

Environmental Spatial Analysis (KSH342)

Module designation	<i>Environmental Spatial Analysis (KSH342)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Prof. Dr. Ir. Lilik Budi Prasetyo, M.Sc.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University and elective course for other IPB University students</i>
Teaching methods	<i>Lecture session, discussion and practicum session</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p>Contact hour(s) (lecture session): 2 hours per week</p> <p>Contact hour(s) (practicum session): 3 hours per week</p> <p>Structured academic activities (doing in-class/take home assignment or homework): 2 hours per week</p> <p>Private in-depth study (literature reading): 2 hours per week</p>
Credit points	<i>3 SCH x 1.44 = 4.32 ECTS</i>
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> 1. <i>Students acquire ability to analyze the benefits and measure the potential of protected area, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism.</i> 2. <i>Students acquire ability to plan and design the management of protected area, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism.</i>
Course description	<p><i>This course is a mandatory subject offered by the Department of Forest Resources Conservation and Ecotourism. It covers a wide range of topics, including the understanding and utilization of spatial data in both vector and raster formats. The subject is divided into two parts, with the first part focusing on vector-based spatial data over in 7 weeks. These sessions cover various aspects such as comprehending vector data, developing vector data, conducting spatial data queries, performing simple spatial analysis (such as buffer, Euclidean distance, union, and clipping), and exploring real-life examples of vector spatial data applications in the environmental field. The second part of the course spans 7 weeks and is dedicated to raster-based spatial data. During this period, students will learn about the fundamental concepts of raster data, satellite image data acquisition, data pre-processing techniques, and the classification/interpretation of raster data. Additionally, the students will explore practical applications of raster data in the environmental field. The software tools employed in this course include ArcGIS and ERDAS Imagine.</i></p>

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Content	<p><i>This course is consisted of 8 topics, namely:</i></p> <ol style="list-style-type: none"> <li data-bbox="630 286 1412 577"> <p>1. Introduction <i>Students are expected to be able to understand the full picture of the course and the importance of understanding of environmental spatial analysis for the efforts to solve problems in forest resources conservation and ecotourism through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 584 1412 763"> <p>2. Concept of spatial data <i>Students are expected to be able to explain the definition of spatial data through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 770 1412 987"> <p>3. Spatial approach in environmental or landscape analysis <i>Students are expected to be able to understand the importance of spatial approach to solve environmental problems within a landscape or ecoregion through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 994 1412 1173"> <p>4. Spatial data formation <i>Students are expected to be able to understand Global Information System (GIS) software through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <li data-bbox="630 1180 1412 1429"> <p>5. Spatial data quality <i>Students are expected to be able to understand the accuracy of data produced with remote sensing and GIS through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 15% of the final score of this course.</i></p> <li data-bbox="630 1435 1412 1684"> <p>6. Spatial data analysis <i>Students are expected to be able to understand the composing of spatial rules in environmental or landscape analysis through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 15% of the final score of this course.</i></p> <li data-bbox="630 1691 1412 1908"> <p>7. Global Positioning System (GPS) <i>Students are expected to be able to understand the functions and working of GPS through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 15% of the final score of this course.</i></p> <li data-bbox="630 1915 1412 2132"> <p>8. Case study <i>Students are expected to be able to understand environmental spatial analysis in real terms through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for 20% of the final score of this course.</i></p>
Examination forms	<i>Written examination and practicum examination</i>

Module designation	<i>Environmental Spatial Analysis (KSH342)</i>
Study and examination requirements	<i>Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%</i>
Reading list	<ol style="list-style-type: none"> 1. Maguire, D. and M. F. Goodchild. 1991. <i>Geographical Information System: Principles and Application</i>. Longman Scientific and Technical. New York. 2. Goodchild, M. E., Steyaert, L. T. and B. O. Park. 1996. <i>GIS and Environmental Modelling</i>. GIS World Book. Fort Collins 3. Huxhold, W. E. and A.G. Levinsohn. 1995. <i>Managing Geographic Information System Projects</i>. Oxford Univ. Press. New York. 4. Young, R.H., Green, D. R. and S. Cousins. 1993. <i>Landscape Ecology and GIS</i>. Taylor and Francis. London. 5. Richards, J. A. 1993. <i>Remote Digital Image Analysis: An Introduction</i>. Springer Verlag. New York. 6. Frohn, R. C. 1998. <i>Remote Sensing for Landscape Ecology: New metric indicators for monitoring, Modelling and Assessment of Ecosystems</i>. Lewis Pub. Washington. 7. Ervin, S. M. and H. H. Hasbrouck. 2001. <i>Landscape Modelling</i>. McGraw Hill. New York. 8. Falero, E. M. and S. G. Alonso. 1995. <i>Quantitative Techniques in Landscape Planning</i>. Lewis Publisher. Boca Raton. 9. Sharifi, A. and M. van Herwijnen. 2003. <i>Spatial Decision Support System</i>. International Institute for Geo-Information Science and Earth Observation. 10. Tjalingi, S. P. and A. A. de Veer. 1982. <i>Perspectives in Landscape Ecology</i>. Wageningen. 11. Soule, M. E. 1986. <i>Conservation Biology: The science scarcity and diversity</i>. Sinauer Assoc. Inc. Publisher. 12. Bennet, A. F. 1999. <i>Linkages in the Landscape. The role of corridors and connectivity in the wildlife Conservation</i>. IUCN. 13. De Santo, R. S. 1978. <i>Concepts of applied Ecology</i>. Springer Verlag. 14. Farina, A. 2000. <i>Principles and Methods in Landscape Ecology</i>. Kluwer Academic Publisher. London. 15. Forman, R. T. T. 1995. <i>Land Mozaics: The Ecology of Landscape and Region</i>. Cambridge Univ. Press. Cambridge. 16. Forman, R. T. T. and M. Godron. 1986. <i>Landscape Ecology</i>. John Wiley & Sons. <p><i>Saunders, D.A., Hobbs, R. J. and P. R. Erlich. 1993. Reconstruction of Fragmented Ecosystem. In: Nature Conservation 3: Reconstruction of Fragmented Ecosystem. Surrey Beatty & Sons. Pp. 305-313</i></p>

Ethnobiology and Forest Bioprospection (KSH1332)

Module designation	<i>Ethnobiology and Forest Bioprospection (KSH1332)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Prof. Dr. Ir. Ervival A. M. Zuhud, M.S.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University and elective course for other IPB University students</i>
Teaching methods	<i>Lecture session and discussion</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p>Contact hour(s) (lecture session): 1 hour per week</p> <p>Structured academic activities (doing in-class/take home assignment or homework): 1 hourperweek</p> <p>Private in-depth study (literature reading): 1 hour per week</p>
Credit points	<i>2 SCH x 1.44 = 2.88 ECTS</i>
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <i>Students acquire ability to analyze the benefits and measure potential of wild animal and plant diversity based on local, traditional, or indigenous knowledge.</i> <i>Students acquire ability to formulate plan to conserve wild animal and plant diversity on local, traditional, or indigenous knowledge.</i>
Content	<p><i>This course is consisted of 12 topics, namely:</i></p> <ol style="list-style-type: none"> <i>Introduction, definition, history, and prospects of ethnobiology</i> <i>Students are expected to be able to explain the definition of ethnobiology and the objectives, scope, and interrelatedness between the discipline, history, and prospects of ethnobiology within forest conservation activities through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i> <i>Ethnobiology is a tangible manifestation of the principles of the uniqueness of the self-system in supporting food, medicine, and energy sovereignty</i> <i>Students are expected to be able to explain how ethnobiology is a tangible manifestation of the principles of the uniqueness of the self-system for the independence or sovereignty of the nation's people and at the same time a form of biodiversity conservation through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i> <i>Methods of ethnobiological study</i> <i>Students are expected to be able to explain and implement various</i>

Module designation	Ethnobiology and Forest Bioprospection (KSH1332)
	<p><i>methods of ethnobiological study through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>4. Ethnobotany of comestibles, plant products for energy, dyes, aromatics, poisons, decorations, and traditional or spiritual ceremonies</p> <p><i>Students are expected to be able to explain the traditional processing of plant species for various kinds of dyes, decorations, aromatics, poisons, traditional comestibles, and spices by giving examples of their usage in ethnic communities through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 15% of the final score of this course.</i></p> <p>5. Building community plantation forest based on traditional silviculture system and indigenous knowledge</p> <p><i>Students are expected to be able to understand and explain the concept of building community plantation forest based on traditional silviculture system and indigenous knowledge through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>6. Ethnobiology of medicinal plants (Ethnophytomedics)</p> <p><i>Students are expected to be able to explain the use of plants for treating various disease based on knowledge of particular ethnic communities through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>7. Ethnobiology of the traditional people of Baduy and Sunda Kasepuhan</p> <p><i>Students are expected to be able to explain the case of ethnobiology in traditional communities in Java through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>8. Indigenous knowledge in Indonesia's agroforestry system: Case study in Kalimantan and Sumatra</p> <p><i>Students are expected to be able to explain the examples of traditional agroforestry system in Indonesia through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>9. Types and functions of ethnic-based traditional home yard in Indonesia</p> <p><i>Students are expected to be able to explain the types and functions of the ethnic-based traditional home yard landscape in Indonesia through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>10. Ethnozoology in Indonesia</p> <p><i>Students are expected to be able to explain the examples of traditional knowledge of various ethnic communities in</i></p>

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	<p><i>Indonesia in utilizing animal diversity through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>11. Ethnobiology of traditional communities in Sumatra, Kalimantan, and Papua (case study)</p> <p><i>Students are expected to be able to explain the case study of Ethnobiology in the traditional people Sakai (Sumatra), Dayak Punan (Kalimantan), and Papua through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>12. Application of ethnobiological data and information for bio-cultural-diversity conservation to manifest nation's sovereignty with "Bhinneka Tunggal Ika"</p> <p><i>Students are expected to be able to explain the application of the concept of ethnobiology in bio-cultural-diversity conservation program to support the sustainable development with "Bhinneka Tunggal Ika" in Indonesia through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p>
Examination forms	Written examination
Study and examination requirements	Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%
Reading list	<ol style="list-style-type: none"> 1. Albuquerque, U. P., Romeu, R. and N. Alves (Eds). 2016. <i>Introduction to Ethnobiology</i>. Springer. 2. Aminah, Zuhud, E. A. M. and I. Z. Siregar. 2016. Utilization of Jelutung (<i>Dyera spp.</i>) among Anak Dalam Tribe in Bukit Duabelas National Park. <i>Media Konservasi: Jurnal Ilmiah Bidang Konservasi Sumberdaya Alam Hayati dan Lingkungan</i>. Vol 21, No. 2, August 2016: 168-173. 3. Anderson, E. N., Pearsall, D. M., Huwas, E. S. and N. J. Turner, 2011. <i>Ethnobiology</i>. Wiley-Black Well. London. 4. Hall, J. B., Tomlison, H.F., Oni, P. I., Buchy, M. and D. P. Aebischer. 1997. <i>Parkiabiglobosa</i>. A Monograph. School of Agricultural and Forest Science, University of Wales. Bangor, U.K. 5. Harefa, A. 2000. <i>Menjadi Manusia Pembelajar</i>. Penerbit Harian Kompas. Jakarta. 6. Harnov, Zuhud, E. A. M. and R. Soekmadi. 2016. <i>Konservasi Hutan Belajar dari Nilai-Nilai Etik dan Tradisi Bejernang Suku Anak Dalam di Taman Nasional Bukit Duabelas</i>. Provinsi Jambi. <i>Risalah Kebijakan Pertaniandan Lingkungan, Rumusan Kajian Strategis Bidang Pertanian dan Lingkungan</i>. Vol. 3 No. 1, April 2016: 24 - 38. 7. Harris, D. R. and G. C. Hillman (Editor). 1989. <i>Foraging and Farming. The Evolution of Plant Exploitation</i>. One World Archaeology. Unwin Hyman. London. 8. Helida, A., Zuhud, E. A. M., Hardjanto, Y., Purwanto, and A. Hikmat. 2015. <i>The Importance of Cultural Significance Index of Plants Diversity for The Communities Within the Kerinci Seblat National Park, Kerinci Regency, Province of Jambi</i>. <i>Berita Biologi</i>. Vol. 15 No. 1, April 2016: 7-15. 9. Helida, A., Ervival A.M. Zuhud; Hardjanto, Y., Purwanto, and A. Hikmat. 2015. <i>Analysis of Pelak Agroforestry System Using Tri Stimulus Amar Pro Conservation Concept at Kerinci Seblat National</i>

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	<p><i>Park. Proceeding: International Conference of Tropical Biology, SEAMEO BIOTROP, 12-13 October 2015. Published in November 2016.</i></p> <ol style="list-style-type: none"> 10. Helida, A., Zuhud, E. A. M., Hardjanto, Y., Purwanto, and A. Hikmat. 2016. Traditional Animals Knowledge of Kerinci Community in Sumatera, Indonesia. <i>International Journal of Sciences: Basic and Applied Research (IJSBAR)</i>. Vol. 24 No. 1: 227-242 11. Helida, A., Zuhud, E. A. M. Hardjanto, Y., Purwanto, and A. Hikmat. 2016. Makna Nilai Penting Budaya Keanekaragaman Hayati Tumbuhan bagi Masyarakat Kerinci di Kabupaten Kerinci. <i>Jurnal Berita Biologi LIPI 15 (1) April 2016 Edition</i>. 12. Iswandono, E., Zuhud, E. A. M., Hikmat, A. and N. Kosmaryandi. 2015. Traditional Land Practice and Forest Conservation: Case Study of The Manggarai Tribe in Ruteng Mountains, Indonesia. <i>Komunitas: International Journal of Indonesian Society and Culture</i>. Vol. 8 No. 2: 257-266. 13. Koentjaraningrat. 1974. <i>Kebudayaan, Mentalitet dan Pembangunan</i>. PT. Gramedia. Jakarta. 14. Koentjaraningrat, et al. 1993. <i>Masyarakat Terasingdi Indonesia</i>. PT Gramedia Pustaka Utama. Jakarta 15. Kloppenburgh-Veerteegh, J. 1983. <i>Petunjuk Lengkap Mengenai Tanaman-tanamandi Indonesiadan Khasiatnyasebagai Obat-obatan Tradisional</i>. Jilid I. Bagian Botani. Yayasan Dana Sejahtera dan CD. RS. Bethesda Yokyakarta. Translated by CD. R.S. Bethesda Yogyakarta. 16. Laksono, P. M., Tjahjono, P., Adi, M., Aprilla, B. H., Gunawan, and R. Transpiosa. 2001. <i>Kepulauan Padaido: Haruskah Habis Terkurus</i>. KEHATI, PSAP-UGM, RUMSRAM. Yogyakarta. 17. Martin, G. J. 1998. <i>Etnobotani. Natural History Publications (Borneo) and WWF. Kinibalu</i>. Translated by Maryati Mohamed 18. McNeely, J. A. and J. W. Thorsell. 1991. <i>Enhancingthe Role of Protected Areas in Conserving Medicinal Plants</i>. In: O. Akerele, V. Heywood and H. Synge (eds) <i>Conservationof Medicinal Plants</i>. Cambridge University Press. Cambridge. Pp. 213-228 19. Nataatmadja, H. 2003. <i>Intelegensi Spiritual</i>. Intuisi Press. Depok. 20. Parrotta, J. A. and R. L. Trosper (Eds). 2012. <i>Traditional Forest-Related Knowledge, Sustaining Communities, Ecosystems and Biocultural Diversity</i>. Publishedby John Wiley& Sons, Inc.,Hoboken, New Jersey Published simultaneously in Canada. 21. Pradityo, T., Santoso, N. and E. A. M. Zuhud. 2016. <i>Ethnobotanyin Dayak Iban’s Tembawang Sungai Mawang Village, West Kalimantan</i>. <i>Media Konservasi</i>. Vol 21, No. 2, August 2016: 183-198 22. Quedraogo, A-S. 1995. <i>Parkiabiglobosa (Leguminosae) en Afrique de l’Quest: Biosystematique et Amelioration</i>. Institut for Forestry and Nature Research IBN-DLO. Wageningen, The Netherlands. 23. Rachman A. M. A. 1991. <i>Social Integration and Energy Utilization</i>. In: <i>Profiles in Cultural Evolution</i> by A. Terry Rambo and Kathleen Gillogly. Ann Arbor, University of Michigan. USA. Pp. 311-331 24. Sangat, H. M., Zuhud, E. A. M. and E. K. Damayanti. 2000. <i>Kamus Penyakit dan Tumbuhan Obat Indonesia (Etnofitomedika)</i>. Yayasan Obor Indonesia. Jakarta. 25. Schumacher, E. F. 1973. <i>Kecil Itu Indah</i>. Yayasan Obor. Jakarta. 26. Sitorus, et al. 2004. <i>Potret Punan Kalimantan Timur</i>. CIFOR. Bogor. 27. Suparlan, P. 1995. <i>Orang Sakai di Riau. Masyarakat Terasing dalam Masyarakat Indonesia</i>. Yayasan Obor Indonesia. Jakarta. 28. Tadjudin, D. 2000. <i>Manajemen Kolaborasi</i>. Pustaka Latin. Bogor. 29. Metananda, A. A., Zuhud, E. A. M. and A. Hikmat. 2015. <i>Population, Distribution of Kepuh (Sterculia foetida L.) and its Association in Sumbawa Regency, West Nusa Tenggara</i>. <i>Media</i>

Module designation	<i>Ethnobiology and Forest Bioprospection (KSH1332)</i>
	<p><i>Konservasi</i>. Vol. 20 No. 3, December 2015: 277-287.</p> <p>30. Simanjuntak, R., Zuhud, E. A. M. and A. Hikmat. 2015. <i>The Ethnobotany of O Hongana Ma Nyawa Community in Wangongira Village, North Halmahera Regency</i>. <i>Media Konservasi</i>. Vol. 20 No. 3, December 2015: 252-260.</p> <p>31. Tanjungsari, R. J., Zuhud, E. A. M. and I. Z. Siregar. 2016. <i>Ecology and Population Potention Estimation of Jelutung (Dyera costulata (Miq) Hook.F) in Harapan Rainforest (HRF-PT REKI)</i>. <i>Media Konservasi</i>. Vol. 21 No. 1, April 2016: 1-8.</p> <p>32. Zikri, M., Hikmat, A. and E. A. M. Zuhud. 2016. <i>Retensi Pengetahuan Tumbuhan Pangan Suku Rejangdi Kampung Rindu Hati dalam Ketahanan Pangan</i>. <i>Media Konservasi: Jurnal Ilmiah Bidang Konservasi Sumberdaya Alam Hayati dan Lingkungan</i>. Vol 21, No. 3, December 2016: 270-277.</p> <p>33. Zuhud, E. A. M. 2016. <i>Nature Philosophy of Minangkabau Ethnic in West Sumatera, Indonesia</i>. In: <i>Traditional Knowledge for Ecosystem Services in ASEAN Countries - Folk Culture: Proverbs, Old Sayings and Community Rules</i>. 2-4 March, 2016. Kuala Lumpur, Malaysia. <i>Extended Abstracts</i>: 18-21. APAFRI, FRIM (Forest Research Institute Malaysia) and NIFOS.</p> <p>34. Zuhud, E. A. M., Kasno, Sari, R. K. and I. Kumara. 2016. <i>Pengembangan Madu Organik Hutan Tropika Indonesia: Suatu "Proses Pembelajaran"</i>. In: <i>Pengembangan Pertanian Organik di Indonesia, Pemikiran Guru Besar IPB</i>. IPB Press. Bogor. Pp. 325-360</p> <p>35. Zuhud, E. A. M. 2017. <i>Gerakan Kebangkitandan Pengembangan Desa-Kampung Konservasi Keanekaragaman Hayati Indonesia Untuk Mendukung Kedaulatan Pangan, Energi, dan Obat Keluarga dalam Menghadapai Ancaman Krisis Baru Ekonomi Dunia di Era Globalisasi</i>. In: <i>Kumpulan Naskah Orasi Ilmiah Guru Besar Institut Pertanian Bogor: Peningkatan Produksi, Manfaat, dan Sustainability Biodiversitas Tanaman Indonesia</i>. Vol. 2: 311-358.</p> <p>36. Zuhud, E. A. M., Helida, A. and E. Iswandono. 2017. <i>Indonesia Oral Tradition Collecting: Proverbs, Old Sayings and Community Rules of the Kerinci and Manggarai Communities</i>. In: <i>Collecting: Proverbs, Old Sayings and Community Rules related to Climate Change and Forest Management in ASEAN Countries</i>. APAFRI, Forest Research Institut Malaysia and National Institute of Forest Science (South Korea). Pp. 7-35</p>

Research Methodology and Scientific Writing (KSH1302)

Module designation	<i>Research Methodology and Scientific Writing (KSH1302)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Dr. Ir. Yeni A. Mulyani, M.Sc.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University</i>
Teaching methods	<i>Lecture session and discussion</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p><i>Contact hour(s) (lecture session): 1 hour per week</i></p> <p><i>Structured academic activities (doing in-class/take home assignment or homework): 1 hourperweek</i></p> <p><i>Private in-depth study (literature reading): 1 hour per week</i></p>
Credit points	<i>2 SCH x 1.44 = 2.88 ECTS</i>
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <i>1. Students acquire ability to analyze the benefits and measure the potential of protected area, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism.</i> <i>2. Students acquire ability to create scientific works.</i>
Course description	<i>This course provide students with understanding and skills in scientific writing and research methodoly. It provide students with the definition of scientific research, scientific ethics, critical thinking, critical reading, literature; identification, problem formulation and research objectives; literature; hypotheses and assumptions; review of research methodology in the exact and social fields; writing structure starting from the introduction, methods, results, discussion, conclusions, bibliography, and abstract; oral presentations and posters.</i>

Module designation	<i>Research Methodology and Scientific Writing (KSH1302)</i>
Content	<p><i>This course is consisted of 12 topics, namely:</i></p> <ol style="list-style-type: none"> <li data-bbox="630 286 1396 504"> <p>1. Introduction <i>Students are expected to be able to explain the definition of scientific research, research principles, ethics and norms in science, and plagiarism through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 510 1396 689"> <p>2. Scientific writing <i>Students are expected to be able to explain the types and criteria of scientific writing through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 696 1396 920"> <p>3. Variety of scientific research and stages in scientific research <i>Students are expected to be able to explain and exemplify the variety of scientific research and stages in scientific research through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 927 1396 1196"> <p>4. Identification and formulation of research problems <i>Students are expected to be able to explain the definition of research problems and steps in identification and formulation of research problems through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of identification and formulation which accounts for for 10% of the final score of this course.</i></p> <li data-bbox="630 1202 1396 1471"> <p>5. Bibliography <i>Students are expected to be able to explain the definition and importance of bibliography and procedures of citing and writing references and bibliography in scientific research and writing through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 1478 1396 1702"> <p>6. Research hypothesis, variables, and data <i>Students are expected to be able to explain and formulate research hypothesis and determine research variables and data through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="630 1709 1396 2022"> <p>7. Approach and techniques of data collection, processing, and analysis <i>Students are expected to be able to explain types of approach and techniques as well as the use of instruments in data collection and processing through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of instruments use which accounts for for 10% of the final score of this course.</i></p> <li data-bbox="630 2029 1396 2177"> <p>8. Illustration writing and language <i>Students are expected to be able to explain, distinguish, and write various forms of illustration writing as well as the proper and correct use of language in scientific writing through this topic.</i></p>

Module designation	<i>Research Methodology and Scientific Writing (KSH1302)</i>
	<p><i>Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of writing which accounts for for 10% of the final score of this course.</i></p> <p>9. Writing abstracts and summary of research results <i>Students are expected to be able to explain the definition of abstract and summary as well as to write the abstract and summary of some research result through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of writing which accounts for for 5% of the final score of this course.</i></p> <p>10. Writing research proposal <i>Students are expected to be able to explain the scope of some research proposal content and to write an example of research proposal through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of writing which accounts for for 10% of the final score of this course.</i></p> <p>11. Writing undergraduate thesis (report of research result) <i>Students are expected to be able to explain the objectives and importance of writing undergraduate thesis, to exhibit the scope of thesis content and thesis writing procedures through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of writing which accounts for for 15% of the final score of this course.</i></p> <p>12. Techniques of presenting research results <i>Students are expected to be able to explain the of presenting research results and writing presentation materials in the form of articles (handouts) and power points for oral presentation through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as communication skill and level in presenting research results which accounts for for 15% of the final score of this course</i></p>
Examination forms	<i>Written examination, presentations, individual report, group report, scientific paper analysis</i>
Study and examination requirements	<i>Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%</i>
Reading list	<ol style="list-style-type: none"> 1. Renck Jalongo, M., & Saracho, O. N. 2016. Writing for Publication. Springer International Publishing. https://doi.org/10.1007/978-3-319-31650-5 2. Blackwell J, Martin J. 2011. A Scientific Approach to Scientific Writing. Springer New York. 112 p. 3. Bassham, G., Irwin, W., Nardone, H., & Wallace, J. M. (Eds.). (2010). Critical thinking: A student's introduction (4th ed). McGraw-Hill Higher Education. 4. Moore BN, Parker R. 2007. Critical Thinking. Eight Edition. McGraw-Hill International edition. Boston. 5. [Tim Penulis IPB]. 2020. Pedomam Penulisan Karya Ilmiah IPB

Pollutions and Environmental Impact Control (KSH341)

Module designation	<i>Pollutions and Environmental Impact Control (KSH341)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Dr. Ir. Siti Badriyah Rushayati, M.Si.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University and elective course for other IPB University students</i>
Teaching methods	<i>Lecture session and discussion</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p>Contact hour(s) (lecture session): 1 hour per week</p> <p>Structured academic activities (doing in-class/take home assignment or homework): 1 hour per week</p> <p>Private in-depth study (literature reading): 1 hour per week</p>
Credit points	2 SCH x 1.44 = 2.88 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> 1. <i>Students acquire ability to understand the theoretical concept of living natural resources conservation and environmental pollutions.</i> 2. <i>Students acquire ability to elaborate and implement policies and regulations regarding environmental pollutions.</i> 3. <i>Students acquire ability to analyze and measure environmental pollutions.</i> 4. <i>Students acquire ability to solve environmental pollutions.</i>
Course description	
Content	<p><i>This course is consisted of 13 topics, namely:</i></p> <ol style="list-style-type: none"> 1. Definition, scope of study, and environmental problems <i>Students are expected to be able to explain environmental pollutions and environmental problems through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i> 2. Source, process, and impacts of air pollution toward plants, animals, and humans <i>Students are expected to be able to explain the source, process, and the impacts of air pollution toward plants, animals, and humans through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for 7% of the final score of this course.</i> 3. Impacts of air pollution toward environment <i>Students are expected to be able to explain Impacts of air pollution toward environment through this topic. Assessment indicator for</i>

Module designation	Pollutions and Environmental Impact Control (KSH341)
	<p><i>this topic is the completeness and correctness of explanation which accounts for for 16% of the final score of this course.</i></p> <p>3. Air pollution control and countermeasure <i>Students are expected to be able to explain and implement the air pollution control and countermeasure through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i></p> <p>4. Source, process, and negative impacts of water pollution <i>Students are expected to be able to explain the source, process, and negative impacts of water pollution through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i></p> <p>5. Source, impacts, anticipation, and countermeasures of detergent waste <i>Students are expected to be able to explain the pollution caused by detergent waste through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i></p> <p>6. Source, impacts, anticipation, and countermeasures of oil pollution <i>Students are expected to be able to explain the oil pollution through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts forfor 7% of the final score of this course.</i></p> <p>7. Source, impacts, and management of toxic and hazardous waste <i>Students are expected to be able to explain the toxic and hazardous waste through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i></p> <p>8. Assessment, monitoring, and control of water pollution <i>Students are expected to be able to explain and implement the assessment, monitoring, and control of water pollution through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i></p> <p>9. Policy and legislation concerning the management of aquatic environment <i>Students are expected to be able to explain policy and legislation concerning the management of aquatic environment through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i></p> <p>11. Source, impacts, and management of solid waste <i>Students are expected to be able to explain the source, impacts, and management of solid waste through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</i></p> <p>12. Source, process, negative impacts, and countermeasures of ground pollution</p>

Module designation	<i>Pollutions and Environmental Impact Control (KSH341)</i>
	<p>Students are expected to be able to explain the source, process, negative impacts, and countermeasures of ground pollution through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</p> <p>13. Controlling and improving environment quality (ground, water, and air)</p> <p>Students are expected to be able to explain the environmental pollutions (ground, water, and air) and implement the control and improvement of environment quality through this topic.</p> <p>Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 7% of the final score of this course.</p>
Examination forms	Written examination
Study and examination requirements	Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%
Reading list	<ol style="list-style-type: none"> 1. Abel PD. 1989. <i>Water Pollution Biology</i>. Ellis Horwood Ltd. Chicheste, England. 2. Carson R. 1962. <i>Silent Spring</i>. New York: Houghton Mifflin Company. 3. Connely DW, Miller GJ. 1995. <i>Kimia dan Ekotoksikologi Pencemaran</i>. Penerbit Universitas Indonesia. Jakarta 4. Darmono. 2001. <i>Lingkungan Hidup dan Pencemaran Lingkungan</i>. Penerbit Universitas Indonesia. Jakarta. 5. ECIFM, 2019. <i>Agricultural Contribution to Environmental Degradation. Subject 3</i>. The University of Reading, UK. http://www.ecifm.rdg.ac.uk/subject3.htm 6. FAO, 2019. <i>Innovative actions towards a pollution free-planet: Implementing the UNEA-3 resolution on soil pollution</i>. (http://web.unep.org/environmentassembly/innovative-actions-towards-pollution-free-planet-implementing-unea-3-resolution-soil-pollution) 7. Irwan ZD. 2008. <i>Tantangan Lingkungan dan Lansekap Hutan Kota</i>. PT. Bumi Aksara. Jakarta 8. Monteith J.L. 1975. <i>Vegetation and the Atmosphere</i>. Academic Press INC. London. 9. Murdiyarso D and Tsuruta H. 2000. <i>The Impact of land use/cover change on greenhouse gas emissions in Tropical Asia</i>. <i>Global Change Impacts Centre for Southeast Asia (IC-SEA)</i>. BogOr, Indonesia. 10. Murdiyarso D. 2003. <i>Sepuluh Tahun Perjalanan Negosiasi Konvensi Perubahan Iklim</i>. PT Kompas Media Nusantara. Jakarta. 11. Murtadho, Said EG. 1988. <i>Penanganan dan Pemanfaatan Limbah Padat</i>. PT. Mediyatama Sarana Perkasa. Jakarta. 12. Pandey GN and Caarney GC. 1991. <i>Environmental Engineering</i>. Tata McGraw-Hill Publishing Company Limited. New Delhi. 13. [PP] Peraturan Pemerintah RI. No, 74 tahun 2001 tentang <i>Pengelolaan Bahan Berbahaya dan Beracun</i>. 2001. 14. [PP]. Peraturan Pemerintah RI No. 101 tahun 2014 tentang <i>Pengelolaan Limbah Bahan Berbahaya dan Beracun</i>. 2014. 15. Rukaesih A. 2004. <i>Kimia lingkungan</i>. Penerbit Universitas Negeri Jakarta. Jakarta. 16. Saeni MS. 1989. <i>Kimia Lingkungan</i>. Departemen Pendidikan dan Kebudayaan, Direktorat Jenderal Pendidikan Tinggi. Indonesia. 17. Stoytcheva M (ed.) 2011. <i>Pesticides in the Modern World - Pests Control and Pesticides Exposure and Toxicity Assessment</i>. InTech. 18. Wiedmann T, Barrett J. 2010. <i>A Review of the Ecological Footprint Indicator—Perceptions and Methods</i>. Sustainability

Module designation	<i>Pollutions and Environmental Impact Control (KSH341)</i>
	<p>2: 1645–1693.</p> <p>19. <i>Yasman I, Banowati L, Lasmini, Septiani Y. 2009. Peluang Pemanfaatan Potensi Karbon Hutan dalam Isu Perubahan Iklim. Yayasan Resource Development Center. Jakarta.</i></p> <p>20. <i>Yasman I, Banowati L, Lasmini, Septiani Y. 2009. Peluang Pemanfaatan Potensi Karbon Hutan dalam Isu Perubahan Iklim. Yayasan Resource Development Center. Jakarta.</i></p>

Wild Animal Behavior (KSH1314)

Module designation	<i>Wild Animal Behavior (KSH1314)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Ir. Dones Rinaldi, M.Sc.F.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University</i>
Teaching methods	<i>Lecture session and discussion</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p><i>Contact hour(s) (lecture session): 1 hour per week</i></p> <p><i>Structured academic activities (doing in-class/take home assignment or homework): 1 hour per week</i></p> <p><i>Private in-depth study (literature reading): 1 hour per week</i></p>
Credit points	<i>2 SCH x 1.44 = 2.88 ECTS</i>
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <i>1. Students acquire ability to analyze roles of wildlife and measure wildlife potential.</i> <i>2. Students acquire ability to plan wildlife management.</i> <i>3. Students acquire ability to manage the utilization of wildlife.</i> <i>4. Students acquire ability to preserve genetic resources and germplasm of living natural resources.</i>
Course description	<p><i>This course reviews the history of the development of wildlife behavior science, the urgency of animal behavior science in the application of wildlife management; animal behavior development; basic mechanism of animal behavior; motivation and learning processes, classification and behavior patterns in wildlife; communication behavior, social and reproductive behavior, home range, territory, migration and spatial orientation; and an introduction to animal behavior research methods. In applying wildlife-based ecotourism development, this course provides the basics of observing wildlife that can be applied in developing tourism activities such as bird watching, sport hunting, etc. Furthermore, this course also provides the basics of understanding animal behavior that can be applied in efforts to reduce and mitigate conflicts between communities and wild animals.</i></p>

Module designation	<i>Wild Animal Behavior (KSH1314)</i>
Content	<p><i>This course is consisted of 10 topics, namely:</i></p> <ol style="list-style-type: none"> <li data-bbox="632 286 1418 539"> <p>1. Introduction <i>Students are expected to be able to explain the purpose and objectives as well as benefits of learning wildlife behavior and the scope and interrelatedness of wildlife ethology with other field of knowledge through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="632 551 1418 759"> <p>2. The history and development of wildlife ethology <i>Students are expected to be able to explain the history and development of wildlife ethology through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="632 770 1418 1010"> <p>3. Wildlife behavior development <i>Students are expected to be able to explain wildlife behavior development stages such as pre-natal and post-natal, early experience, and factors that influence them through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="632 1021 1418 1229"> <p>4. The basic mechanism of animal behavior <i>Students are expected to be able to explain the principles and basis for behavior in animals through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <li data-bbox="632 1240 1418 1449"> <p>5. Motivation and learning process <i>Students are expected to be able to understand and explain behavioral motivation and learning process in animals through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <li data-bbox="632 1460 1418 1668"> <p>6. Behavior classification and pattern <i>Students are expected to be able to explain animal behavior classification and important behaviors for species conservation through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="632 1680 1418 1861"> <p>7. Communication behavior <i>Students are expected to be able to explain communication behavior in animals through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <li data-bbox="632 1872 1418 2080"> <p>8. Social and reproduction behavior <i>Students are expected to be able to explain social and reproduction behavior in animals through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <li data-bbox="632 2092 1418 2172"> <p>9. Home rage, territory, migration, and spatial orientation <i>Students are expected to be able to explain home rage, territory, migration, and orientation in animals through this topic.</i></p>

Module designation	<i>Wild Animal Behavior (KSH1314)</i>
	<p><i>Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>10. Introduction to animal behavior research methods</p> <p><i>Students are expected to be able to explain methods of research and data analysis in animal behavior research through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 40% of the final score of this course.</i></p>
Examination forms	<i>Written examination</i>
Study and examination requirements	<i>Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%</i>
Reading list	<ol style="list-style-type: none"> 1. <i>Barnard, C. J. 1983. Animal Behavior: Ecology and Evolution. Wiley-Interscience Publication, John Wiley & Sons. New York.</i> 2. <i>Kamil, T. W. 1983. Perilaku Binatang. (Translated from Animabal Behavior by Niko Tinbergen). Tira Pustaka. Jakarta.</i> 3. <i>Lehner, P. N. 1979. Handbook of Ethological Methods. Garland STPM Press. New York and London.</i> 4. <i>Slater, P. and R. M. Alexander (Eds). 1986. The Encyclopaedia of Animal Behavior and Biology. Equinox (Oxford) Ltd. Oxford.</i> 5. <i>Suratmo, F. G. 1979. Prinsip Dasar Tingkah Laku Satwa Liar. School of Environmental Conservationmanagement (ATA-190). Bogor.</i> 6. <i>Poole, T. B. 1985. Social Behavior in Mammals. Blackie & Sons Limited. Glasgow.</i>

Nature and Environment Interpretation (KSH1353)

Module designation	<i>Nature and Environment Interpretation (KSH1353)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Prof. Dr. E. K. S. Harini Muntasib, M.S.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University and elective course for other IPB University students</i>
Teaching methods	<i>Lecture session and discussion</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p>Contact hour(s) (lecture session): 1 hour per week</p> <p>Structured academic activities (doing in-class/take home assignment or homework): 1 hour per week</p> <p>Private in-depth study (literature reading): 1 hour per week</p>
Credit points	<i>2 SCH x 1.44 = 2.88 ECTS</i>
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> 1. <i>Students acquire ability to understand the theoretical concept of nature interpretation.</i> 2. <i>Students acquire ability to analyze benefits and measure the potential of living resources and their ecosystem</i> 3. <i>Students acquire ability to plan the management of nature interpretation.</i>
Course description	
Content	<p><i>This course is consisted of 12 topics, namely:</i></p> <ol style="list-style-type: none"> 1. Introduction to interpretation <i>Students are expected to be able to explain the nature interpretation through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i> 2. Interpretation objects and paths <i>Students are expected to be able to explain the interpretation objects and paths through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i> 3. Types of interpretation <i>Students are expected to be able to explain the types of interpretation through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for 5% of the final score of this course.</i> 4. Interpretation program

Module designation	Nature and Environment Interpretation (KSH1353)
	<p><i>Students are expected to be able to explain the interpretation program through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>4. Interpretation themes <i>Students are expected to be able to explain the interpretation themes through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>5. Characteristics and behaviors of visitors <i>Students are expected to be able to explain the characteristics and behaviors of visitors through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>6. Communication in interpretation <i>Students are expected to be able to explain the communication in interpretation through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as communication skill which accounts for for 10% of the final score of this course.</i></p> <p>7. Interpretation techniques <i>Students are expected to be able to explain the interpretation techniques through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skills in implementing interpretation techniques which accounts for for 15% of the final score of this course.</i></p> <p>8. Interpretation planning <i>Students are expected to be able to explain the interpretation planning through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 15% of the final score of this course.</i></p> <p>9. Ethics and techniques of tourist guiding <i>Students are expected to be able to explain the ethics and techniques of tourist guiding through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>10. Interpretation media and examples of its application <i>Students are expected to be able to explain the interpretation media and examples of its application through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 15% of the final score of this course.</i></p> <p>11. Signs and labels for interpretation <i>Students are expected to be able to explain and make signs and labels for interpretation through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 10% of the final score of this course.</i></p>

Module designation	<i>Nature and Environment Interpretation (KSH1353)</i>
Examination forms	<i>Written examination</i>
Study and examination requirements	<i>Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%</i>
Reading list	<ol style="list-style-type: none"> 1. <i>Muntasib, E. K. S. H. 2003. Interpretasi Wisata Alam. Laboratorium Rekreasi alam, DKSH Fahutan IPB. Bogor.</i> 2. <i>Mackintosh, B. 1986. Interpretation in The National Park Service: A Historical Perspective. History Division, National Park Service Department of The Interior. Washigton, D. C.</i> 3. <i>Sharpe, G. W. 1982. Interpreting the Environment. John Wiley & Sons.</i> 4. <i>Ham, S. H. 1992. Environmental Interpretation: Practicum Guide for People with Big Ideas and Small Budgets. North American Press. Colorado.</i> 5. <i>Everhart, W. C. 1973. A Report on National Park Service Interpretation.</i> 6. <i>Berkmuller, K. Guidelines and Techniques for Environmental Interpretation. The Netherlands Foundation for International Nature Protection.</i> 7. <i>Lucas, P. H. C. 1970. Conserving New Zealand's Heritage.</i> 8. <i>Harris, S. Guidelines for Site Interpretation Planning.</i> 9. <i>Domroese, M. C. and E. J. Sterling. 1999. Interpreting Biodiversity: A Manual for Environmental Educators in The Tropics. American Museum of Natural History.</i> 10. <i>Tilden, F. 1957. Interpreting Our Heritage: Principles and Practices for Visitor Services in Parks, Museum and Historic Places. Chapel Hill. The University of North Carolina Press.</i>

Environmental Services (KSH1344)

Module designation	<i>Environmental Services (KSH1344)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Ir. Agus Priyono, M.Si</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University and elective course for other IPB University students</i>
Teaching methods	<i>Lecture session, discussion and practicum session</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p>Contact hour(s) (lecture session): 1 hour per week</p> <p>Structured academic activities (doing in-class/take home assignment or homework): 1 hour per week</p> <p>Private in-depth study (literature reading): 1 hour per week</p>
Credit points	$2 \text{ SCH} \times 1.44 = 2.88 \text{ ECTS}$
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> 1. <i>Students acquire ability to understand the theoretical concept of environmental services and impact control.</i> 2. <i>Students acquire ability to elaborate and implement policies and regulations in the field of environment.</i> 3. <i>Students acquire ability to analyze benefits and measure environmental services and impact control.</i> 4. <i>Students acquire ability to manage the utilization environmental services.</i>
Course description	
Content	<p><i>This course is consisted of 11 topics, namely:</i></p> <ol style="list-style-type: none"> <p>1. Introduction</p> <p><i>Students are expected to be able to explain the definition of environmental services and impact control, to identify environmental services and possible negative impact and hazard control through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for 5% of the final score of this course.</i></p> <p>2. Roles of watershed ecosystem and its damage issues</p> <p><i>Students are expected to be able to explain the management of watershed and source, type, and process of impact occurrence through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for 10% of the final score of this course.</i></p> <p>3. Potential of aquatic ecosystem and environmental services</p> <p><i>Students are expected to be able to explain aquatic environmental</i></p>

Module designation	Environmental Services (KSH1344)
	<p><i>services and the impacts of the utilization of aquatic ecosystem through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>4. Potential of mangrove ecosystem and environmental services <i>Students are expected to be able to explain mangrove environmental services and the impacts of the utilization of mangrove ecosystem through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 15% of the final score of this course.</i></p> <p>5. Potential of forest ecosystem and environmental services <i>Students are expected to be able to explain forest environmental services and the impacts of the utilization of forest ecosystem through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 15% of the final score of this course.</i></p> <p>6. Roles of forest in hydrological function <i>Students are expected to be able to explain forest environmental services in hydrological system and the impact of the utilization of forest ecosystem on the occurrence of floods and landslides through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>7. Roles of air in the concept of environmental services <i>Students are expected to be able to explain environmental services of air and the impact of air pollution through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>8. Concept of environmental services in climate maintenance <i>Students are expected to be able to explain environmental services in its relation with climate maintenance through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>9. Environmental impact analysis and <i>Students are expected to be able to explain the roles of environmental impact analysis in environmental impact control through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for 5% of the final score of this course.</i></p> <p>10. Management and control of ecotourism impacts within environmental management system <i>Students are expected to be able to explain and implement the management and control of impacts as part of environmental management system through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i></p> <p>11. Definition of Payment for Environmental Services (PES), stakeholder identification, and mechanism of PES <i>Students are expected to be able to explain implement the management of PES through this topic. Assessment indicator for this topic is the</i></p>

Module designation	<i>Environmental Services (KSH1344)</i>
	<i>completeness and correctness of explanation which accounts for for 10% of the final score of this course.</i>
Examination forms	<i>Written examination</i>
Study and examination requirements	<i>Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%</i>
Reading list	<ol style="list-style-type: none"> 1. Alikodra, H. S. 2004. <i>Bumi makin Panasbanjir makin Luas: menyibak tragedi kehancuranhutan</i>. Yayasan Nuansa Cendekia. Bandung. 2. Andrianto, T. T. 2002. <i>Audit Lingkungan</i>. Global Pustaka Utama. Yogyakarta. 3. Arsyad, S. 1989. <i>Konservasi Tanah dan Air</i>. IPB Press. Bogor. 4. Asmoro, P. B. 1995. <i>Panduan Patroli di Lahan Basah</i>. Direktorat Jenderal Perlindungan Hutan dan Pelestarian Alam dan Asian Wetland Bureau. Jakarta. 5. Bell, J. N. B. and M. Treshow. 2002. <i>Air Pollution and Plant Life</i>. John Wiley & Sons LTD. 6. Connell, D. W. and Gregory J. M. 1995. <i>Kimia dan Ekotoksikologi Pencemaran</i>. Penerbit Universitas Indonesia. Jakarta. 7. Darmono. 1995. <i>Logam dalam Sistem Biologi Makhluk Hidup</i>. UI-Press. Jakarta. 8. Darmono. 2001. <i>Lingkungan Hidupdan Pencemaran: hubungannya dengan toksikologi senyawa logam</i>. UI-Press. Jakarta. 9. Fardiaz, S. 1992. <i>Polusi Air dan Polusi Udara</i>. Departemen Pendidikan dan Kebudayaan, Direktorat Jenderal Pendidikan Tinggi, Pusat Antar Universitas Pangan dan Gizi, Institut Pertanian Bogor. Bogor. 10. Foley, G. 1993. <i>Pemanasan Global: Siapakahyang Merasa Panas?</i> Yayasan Obor Indonesia, Konphalindo, PANOS. Jakarta. 11. Mansfield, T. A. 1976. <i>Effects of Air Pollutants on Plants</i>. Cambridge University Press. London. 12. Maryono, A. 2002. <i>Eko-Hidraulik Pembangunan Sungai: Menanggulangi Banjir dan Kerusakan Lingkungan Wilayah Sungai</i>. Program Magister Sistem Teknik, Fakultas Teknik, Universitas Gadjah Mada. Yogyakarta. 13. Murdiyarto, D. 2003. <i>CDM: Mekanisme Pembangunan Bersih</i>. Penerbit Buku Kompas. Jakarta. 14. Murtadho, D. and E. G. Sa'id. 1988. <i>Penanganan dan Pemanfaatan Limbah Padat</i>. Mediatama Sarana Perkasa. Jakarta. 15. Salim, E. 1986. <i>Pembangunan Berwawasan Lingkungan</i>. PT.Pustaka LP3ES Indonesia. Jakarta. 16. Soedomo, M. 2001. <i>Pencemaran Udara</i>. Penerbit ITB Bandung. Bandung. 17. Soemarwoto, O. 2001. <i>Atur Diri Sendiri: Paradigma Baru Pengelolaan lingkungan Hidup (Pembangunanramahlingkungan, berpihak padarakyat, ekonomi berkelanjutan)</i>. Gadjah Mada University Press. Yogyakarta. 18. Suratmo, F. G. 1993. <i>Analisis mengenai Dampak Lingkungan</i>. Gadjah Mada University Press. Yogyakarta. 19. Yasman I, Banowati L, Lasmini, Septiani Y. 2009. <i>Peluang Pemanfaatan Potensi Karbon Hutan dalam Isu Perubahan Iklim</i>. Yayasan Resource Development Center. Jakarta. 20. Yasman I, Banowati L, Lasmini, Septiani Y. 2009. <i>Peluang Pemanfaatan Potensi Karbon Hutan dalam Isu Perubahan Iklim</i>. Yayasan Resource Development Center. Jakarta.

Protected Areas and Essential Ecosystems (KSH1323)

Module designation	<i>Protected Areas and Essential Ecosystems (KSH1323)</i>
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Prof. Dr. Ir. Sambas Basuni, M.S.</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory course for students of Department of Forest Resources Conservation and Ecotourism IPB University and elective course for other IPB University students</i>
Teaching methods	<i>Lecture session and discussion</i>
Teaching media and tools	<i>Powerpoint, textbooks, videos, films, drone, laboratory equipments (example: PPE (Protective Personal Equipment), drone, microscope, etc.)</i>
Workload	<p><u>Total Workload</u></p> <p><i>Contact hour(s) (lecture session): 1 hour per week</i></p> <p><i>Structured academic activities (doing in-class/take home assignment or homework): 1 hourperweek</i></p> <p><i>Private in-depth study (literature reading): 1 hour per week</i></p>
Credit points	<i>2 SCH x 1.44 = 2.88 ECTS</i>
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> <i>1. Students acquire ability to analyze and measure the potential utilization of protected area, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism.</i> <i>2. Students acquire ability to plan and design the management of protected area within the context of landscape, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism.</i> <i>3. Students acquire ability to manage the utilization of protected area, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism sustainably.</i> <i>4. Students acquire ability to mobilize resources in the management of protected area, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism.</i> <i>5. Students acquire ability to manage conflicts.</i> <i>6. Students acquire ability to implement interdisciplinary approach in the management of protected area, wild animal, plant diversity, ecosystem services, nature recreation, and ecotourism.</i>
Course description	<i>Definition and objectives of Protected Area management; Protected Area management perspective; category of Protected Area; basic principles of Protected Area management; selection of Protected Area locations; Protected Area planning; area management approach: participation and collaboration; buffer area management; evaluation of the effectiveness of area management.</i>
Contents	<i>This course is consisted of 11 topics, namely:</i>

Module designation	Protected Areas and Essential Ecosystems (KSH1323)
	<p>1. Introduction <i>Students are expected to be able to correctly explain the definition and scope of protected area management as well as the objectives and targets of protected area management through this topic.</i> <i>Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>2. History of protected area establishment <i>Students are expected to be able to explain history of protected area establishment in Indonesia and abroad through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>3. Protected area management perspectives <i>Students are expected to be able to explain the motivation, values, and benefits of protected area toward life as well as the position of protected area management in national and regional development through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>4. Categories of protected area <i>Students are expected to be able to explain the categories of protected area based on its management objectives through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>5. Basic principles of protected area management <i>Students are expected to be able to explain the basic principles of protected area management with consideration of ecology integrity through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>6. Selection for protected area location <i>Students are expected to be able to identify the basic principles of selecting location or sites for protected area with consideration for characteristics of biogeography, biodiversity, migrant species, hydrological and socio-political function, and potential utilization of the area for tourism through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>7. Protected Area planning <i>Students are expected to be able to explain the basics of protected area planning which covers feasibility study, management plan, operational plan, and area zonation system through this topic.</i> <i>Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 5% of the final score of this course.</i></p> <p>8. Protected area with distinctive ecosystem and values <i>Students are expected to be able to explain and analyze</i></p>

Module designation	Protected Areas and Essential Ecosystems (KSH1323)
	<p>discrepancy between the theory of protected area management and the management of protected area management with distinctive ecosystem and values through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</p> <p>9. Implementation of protected area management: Participatory and collaborative approach Students are expected to be able to explain the basic principles of protected area management and the important aspects that should be considered in area management through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 15% of the final score of this course.</p> <p>10. Protected area buffer zone Students are expected to be able to explain the concept of protected area management development concept through this topic. Assessment indicator for this topic is the completeness and correctness of explanation which accounts for for 10% of the final score of this course.</p> <p>11. Management effectiveness evaluation Students are expected to be able to analyze the effectiveness of protected area management using objective evaluation instruments through this topic. Assessment indicator for this topic is the completeness and correctness of explanation as well as skill and correctness of analysis which accounts for for 15% of the final score of this course.</p>
Examination forms	Written examination
Study and examination requirements	Acquire a final score that qualifies for letter grade D at the minimum; Mid-semester Examination : 30%, Final-semester Examination : 30%, Assessment method : 25%, Online Study : 15%
Reading list	<ol style="list-style-type: none"> 1. Alexander, M. 1995. Management Planning in relation to Protected Areas. Protected Areas Programme. PARKS (Parks and Information Technology). Vol. 5 No. 1, February 1995: 2-11. 2. Amend, S. and T. Amend (Eds). 1995. National Parks without People? The South American Experience. IUCN-The World Conservation Union, Gland, Switzerland. 3. Barborak, J. R. 1995. Institutional Options for Managing Protected Areas. (in Expanding Partnerships in Conservation edited by Jeffrey A. McNeely). Island Press, Washington, D.C. Pp. 30-38 4. 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). IUCN-The World Conservation Union, Eartscan Publications Ltd, London. Pp. 224-234. 5. Brandon, K. E. and M. Wells. 1992. Planning for People and Parks: Design Dilemmas. Journal World Development Vol. 20 No. 4. Pergamon Press Ltd., Great Britain. Pp. 557-570 6. Bruner, A. G., Gullison, R. E., Rice, R. E. and G. A.B. da Fonseca. 2001. Effectiveness of Parks in Protecting Tropical Biodiversity. Science Magazine Vol. 291 No. 5501, Issue of

Module designation	Protected Areas and Essential Ecosystems (KSH1323)
	<p>5 January 2001. <i>The American Association of the Advancement of Science</i>. Pp:125-128; http://www.sciencemag.org/cgi/content/full/291/5501/125 date of download: 20.02.01</p> <ol style="list-style-type: none"> 7. Dower, M. 1995. <i>Working with People Who Live in Protected Areas</i> in McNeely, Jeffrey A. (Ed.), <i>Expanding Partnerships in Conservation</i>. IUCN-The World Conservation Union, Gland- Switzerland. Pp. 215-222 8. Hess Jr., K. 2001. <i>Parks Are for People – But Which People? in The Politics and Economics of Park Management</i>, Edited by Terry L. Anderson and Alexander James. Rowman and Littlefield Publisher, Oxford. Pp. 159-181 9. Hockings, M. and A. Phillips. 1999. <i>How well are we doing? – some thoughts on the effectiveness of protected areas. PARKS – Protected Areas Programme Vol. 9 No. 2 June 1999</i>. IUCN-The World Conservation Union, Gland, Switzerland. 10. IUCN. 1992. <i>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</i>, IUCN The World Conservation Union, Gland, Switzerland. 11. IUCN The World Conservation Union. 1994. <i>Guidelines for Protected Area Management Categories</i>. IUCN Commission on National Parks and Protected Areas (CNPPA) – World Conservation Monitoring Centre (WCMC), Gland- Switzerland and Cambridge-UK. 12. Lewis, C. (Ed.). 1996. <i>Managing Conflicts in Protected Areas</i>. IUCN The World Conservation Union, Gland-Switzerland. 13. MacKinnon, J., K. MacKinnon, Child, G and J. Thorsell. 1986. <i>Managing Protected Areas in the Tropics</i>, International Union for Conservation of Nature and Natural Resources (IUCN). Gland- Switzerland. 14. McNeely, J. A. and J. Thorsell. 1991. <i>Guidelines for Preparing Protected Area System Plans</i>. PARKS the international magazine dedicated to the protected areas of the world. Vol. 2 No. 2, July 1991 (System Planning): 4-8. 15. McNeely, J. A. (Ed.). 1995. <i>Expanding Partnerships in Conservation</i>. IUCN, Island Press, Washington DC. 16. McNeely, J. A. 1999a. <i>Mobilizing Broader Support for Asia's Biodiversity: How Civil Society Can Contribute to Protected Area Management</i>. Asian Development Bank – The World Conservation Union, Manila, the Philippines. 17. Meganck, R. A., and R. E Saunier. (Eds.). 1995. <i>Conservation of Biodiversity and the New Regional planning</i>. 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. 18. Sayer, J. 1991. <i>Buffer Zones in Rainforest: Fact or Fantasy?.</i> PARKS the international magazine dedicated to the

Module designation	Protected Areas and Essential Ecosystems (KSH1323)
	<p><i>protected areas of the world. Vol. 2 No. 2, July 1991 (System Planning): 20-24.</i></p> <p>19. Soekmadi, R. 2002. <i>National Park Management in Indonesia: Focused on Decentralization and Local Participation.</i> Cuvilier Verlag. Göttingen, Germany.</p> <p>20. UNDP/FAO National Park Development Project. 1982. <i>Rencana Konservasi Nasional Jilid I: Pendahuluan, Metoda Evaluasi dan Tinjauan Kekayaan Alam (berdasarkan karya John MacKinnin-FAO).</i></p> <p>21. Wells, M. and K. E. Brandon (with Lee Hannah). 1995. <i>People and Parks: Linking Protected Area Management with Local Communities (3rd Ed.).</i> The World Bank, WWF, and USAID, Washington, D.C.</p> <p>22. Westley, F., Seal, U., Byers, O. and G. D. Ness. <i>People and Habitat Protection. PARKS Protected Areas Programme (the International Journal for Protected Area Managers Vol. 8 No 1. February 1998).</i> IUCN – The Conservation Union, Cambridge – UK. Pp. 15-26</p> <p>23. Walkey, M; Swingland, I and Russel, S. 1999. <i>Integrated protected area management.</i> London: Kluwer Academic Publisher</p> <p>24. Basuni, S. 2023. <i>Kebijakan, Dasar-dasar Teoritis, dan Metode Evaluasi Keseusian Fungsi Kawasan Hutan Konservasi.</i> Bogor: IPB Press</p> <p>25. <i>Pemerintah Republik Indonesia. 2021. Peraturan Menteri Lingkungan Hidup Dan Kehutanan Republik Indonesia Nomor 7 Tahun 2021 Tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan Dan Perubahan Fungsi Kawasan Hutan, Serta Penggunaan Kawasan Hutan</i></p> <p>IUCN. 1994. <i>Guidelines for Protected Area Management Categories</i></p>