsible for the module | 1. Dr Ir Supriyanto<br>2. Ir Andi Sukendro, MSi<br>3. Dr Ir Arum Sekar Wulandari, MS |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours |
| Credit points | 3 credits (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'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. Bonner FT, Karrfalt RP, editor. 2008. *The Woody Plant Seed Manual*. USA: U.S. Department of Agriculture, Forest Service.<br>2. Gordon AG. 1992. *Seed Manual for Forest Trees*. Britain: H.M. Stationery Office.<br>3. Schmidt L. 2000. *Guide to Handling of Tropical and Subtropical Forest Seed*. Denmark: Danida Forest Seed Center.<br>4. Publikasi Perbenihan Tanaman Hutan Tropika Indonesia. |

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| | 5. Sudrajat DJ, Nurhasybi, Bramasto Y. 2015. *Standar Pengujian dan Mutu Benih Tanaman Hutan*. Bogor: Forda Press. |

**Basics of Post-Mining Land Reclamation and Forest Restoration**

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| Modul designation | **Basic of Post-Mining Land Reclamation and Forest Restoration** |
| Semester(s) in wich the module is taught | 5th semester |
| Person responsible for the module | 1. Dr Ir Basuki Wasis, M.Si<br>2. Dr Ir Irdika Mansur, M.Sc<br>3. Bayu Winata, S.Hut, M.Si. |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload (inc. Contact | 120 hours |
| Credit points | 3 credit (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%). |

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| Reading list | 1. Hand Out Mata Kuliah Dasar Dasar Reklamasi Lahan Pasca Tambang dan Restorasi Hutan<br>2. UU No 4 tahun 2009 tentang pertambangan mineral dan batubara<br>3. Munir M. 1995. Geologi dan Mineralogi Tanah. Pustaka Jaya. Jakarta<br>4. Cornnell DW. Dan Miller GJ. 1995. Kimia dan Ekotosikologi Pencemaran. Penerbit UI, Jakarta<br>5. Notodarmojo S. 2005. Pencemaran Tanah dan Air Tanah . Penerbit ITB Bandung<br>6. Arsyad S. 2006. Konservasi Tanah dan Air. IPB Press. Bogor .<br>7. Jordan C. F. 1985. Nutrient Cycling in Tropical Forest Ecosystem. John Wiley & Sons. New York.<br>8. Hardjowigeno, S. 1986. Ilmu Tanah. Akademi Pressindo. Jakarta<br>9. Lutz H. J. and R. F. Chandler. 1965. Forest Soils. John Wiley and Sons, Inc. New York. 514 p.<br>10. Anonimous. 1991. Kesuburan Tanah. Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan dan Kebudayaan. Jakarta. |

**SVK312 Growth Site Quality**

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| Modul designation | **Growth Site Quality** |
| Semester(s) in wich the module is taught | 5th semester |
| Person responsible for the module | 1. Dr Ir Basuki Wasis, MS<br>2. Dr Ir Cahyo Wibowo, M.Sc |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Interactive Lecture, Collaborative learning |
| Workload | 80 hours |
| Credit points | 2 credits (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.<br>2. Binkley D. 1987. Forest Nutrition Managemnent. New York (US): A Wiley-Interscience Publication John Wiley & Sons.<br>3. Fisher RF, Binkley D. 2000. Ecology and Management of Forest Soils Third Edition. (New York (US): John Wiley and Sons.<br>4. Hardjowigeno S. 1989. Ilmu Tanah. Jakarta (ID): PT. Mediyatma Sarana Perkasa. Jakarta.<br>5. Hamzah Z. 1983. Diktat Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB.<br>6. Jordan C F. 1985. Nutrient Cycling in Tropical Forest Ecosystem. New York (US): John Wiley & Sons. |

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| | 7. Lutz HJ, Chandler RF. 1965. Forest Soils. New York (US): John Wiley and Sons, Inc.<br>8. Manan S. 1997. Hutan Rimbawan dan Masyarakat. Bogor (ID): IPB Press.<br>9. Taylor CMA. 1995. Forest Fertilisation in Britain. London (UK): Forestry Commission Bulletin 95.<br>10. Wasis B. 1993. Ilmu Tanah Hutan. Bogor (ID): Jurusan Manajemen Hutan Fahutan IPB.<br>11. Wasis B. 2006. Perbandingan kualitas tempat tumbuh antara daur pertama dengan daur kedua pada hutan tanaman Acacia mangium Willd. (studi kasus di HTI PT. Musi Hutan Persada, Provinsi Sumatera Selatan) [Disertasi]. Bogor (ID): Sekolah PascasarjanaIPB. |

# 6th SEMESTER

**SVK314 Tropical Forest Spesies Ecology**

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| Modul designation | **Tropical Forest Spesies Ecology** |
| Semester(s) in wich the module is taught | 6th Semester |
| Person responsible for the module | 1. Dr Ir Istomo, MSc<br>2. Dr Ir Iwan Hilwan, MS |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Theory, collaborative learning |
| Workload | 80 hours |
| Credit points | 2 credit (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.<br>2. Misra, K.C. 1974. Manual of Plant Ecology. Oxford & IBH Publising Co. New Delhi-Bombay-Calcutta.<br>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.<br>4. Shukla, R.S. and P.S. Chandel. 1982. Plant Ecology and Soil Science. S. Chand & Company LTH. Ramnagar, New Delhi<br>5. Kimmins, J.P. Forest Ecology. 1987. Macmillan Publising Company New York.<br>6. Sitompul. S.M and B. Guritno. 1995. Analisis Pertumbuhan Tanaman. Gadjah Mada University Press. |

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| | 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.<br>8. Appanah, S. And J. M. Turnbull (Editors). 1998. A Riview of Dipterocarpars : Taxonomy, Ecology and Silviculture. CIFOR.<br>9. Hensleigh, T.E and B.K. Holaway (editors). 1988. Agroforestry Species for the Philippines. Funded By U.S. Peace Corps. Washington D.C.<br>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.<br>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.<br>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.<br>13. Verheij, E. W. M. And R.E. Corone (Editors). 1992. Plant Resources of South-East Asia 2 : Edible Fruits and Nuts. Prosea, Bogor.<br>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.<br>15. Sosef, M.S.M., L.T. Hong and S. Prawirohatmodjo (eds.). 1998. Plant Resources of South-East Asia. No 5 (3) Timber treees : Lesser-known timbers. Backhuys Publishers. Leiden. |

**SVK324 Tree Improvement**

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| Modul designation | **Tree Improvement** |
| Semester(s) in wich the module is taught | 6th semester |
| Person responsible for the module | 1. Prof Dr Ir Iskandar Z. Siregar, MforSc<br>2. Dr Ir Ulfah Juniarti Siregar, MAgr |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours |
| Credit points | 3 credits (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.<br>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.<br>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 | 1. Burley, J and B.T. Styles. 1976. Tropical Trees, Variation, Breeding and Conservation. Commonwealth Forestry Institute Academic Press, New York.<br>2. 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.
3. Departemen Kehutanan. 2002. Petunjuk Teknis Identifikasi dan Deskripsi Sumber Benih. Direktorat Perbenihan Tanaman Hutan, Direktur Jenderal Rehabilitasi Lahan dan Perhutanan Sosial, Departemen Kehutanan.
4. Djamhuri, E. 2009. Seleksi Pohon Plus. Bagian Silvikultur, Departemen Silvikultur Fakultas Kehutanan IPB.
5. Falconer, D.S. 1960. Introduction to Quantitative Genetics, Ronald Press, New York.
6. _____1975. Seed Orchards. Forestry Comnission Bulletin No. 54. Her Majesty's Stationary Office, London.
7. Finkeldey, R. 1998. An Introduction to Tropical Forest Genetics. Institute of Forest Genetics and Forest Tree Breeding. Georg-Agust-University Gottingen, Germany.
8. Francis CY, Boyle T, Rongcai Y, Ye Z, Xiyan JM. 1999. *Popgene version 1.31 quick user guide.* Canada (EU): University of Alberta.
9. 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.
10. Hartmann, H.T and D.E. Kester. 1983. Plant Propagation Principles and Practice. Fourth Edition. Prentice-Hall, Inc. Englewood Cliffs, New Jersey.
11. Namkoong, G. 1979. Introduction to Quantitative Genetics in Forestry. Technical Bulletin No. 1588.U.S Forest Services, Washington, DC.
12. Laporan-laporan hasil uji provenansi di Indonesia
13. Nasoetion, A.H dan Barizi. 1979. Metode Statistika untuk Penarikan Kesimpulan. PT Gramedia, Jakarta.
14. Schmidt, L. 1993 a. Seed Stands Guidelines on Establishment and Management Practices. RAS/91/004. Field Manual No. 3.
15. _____.1993 b. Seed Orchards Guidelines on Estabilishment and Management Pratices. RAS/91/004. Field Manual No. 4. Los Banos, Philipines : UNDP/FAO Forest Tree Improvement Project.
16. Soerianegara, I dan E. Djamhuri, 1979. Pemuliaan Pohon Hutan. Departemen Manajemen Hutan, Fakultas Kehutanan IPB.
17. Publikasi dan laporan pembangunan kebun benih
18. Publikasi dan laporan program pemuliaan pohon di Indonesia
19. Rohfl FJ. 1998. *NTSYSpc Numerical Taxonomy and Multivariate Analysis System Version 2.0 User Guide*. New York (US): State University of New York.
20. Steel, R.G.D and J.H. Torrie. 1981. Principles and Procedure of Statistics. A Biometrical Approach. Second Edition.

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| | International Student Edition. Mc Graw-Hill. International Book Company, Sydney,Tokyo.<br>21. Soerianegara, I dan E. Djamhuri, 1979. Pemuliaan Pohon Hutan. Departemen Manajemen Hutan, Fakultas Kehutanan IPB.<br>22. 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.<br>23. Williams, E.R; A.C. Matheson and C.E. Harwood 2002. Experimental Design and Analysis For Tree Improvement. Second Edition. CSIRO Publishing, Australia.<br>24. Zobel, B.J and T.T Talbert. 1984. Applied Forest Tree Improvement. John Wiley and Sons, New York. |

**SVK325 Forest Tree Propagation Technology**

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| Modul designation | **Forest Tree Propagation Technology** |
| Semester(s) in wich the module is taught | 6th semester |
| Person responsible for the module | 1. Dr Ir Arum Sekar Wulandari, MS<br>2. Ir Andi Sukendro, MS |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 120 hours |
| Credit points | 3 credits (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. *Vegetative Propagation of Tropical Tree Species by Stem Cuttings.* USA: F/FRED Project Management Office<br>2. Fretz TA, Read PE, Peele MC. 1979. *Plant Propagation Lab Manual*. USA: Burgess.<br>3. Hartmann HT, Kester DE, Davies FT, Geneve RL. 1997. *Plant Propagation: Principles and Practices.* USA: Prentice-Hall Inc.<br>4. Jain SM, Gupta PK, Newton RJ. 2013. Somatic Embryogenesis in Woody Plants. USA: Springer.<br>5. Jaenicke H, Beniest J. 2002. *Vegetative Tree Propagation in Agroforestry: Training Guidelines and References*. Kenya: ICRAF Kul Graphics Ltd.<br>6. Lewis WJ, Alexander DM. 1979. *Grafting and Budding: a Practical Guide for Fruit and Nut Plants and Ornamentals.*. 2nd ed. Australia: Landlinks Press |

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| | 7. Longman KA. 1993. *Rooting Cuttings of Tropical Trees*. Tropical Trees: *Propagation and Planting Manuals Volume 1*. London: Commonwealth Science Council.<br>8. Razdan MK. 2003. *Introduction to Plant Tissue Culture*. 2nd ed. India: Science Publishers, Inc.<br>9. Pierik RLM. 1997. *In Vitro Culture of Higher Plants*. Dordrecht: Klower Acad. Publ.<br>10. Saad AIM, Elshahed AM. 2012. *Recent Advances in Plant in vitro Culture: Plant Tissue Culture Media*. http://dx.doi.org/10.5772/50569.<br>11. Smith RH. 2013. *Plant Tissue Culture: Techniques and Experiments*. 3rd Ed. New York: Academic Press.<br>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.<br>13. Yasman I, Smith WTM. 1988. *Metode Pembuatan Stek Dipterocarpaceae*. Jakarta: APHI.<br>14. Video: How to prepare tissue culture media Part1. https://youtu.be/RwkIk-s1e_o<br>15. Video: Preparing Tissue Culture Media. https://youtu.be/8OrFf6hnyfY<br>16. Video: Plant tissue culture basics. https://youtu.be/bi755vQVNx8<br>17. Video: Introduction to the Tissue Culture Lab. https://www.youtube.com/watch?v=siEfHSSiGgg |

**SVK333 Forest Pathology**

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| Modul designation | **Forest Pathology** |
| Semester(s) in wich the module is taught | 6th Semester |
| Person responsible for the module | Dr Ir Elis Nina Herliyana, MSi |
| Lecturer | 1. Prof Dr Ir Achmad, MS<br>2. Dr Ir Elis Nina Herliyana, MSi<br>3. Dr Yunik Istikorini, SP, MP<br>4. Dr M. Alam Firmansyah, SHut, MSi |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Contextual Learning, Cooperatif learning, Disscussion |
| Workload | 120 menit |
| Credit points | 3 credit (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%<br>Final exam 30%<br>The assignment of practice report 30%<br>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 G.N. 2005. Plant Pathology (fifth edition). Elsevier Pub. Amsterdam. |

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| | 2. Ainsworth G.C. 1981. Introduction to the History of Plan pathology. Cambridge University.<br>3. Boyce, J.S. 1961. Forest Pathology. Mc Graw-Hill Book Co., Inc., NY. 572 hlm.<br>4. Blanchard, R.O. dan R. A. Tattar. 1981. Field and Laboratory Guide to Tree Pathology. Academic Press, London. 285 hlm<br>5. Hawley RP, Stickel WP. 1956. Forest protection. John Wiley & Sons, New York.<br>6. Ilag LL. 1983. Learning the principles of plant pathology. NFAC-UPLB Countryside Action Program, UPLB at LosBanosCollege, Laguna.<br>7. Manion PD. 1981. Tree desease concepts. Prentice-Hall Inc. Englewood Cliffs, New Jersey. 399 hlm.<br>8. Tainter F.H. dan F.A. Baker. 1996. Principles of Forest Pathology. John Wiley and Sons, inc, Canada. 725 hlm.<br>9. Semangun H. 1996. Pengantar Ilmu Penyakit Tumbuhan. GAMA Univ. Press. Yogyakarta.<br>10. Suratmo FG. 1982. Ilmu Perlindungan Hutan. Fakultas Kehutanan IPB, Bogor.<br>11. Link Favorit :<br>12. http://www.cifor.cgiar.org<br>13. http://www.dephut.go.id<br>14. http://www.rngr.net<br>15. http://www.worldagroforestrycentre.com<br>16. www.aracruz.com.br<br>17. www.camcore.org<br>18. www.csiro.au<br>19. www.na.sappi.com<br>20. www.rimbawan.com<br>21. www.sinarmasforestry.com |

**SVK335 Forest and Land Fire**

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| Modul name | **Forest and Land Fire** |
| Semester(s) in wich the module is taught | 6th semester |
| Person responsible for the module | Prof. Dr. Ir. Bambang Hero Saharjo, M.Agr |
| Lecturer | 1. Prof. Dr. Ir. Bambang Hero Saharjo, M.Agr<br>2. Dr. Ir. Lailan Syaufina, M.Sc<br>3. Dr. Erianto Indra Putra, S.Hut, M.S<br>4. Ati Dwi Nurhayati, S.Hut, M.Si |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group disscussion, cooperative learning, contextual instruction |
| Workload | 120 hours |
| Credit points | 3 credits (4.8 ECTS) |
| Required and recommended prerequisites for joining the module | Forest Protection |
| Module objectives/intended learning outcomes | 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<br>2. Students are able to practice measuring the factors that influence fire behavior, assessing the impact of forest fires and efforts to control activities |
| Content | 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.<br>This forest and land fire practicum is given so that students can better understand the materials given in lectures |
| 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 |

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| Reading list | 1. Artsybashev, ES, 1985. *Forest fires and their control*. Russian translation series 15. Translator: K Bahaya, Editor: V Pandit, AA Baklema, Rotterdam/ Moscow, 1974.<br>2. Brown, A..A. and K.P. Davis, 1973. *Forest Fire: Control and Use*. McGraw Hill Book Co. Inc. New York.<br>3. Chandler, P., P. Cheney, P. Thomas, L. Trabaud and D. Williams, 1983. *Forest Fire Vol I: Forest Fire Behaviour and Effects*. John Wiley & Sons. New York.<br>4. DeBano, RN, Neavy DG, Ffolliot PE. 1998. *Fire's effects on ecosystems*. John Wiley & Sons, New York. (Bab 3)<br>5. Deeming JE. 1995. *Pengembangan sistem penilaian bahaya kebakaran di Provinsi Kalimantan Timur*. Laporan akhir, disampaikan pada GTZ GmbH, Republik Federal Jerman.<br>6. Direktorat Perlindungan Hutan dan Kebun, 2003. *Kebijaksanaan Pemerintah Indonesia dalam upaya pengendalian kebakaran hutan dan kebun.* Dalam Suratmo FG, Husaeni EA, Jaya NS (Ed.). Pengetahuan dasar pengen-dalian kebakaran hutan. Fakultas Kehutanan IPB, Bogor<br>7. Hawley, R.P. and W.P. Stickel, 1956. *Forest Protection*. John Wiley & Sons, New York.<br>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.<br>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.<br>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.<br>11. Prakoso JH, 2003. *Peralatan tangan*. Dalam Suratmo FG, Husaeni EA, Jaya NS (Ed.). Pengetahuan dasar pengendalian kebakaran hutan. Fakultas Kehu-tanan IPB, Bogor.<br>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.<br>13. Syaufina L. 2008. *Kebakaran hutan dan lahan di Indonesia: Perilaku api, penyebab dan dampak kenbakaran.* Bayumedia Publ. Malang<br>14. Whelan, R.J. 1995. *The ecology of fire*. Cambridge University Press, Great Britain.<br>15. Wright, H.A and A.W. Bailey. 1982. *Fire Ecology*. John Wiley and Sons, New York |

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

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| Modul designation | **Soil and Water Conservation in Forest Utilization** |
| Semester(s) in wich the module is taught | 6th Semester |
| Person responsible for the module | Dr Ir Omo Rusdiana, M.Sc |
| Language | Bahasa Indonesia |
| Relation to curriculum | Elective Course |
| Teaching methods | Small group discussion, collaborative learning, cooperative learning |
| Workload | 80 hours |
| Credit points | 2 credit (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 | 1. Purwowidodo. 1999. Pokok-Pokok Bahasan Konservasi Tanah di Kawasan Hutan. Bogor (ID): Institut Pertanian Bogor.<br>2. Brady, NC. 1974. The Nature and Properties of Soils. 8th edition. Macmillan Publishing Co. Inc. London.<br>3. Hardjowigeno, S. 2003. Klasifikasi Tanah dan Pedogenesis. Edisi Revisi. Penerbit Akademika Pressindo. Jakarta.<br>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.<br>5. Ojakangas, RW. 1991. Introductory Geology. Schaums's Outline Series. McGraw-Hill, Inc. New York.<br>6. Rowell, DL. 1994. Soil Science: Methods & Applications. John Wiley & Sons, Inc. New York.<br>7. Soil Survey Staff. 2006. Keys to Soil Taxonomy. Tenth Edition. United States Department of Agriculture. |

# 7th SEMESTER

**SVK428 Natural Forest Silviculture**

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| Modul designation | **Natural Forest Silviculture** |
| Semester(s) in wich the module is taught | 7th semester |
| Person responsible for the module | 1. Dr Ir Prijanto Pamoengkas, MscFTrop<br>2. Dr Ir Supriyanto<br>3. Adisti Permatasari Putri Hartoyo, SHut, MSi |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Small group discussion, collaborative learning, contextual instruction |
| Workload | 120 hours |
| Credit points | 3 credits (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.<br>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.<br>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'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 | 1. Departemen Kehutanan. 1993. Pedoman dan Petunjuk Teknis TPTI pada Hutan Alam Daratan. Jakarta |

2. Bruenig, E. F. 1986. The Tropical Rainforest As Ecosystem. Plant Research and Development 24:15-30
3. Bruenig, E.F. 1996. Conservation and Management of Tropical Rainforests : An Integrated Approach to Sustainability. CAB Cambridge.
4. Bruijnzeel, L.A. and W.R.S. Chritchley. 1994. Environmental Impacts of Logging Moist Tropical Forests. UNESCO. Paris
5. Duryea, M.L. and P.M. Dougherty. 1991. Forest Regeneration Manual. Kluwer Academic Publishers.
6. Kobayshi, S. 1994. Effect of Harvesting Impacts and Rehabilitation of Tropical Rainforest. Journal of Plant Research 107:99 106
7. Lamprecht, H. 1989. Silviculture in the Tropics. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmBH. Technical Cooperation-Federal Republic of Germany. Eschborn.
8. Lamprecht, H. 1993. Silviculture in the Tropical Natural Forests. Springer Verlag. Berlin
9. Mori, T. 2001. Rehabilitation of Degraded Forests in Lowland Kutai, East Kalimantan, Indonesia.
10. Nyland, R.D. 1996. Silviculture : Concepts and Applications. McGraw-Hill. Singapore.
11. PT. Sari Bumi Kusuma. 2000. Petunjuk Teknis Sistem Silvikultur TPTJ. Pontianak
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.
13. Weidelt, H.J. 1988. On the Diversity of Tree Species in Tropical Rainforest Ecosystems. Plant Research and development 24: 15-30
14. Weidelt, H.J. 1993. Tropical Silviculture. Provisional Lecture Notes Winter and Summer Semester. Gottingen
15. Manan, S. 1995. Pelaksanaan Sistem Silvikultur Tebang Jalur Tanam Indoinesia (TJTI). Badan penelitian dan Pengembangan Kehutanan. Departemen Kehutanan. Jakarta.
16. Pamoengkas P. 2010. Potentialities of line planting technique in rehabilitation of logged over area referred to species diversity, growth and soil quality. *Biodiversitas,* 11: 34-39.
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. *Agriculture, Forestry and Fisheries,* 3 (5): 392-396.
18. Pamoengkas P, Gandaseca S, Wahyudi, Andini D. 2015. Determination of silvicultural system based on vegetation recovery process in logged-over area in Central Kalimantan, Indonesia. *Wulfenia journal,* 22 (5).

**SVK427 Agroforestry**

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| Modul designation | **Agroforestry** |
| Semester(s) in wich the module is taught | 7th semester |
| Person responsible for the module | Prof. Dr. Ir. Nurheni Wijayanto, M.S |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory course |
| Teaching methods | Small group discussion, collaborative learning, contextual instruction |
| Workload | 120 hours |
| Credit points | 3 credits (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, sutainability, 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 agroforetsry 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 | 1. Nair, PKR. 1993. An Introduction to Agroforestri. Kluwer Academic Publisher in cooperation with ICRAF. Dordrecht, the Netherland.<br>2. World Agroforestri Center (ICRAF). 2003. Bahan Ajaran Agroforestri I-IX. Bogor, Indonesia. |

**SVK431 Integrated Forest Pest and Disease Management**

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| Modul designation | **Integrated Forest Pest and Disease Management** |
| Semester(s) in wich the module is taught | 7th Semester |
| Person responsible for the module | Dr Ir Noor Farikhah Haneda, MS |
| Lecturer | 1. Dr Prof Dr Ir Achmad, MS<br>2. Dr Ir Noor Farikhah Haneda, MS<br>3. Dr Ir Elis Nina Herliyana, MS<br>4. Dr Yunik Istikorini, SP MP<br>5. M. Alam Firmansyah, SHut, MSi<br>**6.** Lufthi Rusniarsyah, SP, MSi |
| Language | Bahasa Indonesia |
| Relation to curriculum | Compulsory Course |
| Teaching methods | Contextual Learning, Cooperatif learning, Disscussion |
| Workload | 120 menit |
| Credit points | 3 credit (4.8 ECTS) |
| Required and recommended prerequisites for joining the module | Biology |
| Module objectives/intended learning outcomes | 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.<br>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. |
| 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 |

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| Study and examination requirements | Midterm exam 30%<br>Final exam 30%<br>The assignment of practice report 30%<br>Structured assignment 10%<br>If student attending the lectures >80% so they can join the exam |
| Reading list | 1. Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley & Sons, Inc (USA). Bab 2, hal 95-302<br>2. Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley & Sons, Inc (USA). Bab 1<br>3. Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley & Sons, Inc (USA). Bab 1-2, hal 83-302<br>4. Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley & Sons, Inc (USA). Bab 2, hal 275-302<br>5. Coulson RN, Witter JA. 1984. Forest Entomologi Ecology and Management. John Wiley & Sons, Inc (USA). Bab 3, hal 303-652<br>6. Hawley RC, Stickel PW. Forest Protection Second Edition. John Wiley & Sons, Inc, New York (USA). Bab 15-16<br>7. Kadir AASA dan Barlow HS. 1992. Pest management and the environment in Indonesia. CAB Internasional. Bab 4, hal 181-250<br>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<br>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<br>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<br>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<br>12. Nair KSS. Insect Pest and Diseases in Indonesian Forests, An Assessment of Major threaths, research efforts and literature. CIFOR. Bogor (ID). Bab 2-3<br>13. Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 3-4.<br>14. Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 3-4.<br>15. Oka IN. 2005. Pengendalian Hama Terpadu dan |

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| | Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 6<br>16. Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 3.<br>17. Oka IN. 2005. Pengendalian Hama Terpadu dan Implementasinya di Indonesia. Gadjah Mada University Press. Yogyakarta (ID). Bab 4.<br>18. Pedigo LP. 2002. Entomology and Pest Management-Fourth edition. Pearson Education, Inc. New Jersey. Bab 8, hal 289-312<br>19. Pedigo LP. 2002. Entomology and Pest Management-Fourth edition. Pearson Education, Inc. New Jersey. Bab 6, hal 211-254<br>20. Pedigo LP. 2002. Entomology and Pest Management-Fourth edition. Pearson Education, Inc. New Jersey. Bab 7, hal 255-288<br>21. Pedigo LP. 2002. Entomology and Pest Management-Fourth edition. Pearson Education, Inc. New Jersey. Bab 17, hal 593-614<br>22. Seameo Biotrop. 1987. Forest Pest and Diseases in Southeast Asia. Biotrop Special Publication No. 26. Bogor (ID)<br>23. Seameo Biotrop. 1993. Integrated Pest Management Control Component. Biotrop Special Publication No. 50. Bogor (ID)<br>24. Speight MR, Wylie FR. 2001. Insect Pests of Tropical Forestry. CABI Publishing. New York (USA). Bab 10<br>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<br>26. Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID). Bab 6, hal 100-114.<br>27. Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID).<br>28. Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID). Bab 8, hal 129-140<br>29. Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID). Bab 9, hal 141-162<br>30. Tarumingkeng RC. 1994. Dinamika Populasi, Kajian ekologi kuantitatif. Pustaka Sinar Harapan. Jakarta (ID).<br>31. Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 1-2<br>32. Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 1-2 |

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| | 33. Untung K. 2006 Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 15<br>34. Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 5<br>35. Untung K. 2006. Pengantar Pengelolaan Hama Terpadu. Gadjah Mada University Press. Yogyakarta (ID). Bab 6 |

**SVK436 Forest Health Monitoring**

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| Modul name | **Forest Health Monitoring** |
| Semester(s) in wich the module is taught | 7th semester |
| Person responsible for the module | Dr. Ir. Noor Farikhah Haneda, M.Si |
| Lecturer | 1. Dr. Ir. Noor Farikhah Haneda, M.Si<br>2. Dr. Ir. Supriyanto, DEA |
| Language | Bahasa Indonesia |
| Relation to curriculum | Elective Course |
| Teaching methods | Small group disscussion, cooperative learning, contextual instruction |
| Workload | 120 hours |
| Credit points | 3 credits (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 7th 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 | Text books, slides (power points), and films |
| Reading list | 1. Cline SP, editor. 1995. *Environmental Monitoring and Assessment Program: Forest Health Monitoring. Quality Assurance Project Plan for Detection Monitoring Project. EPA 620/R-95/002*. Washington D.C: U.S. Environmental Protection Agency, Office of Research and Development. |

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| | 2. DL Schmoldt *et. al.* (eds). 2001. *The Analytic Hierarchy Process in Natural Resources and Environmental Decision Making*. Netherlands : Kluwer Academic Publ.<br>3. Erianto Indra Putra. 2004. *Pengembangan Metode Penilaian Kesehatan Hutan Alam Produksi*. [Thesis]. Sekolah Pascasarjana IPB.<br>4. Forest Health Monitoring to Monitor the Sustainability of Indonesian Tropical Rain Forest Volume I (Technical Report No. 1 – 9). ITTO and SEAMEO-BIOTROP.<br>5. Forest Health Monitoring to Monitor the Sustainability of Indonesian Tropical Rain Forest Volume II (Technical Report No. 10 – 21). ITTO and SEAMEO-BIOTROP.<br>6. Forest Health Monitoring to Monitor the Sustainability of Indonesian Tropical Rain Forest Volume III (Technical Report No. 22 – 29). ITTO and SEAMEO-BIOTROP.<br>7. Robert Mangold. 1997. *Forest Health Monitoring : Field Methods Guide (International-Indonesia – 1997).* USDA-Forest Service.<br>8. John L. Innes. 1993. *Forest Health : Its Assessment and Status*. CAB International |

# 8th SEMESTER

**SVK498 Seminar**

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| Modul designation | **Seminar** |
| Semester(s) in which module is taught | 8th 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<br>Seminar attendance: 25 times x 60 minutes = 25 hours<br>Final project presentation: 60 minutes = 1 hour<br>Paper revision: 5 hours<br>Total: 2700 minutes = 45 hours |
| Credit points | 1 sch (1.6 ECTS) |
| Required and recommended prerequisites for joining the module | 1. Attending 25 seminars<br>2. Finishing the report of community service program<br>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 | 1. Tim Revisi Edisi ke-4. 2019. Pedoman Penulisan Karya Ilmiah Tugas Akhir Mahasiswa. IPB Press. Bogor (ID).<br>2. Panduan Penyelesaian Tugas Akhir (Guide book for Final Project)<br>3. Aunuddin. (2005). Statistika : Rancangan dan analisis data. Bogor: IPB Press.<br>4. Indriatno, I., & Irwinsyah, R. (1998). Aplikasi analisis tabulasi silang (Crosstab) dalam perencanaan wilayah dan kota. Jurnal PWK No.2.<br>5. Lind, A. D., Marchal, W.G., & Wathen, S.A. (2012). Statistical techniques in business & economics. USA: McGraw-Hill.<br>6. Santoso. (2004). Mengolah data statistik secara profesional. Jakarta: Elex Media Komputindo.<br>7. Sugiyono. (2003). Statistika untuk penelitian. Bandung: Alfabeta. |

**SVK149B Final Project**

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| Modul designation | **Final Project** |
| Semester(s) in which module is taught | 8th 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<br>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<br>2. GPA ≥ 2.00<br>3. Passed Compulsory Course with minimum grade is D<br>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 | 1. Tim Revisi Edisi ke-4. 2019. Pedoman Penulisan Karya Ilmiah Tugas Akhir Mahasiswa. IPB Press. Bogor (ID).<br>2. Panduan Penyelesaian Tugas Akhir (Guide book for Final Project)<br>3. Aunuddin. 2005. Statistika : Rancangan dan analisis data. Bogor: IPB Press.<br>4. Lind, A. D., Marchal, W.G., & Wathen, S.A. 2012. Statistical techniques in business & economics. USA: McGraw-Hill.<br>5. Santoso. 2004). Mengolah data statistik secara profesional. Jakarta: Elex Media Komputindo.<br>6. Sugiyono. (2003). Statistika untuk penelitian. Bandung: Alfabeta. |

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