Module Handbook

Mangrove Ecology

REG

By:

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SEMESTER LEARNING PLAN

A. Identitas Matakuliah / *Course Detail*

1.	Nama Matakuliah / *Course Name*	:	Mangrove Ecology
2.	Kode/SKS/Sifat / *Code/Credits/Status*	:	KTK 634/2/Pilihan (Elective)
3.	Prasyarat / *Prerequisite*	:	-
4.	Deskripsi Singkat / *Short Description*	:	Mangrove Ecology is an elective graduate course in the Forestry Science Study Program, Faculty of Forestry UGM. This course is a specification of aquatic ecology given in S1 and S2. The emergence of this course stems from the condition of mangrove forests in Indonesia, which are increasingly degraded and require serious attention. This course studies mangrove ecosystems, including the introduction of species, habitats, and factors that affect them, material and energy cycles as well as mangrove silviculture and rehabilitation. By studying mangrove ecology, students are expected to understand the ecosystem to reduce degradation with better management. The course curriculum is delivered through a combination of classroom lectures, engaging discussions on current mangrove-related topics, and assignments. The assessment process encompasses evaluations conducted at various points throughout the semester, including mid-term assessments, end-of-semester examinations, and the consideration of average weekly grades.
5.	Tujuan Pembelajaran / *Learning Objective*	:	After completing this course, students will have the ability to explain and understand the mangrove ecosystem, its constituent components, habitats, influencing factors, material and energy cycles, productivity, and rehabilitation methods. This equips them to mitigate degradation and work towards achieving the preservation goals of mangrove areas.
6.	Dosen Pengampu Matakuliah / *Lecturers*	:	Erny Poedjirahajoe,MP
7.	Capaian Pembelajaran Matakuliah / *Course Learning Outcome (CPMK/CLO)*	:	

Kode / *Code*	Deskripsi / *Description*	PLO/SO/ELO/CPL/LG
CLO 1	1. Students are able to explain the mangrove ecosystem, its material and energy cycles within it, and environmental factors including habitats, constituent types, and methods for rehabilitating the area.	PLO 6
CLO 2	2. Students are capable of comprehending and implementing the mangrove ecosystem based on up-to-date literature, the internet/website, and other references, as well as being able to produce written material for presentation in class.	PLO 5

Kode / Code	Deskripsi / Description	PLO/SO/ELO/CPL/LG
CLO 3	3. Students' mastery of the course can be assessed through learning evaluations, which include mid-term exams (35%), end-of-semester exams (35%), presented assignments (15%), and quizzes (15%). The final grade is based on the aforementioned evaluations and is presented as letter grades, ranked according to the class's average score.	PLO 2

PLO / PI *Detail*

PLO6	SKill (Logic, Critical, Innovative Thinking)	*Able to apply logical, critical, systematic and innovative thinking skills by utilizing information technology to produce solutions in form of scientific documents individually as well as in a team.*
PLO5	Knowledge (Analyse Comprehensively in the Specific Fields)	*Able to analyze comprehensively updated issues in the specific fields of silviculture, forest management, forest products technology or forest resource conservation, and to recommend possible solutions based on difined problems.*
PLO2	Value (responsibility, confidence, emotional maturity,ethics, lifelong learner, developnetwork)	*Having responsibility, confidence, emotional maturity, ethics, and awareness of being a lifelong learner and able to develop network.*

B. Topik Perkuliahan / *Course Materials*

Bahasan / *Main Discussion*	Estimasi Waktu / Estimated Times (Hour)	Kompetensi (Course Learning Outcomes)
1. Introduction/Mangrove ecosystem	1.5	Knowledge
2. Zoning of mangroves and constituent species	1.5	knowledge
3. Associated biota	1.5	knowledge
4. Mangrove habitat and influencing factors	1.5	knowledge
5. Mangrove habitat quality	1.5	knowledge
6. Mangrove productivity	1.5	knowledge
7. Material and energy cycles	1.5	knowledge
8. Mangrove degradation and rehabilitation	1.5	value
9. Degradasi dan rehabilitasi mangrove	1.5	value
10. Silviculture and mangrove management strategies	1.5	skill
11. Research Methods in Mangrove Forests	1.5	skill

C. Rencana Asesmen / Assesment Plan

CO/CPMK	Tipe / *Type*	Deskripsi / *Description*	Persentase / *Percentage*	PLO/SO/ELO/CPL/LG
CLO 1	TUGAS	Assignment	15	PLO 6
CLO 1	QUIZ	Question	15	PLO 6
CLO 2	MID-TERM EXAM	Question	35	PLO 5
CLO 3	FINAL EXAM	Question	35	PLO 2

D. Referensi / References

Hogarth, P. 1999. *The Biology of Mangrove*. Oxford University.

Clinton J. Dawes. 1998. *Marine Botany*. John Wiley & Sons Inc.

William J.Fitzgerald. 1997. Silvofishery : An Integrated Mangrove Forest And Aquaculture System.

Aksornkoae, S. 1993. *Ecology and Management of Mangrove*. IUCN - The World Conservation Union. Bangkok, Thailand.

Anonim, 2005. *Pedoman Pengelolaan Ekosistem Mangrove*. Direktorat Jenderal Pesisir Direktorat Jenderal Pesisir dan Pulau-Pulau Kecil Departeman Kelautan dan Perikanan. Jakarta.

Anonim. 2006. *Pola Umum Rehabilitasi Mangrove*. Dirjen RLPS Departemen Kehutanan. Indonesia.

Ludwig and Reynold. 1988. *Statistical Ecology*. John Wiley & Sons Publisher.

Poedjirahajoe, E. 2019. Ekologi Mangrove: Karakteristik, Fungsi dan Dinamikanya. GosyenPublishing.

Yogyakarta

E. Rencana Kegiatan Pembelajaran Mingguan (RKPM) / *Weakly Teaching Plan*

Week	Learning Objective	Topic	Teaching Media	Assesment Method	Teaching Method	Student Activity	Lecturer Activity	Learning Resources
1	Students are able to understand and explain a. Ecology and Ecosystem Components b. Structural and functional differences c. Vertical Stratification d. Tides e. Definition of mangrove f. Overview of mangroves	Introduction	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Hogarth, P. 1999. The Biology of Mangrove – an Ecological Approach. Oxford University
2	Students are able to understand and explain a. Intertidal zone b. Physical factors of the beach c. Mangrove zoning d. Mangrove green belt e. Mangrove constituent vegetation	Mangrove zoning and vegetation	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Hogarth, P. 1999. The Biology of Mangrove – an Ecological Approach. Oxford University.
3	Students are able to understand and explain a. Plankton, Nekton and Benthos b. Plankton dynamics Mangrove macroscopic biota	Mangrove Aquatic Biota	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Clinton J. Dawes. 1998. MarineBotany. JohnWiley & SonsInc.

Week	Learning Objective	Topic	Teaching Media	Assesment Method	Teaching Method	Student Activity	Lecturer Activity	Learning Resources
4	Students are able to understand and explain a. The role of mangrove mud b. Physical factors, habitat chemistry c. Mangrove rooting d. Habitat dynamics and grouping	Mangrove habitat	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Aksornkoae, S. 1993. Ecology and Management of Mangrove. IUCN - The World Conservation Union. Bangkok, Thailand.
5	Students are able to understand and explain a. The role of mangrove mud b. Physical factors, habitat chemistry c. Mangrove rooting d. Habitat dynamics and grouping	Mangrove habitat	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Aksornkoae, S. 1993. Ecology and Management of Mangrove. IUCN - The World Conservation Union. Bangkok, Thailand.
6	Students are able to understand and explain a. Salinity as the main growth factor b. The role of beach physics on habitat quality c. Mangrove growth	Mangrove habitat quality	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Anonim, 2005. Pedoman Pengelolaan Ekosistem Mangrove. Direktorat Jenderal Pesisir Direktorat Jenderal Pesisir dan Pulau-Pulau Kecil Departeman Kelautan dan Perikanan. Jakarta.
7	Students are able to understand and explain a. Mangrove biomass b. Factors that affect mangrove productivity	Mangrove productivity	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Aksornkoae, S. 1993. Ecology and Management of Mangrove. IUCN - The World Conservation Union. Bangkok, Thailand.

Week	Learning Objective	Topic	Teaching Media	Assesment Method	Teaching Method	Student Activity	Lecturer Activity	Learning Resources
8	Students are able to understand and explain a. Sources of organic matter b. Energy supply and food chain c. Nutrients in the Mangrove Forest d. The role of mangrove debris	Material and energy cycles	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Aksornkoae, S. 1993. Ecology and Management of Mangrove. IUCN - The World Conservation Union. Bangkok, Thailand.
9	Students are able to understand and explain a. General function of mangroves b. Ecotourism c. Silvofishery d. Mangrove charcoal	Mangrove function and utilization	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	William J.Fitzgerald. 1997. Silvofishery :An Integrated Mangrove Forest And Aquaculture System.
10	Students are able to understand and explain a. Degradation by nature and humans b. Impact on the ecosyste c. Biota migration d. Mangrove Rehabilitation	Mangrove degradation and rehabilitation	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Anonim. 2006. Pola Umum Rehabilitasi Mangrove. Dirjen RLPS Departemen Kehutanan. Indonesia.
11	Students are able to understand and explain a. Nursery b. Land preparation c. Planting d. Watering and Maintenance	Mangrove silviculture	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Anonim. 2006. Pola Umum Rehabilitasi Mangrove. Dirjen RLPS Departemen Kehutanan. Indonesia.

Week	Learning Objective	Topic	Teaching Media	Assesment Method	Teaching Method	Student Activity	Lecturer Activity	Learning Resources
12	Students are able to understand and explain a. Study of all habitat components b. Linkages between habitat components c. Conservation of the area d. Sustainable utilization	Mangrove Management Strategy	Module Laptop Whiteboard LCD Video	Activeness of discussion	a. Face to face b. Discussion	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	William J.Fitzgerald. 1997. Silvofishery :An Integrated Mangrove Forest And Aquaculture System.
13	Students are able to understand and explain a. Study of all habitat components b. Linkages between habitat components c. Conservation of the area d. Sustainable utilization	Mangrove Management Strategy	Module Laptop Whiteboard LCD Video	Activeness of discussion	Discussion activeness	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	William J.Fitzgerald. 1997. Silvofishery :An Integrated Mangrove Forest And Aquaculture System.
14	Students are able to understand and explain a. Use of sampling plots b. Measurement of ecosystem components c. Analysis d. Habitat clustering models	Research Methods in mangrove forest	Module Laptop Whiteboard LCD Video	Activeness of discussion	Discussion activeness	Summarize and actively discuss	a. Detailing the subject matter b. Guiding the discussion	Ludwig and Reynold. 1988. Statistical Ecology. John Wiley &Sons Publisher.