



**MINISTRY OF RESEARCH, TECHNOLOGY AND HIGHER EDUCATION**  
**YOGYAKARTA STATE UNIVERSITY**  
**FACULTY OF MATHEMATICS AND NATURAL SCIENCE**

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**RENCANA PEMBELAJARAN SEMESTER**

<b>Study Program</b>	: Biology
<b>Course</b>	: <b>Ecology</b>
<b>Code</b>	: <b>BIO6214</b>
<b>Number of semester credit system</b>	: 2
<b>Semester</b>	: 3
<b>Course Prerequisite</b>	: -
<b>Lecturer</b>	: Prof. Dr. IGP. Suryadarma, Dr. Suhartini, Dr. Tien Aminatun

**Description of the course:**

The course emphasizes the understanding of organism existence as a biosystem in maintaining its existence. The strategy of maintaining the existence of biosystem at various levels of the organizational structure of life through the mechanism of interaction with the internal environment of the population and its external environment. The phenomenon of biosystem as an expression of the uniqueness integration of biological structure level of living things in supporting life function. Survivalship is supported by the balance of input and energy availability through the food chain obtained in the foodweb of life. The foodweb of life is built on the unique structure and function of ecosystem. The uniqueness of the abiotic and biotic components of structure that build function of ecosystem. The ecosystem function are based on the biodiversity, food chain, foodweb, energy flow, and biogeochemical cycle. The uniqueness of every organism in trophic levels ranging from producer, consumer and decomposer that build trophic structure and ecological pyramid. Various associations and interactions of organisms determine the stability of ecosystem through cybernetic mechanism. Ecosystem classification is categorized by its energy input characteristic. The population size and population dynamic of ecosystem become a variant of ecosystem stability as the realization of their position and function in the ecosystem.

***Program Learning outcome (PLO) which is charged to this course :***

PLO 4. Mastering the structure of biology in depth (core biology) to solve problems faced in the field of biology (problem solving) and as capital in mastering other related science (related science).

PLO 6. Adaptif, kreatif, dan inovatif dalam menerapkan ilmu biologi dan ilmu terkait.

PLO 9. Able to pursue a career or create employment opportunities / entrepreneurship in the field of biology

PLO 11. Have scientific skills as a supporter of public speaking skills in local, national and international forums.

**Course outcome (CO) :**

1. Be able to describe the existence of organisms in various levels of organizational structure of life in every ecosystem
2. Be able to describe the interrelationship between the structural component and function of ecosystem which is built through the biodiversity of ecosystem, the uniqueness of biogeochemical cycle, and energy flow built in the food chain and food web
3. Be able to analyze the basic of ecosystem stability and the role of each of the abiotic and biotic components as well as the complexity of the established function
4. Be able to describe and analyze the unique structure and function of ecosystem according to the uniqueness and the type of ecosystem.
5. Mastering the essence and basic principles of biosystems in the activities of real life of individuals, groups and communities.
6. Be able to understand the role of specific relationships among organisms that form biosystem in the ecosystem dynamic and stability
7. Be able to analyze the support and linkage between the progress of science and technology in understanding the uniqueness of each biosystem as an ecological study
8. Be Able to work independently or in groups in group discussion activities

1	2	3	4	5	6	7	8	9	10
Meeting to	Course-Outcomes	Topics	Learning model	Learning Experience	Assessment indicator	Assessment technique	Assessment scoring	Time	Reference
1	CO1 CO7 CO8	Ecosystems as ecological studies are formed by the uniqueness of the structure as the forming fung of ecological functions as a system	Lecture/ Discussion	<ol style="list-style-type: none"> <li>1. Understanding the principles of ecological systems and biosystems and their feedback mechanisms</li> <li>2. Ecological status in biology and its relevance to other scientific fields</li> <li>3. Know the components of structures and functions that are built according to the uniqueness of the ecosystem</li> <li>4. Identify, describe the various components of the abiotic structure Describe hubungan components of ecosystem structures that membangun function ecosystem ecosystem ecosystem</li> <li>5. Describe the function of ecosystem function in</li> </ol>	<ol style="list-style-type: none"> <li>1. Can explain the ecological position in the biological family and its relevance to the theme of the biology theme as a whole</li> <li>2. Identify the various components of the ecosystem structure on a particular system</li> <li>3. Classifying biotic and biotic components as structural components</li> <li>4. Know the kinds of functions formed by the existence and interaction of structural components</li> </ol>	<p>Student response</p> <p>The division of syllabus and the preparation of field observation tasks</p>	10%	1x100 minutes	C

				certain ecosystem in the field					
2-3	CO2 CO7 CO8	<ol style="list-style-type: none"> <li>1. Understanding the uniqueness of Mangrove area as a natural ecosystem</li> <li>2. Understanding the river basin as a single ecosystem</li> <li>3. Understanding the mountain area as a single ecosystem</li> <li>4. Analyze and classify the main components of the ecosystem structure and function</li> </ol>	Lecture; Discussion Field observation	<ol style="list-style-type: none"> <li>1. Describe the components of biotic and abiotic of ecosystem structure of Mendit sandy mangrove</li> <li>2. Describe the kinds of diversity, energy cycle of energy, net of food net as component of mangrove ecosystem function of Pasir Mendit</li> <li>3. Describe the components of the biotic and abiotic structure of the Opak River ecosystem</li> <li>4. Describe the diversity, the energy cycle, the net of food webs as a component of the function of the Opak River ecosystem</li> <li>5. Describe the components of biotic and abiotic ecosystem structure of Mount Merapi</li> <li>6. Describe the diversity, the energy cycle, the net of food net as a component of ecosystem function of Mount Merapi</li> </ol>	<ol style="list-style-type: none"> <li>1. Describe various kinds of physical components, khemis environmental components</li> <li>2. Describe the diversity, the cycle of energy matter, the association specification between the biotic components as a function ekosistem mangrove Sand Mendit</li> <li>3. Describe the various kinds of physical components, khemis environmental components of the River Opak</li> <li>4. Describe the diversity, the cycle of energy matter, the association specification between the biotic components as the function of the Oposs River ecosystem</li> <li>5. Describe various kinds of physical components, echemical components of Mount Merapi environment</li> <li>6. Describe the diversity, the cycle of energy matter, the association specification between the biotic components as the function ekosistem</li> </ol>	<ol style="list-style-type: none"> <li>1. Observation, discussion and Q &amp; A</li> <li>2. Duties and group work</li> </ol>	15 %	2×100 minutes	A.C

					Mount Merapi				
4	CO3 CO8	1. Unique analysis of various structural components and component complexity of the function 2. Stability and equilibrium dynamics of ecological systems	1. Presentations of groups 2. Discussion 3. Summary	1. Identify the development of science / biology and philosophy in the uniqueness of a particular era  2. Analyze and inference knowledge of the unique period of time and the development of science and problem problems encountered	Mampu menjelaskan komponen struktur fungsi ekosistem dan keseimbangan ekologi	1. Observation of discussion and Q & A 2. Duties and group work 3. Report of observation result	10 %	1×100 minutes	C
5-6	CO4 CO8	1. Tingkatan tropik pembangun piramida ekologis 2. Piramida antara produsen konsumen dan dekomposer piramida ekologis 3. Macam macam spesiasi hubungan antara organismsumber penyusun ekosistem 4. Siklus biogeokhemis sebagai model dasar penyediaan materi dan energi sebagai pembentuk jaring maknan 5. Macam macam siklus unsur unsur kimia sebagai sumber materi dan energi	1. Presentasi kelompok 2. Diskusi 3. Ringkasan	1. Mengidentifikasi Perkembanganilmu sains/biologi diantara spesifikasi aliran pemikiran empirisme, idealisme, eksistensialisme dan pengetahuan	Mampu menjelaskan piramida ekologi dan faktor-faktor yang mempengaruhinya	1. Pengamatan diskusi dan tanyajawab  2. Tugas dan kerja kelompok  <b>3. Ringkasan hasil diskusi</b>	10%	2×100 menit	B,C
7-8	CO4	1. The kind of ecosystem based on its energy input 2. Type of	1. Presentations of groups 2. Discussion	1. Understand the uniqueness of the method 2. Analyze	Mampu menjelaskan: Jenis ekosistem berdasarkan input energinya, berdasarkan karakteristik habitat Mampu menjelaskan	1. Observation, discussion and Q & A 2. Duties and	10 %	2×100 minutes	C

		ecosystem based on habitat characteristics 3. Ecological succession mechanisms 4. Ecosystem development towards climax stage	3. Summary		mekanisme suksesi ekologi dan tahapan atau perkembangan ekosistem menuju klimaks	group work 3. Summary of discussion results			
9		MIDTERM				Tes tertulis			A,B,C, D
10	CO5	1. Pattern and Basic Type of Biogeochemic Cycle 2. Biogeochemical Reserve and Deposition 3. Sikulus Global Carbon and Water 4. Sedimentation Cycle 5. Nutrient cycle in Tropic	1. Presentations of groups 2. Discussion 3. Summary	1. Understand the truth and 2. Analyze and understand	Mampu menjelaskan pola dasar daur biogeokimia, sedimentasi dan siklus nutrien di kawasan tropika	1. Observation of discussion and Q & A 2. Group work assignments and Summary of discussion results	15%	1x100 minutes	C
11-12	CO1 CO6	1. Support the ecosystems based on the complexity of the structure components and their functions and tropical levels 2. resilience of ecosystems based on their ability to restore stability	1. Presentations of groups 2. Discussion 3. Summary	Menggalireferensi Berdiskusi Tanya jawab Presentasi Menanggapi persoalan berkaitan dengan struktur fungsi ekosistem dan stabilitas ekosistem	Mampu menjelaskan struktur fungsi ekosistem dan stabilitas ekosistem	Observasi, presentasi	10 %	2x100 minute	B,C
13	CO1, CO6 CO8	1. The limiting factor in the	1. Presentations of	Berdiskusi Tanya jawab dan Menanggapi persoalan	<b>Mampu menjelaskan faktor-faktor pembatas dalam ekosistem, hukum</b>	Observasi, diskusi	5 %	1x100 menit	C

		ecosystem 2. Liebig's minimum law as a limiting factor 3. Compensation factors	groups 2. Discussion 3. Summary	berkaitan dengan Faktor pembatas dalam ekosistem, Hukum minimum Liebig sebagai faktor pembatas dan . Faktor kompensasi	<b>minimu Liebig dan faktor kompensasi</b>				
<b>14-15</b>	CO1 CO6 CO7 CO8	1. Nature of Population Group 2. The basic principle of Improvement 3. Internal Factors of Natural Enhancement 4. Forms of Population Growth Population Fluctuations and Cycles	1. Presentations of groups 2. Discussion 3. Summary	Presentasi dan Menanggapi persoalan berkaitan pertumbuhan populasi dan faktor-faktor yang mempengaruhinya	<b>Mampu menjelaskan tentang pertumbuhan dan dinamika populasi</b>	Presentasi, diskusi dan pelaporan hasil	15 %		C,D
<b>16</b>	Final exam					Testertulis			A,B,C, D

Final Rating:

$$\text{Final score} = \frac{(\text{Weight value per sub topic} \times 70) + (\text{final exam value} \times 30)}{100}$$

### References

- A. Aksornkoe, S. 1993. Ecology and Management of Mangrove. IUCN, Bangkok, Thailand
- B. Idriyanto. 2006. Forest Ecology. PT Bumi Aksara. Jakarta
- C. Odum, Eugene P. 1996. Fundamentals of Ecology; Third Edition. Yogyakarta. Gadjah Mada University Press, Samingan Translator, Tjahjono.
- D. Soegianto, A. 1994. Quantitative Ecology. National Business Publisher. Surabaya.

### PLO dan CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
CO 1				v							
CO 2				v							
CO 3				v		v					
CO 4				v							
CO 5				v		v					
CO 6				v							

CO 7				v		v			v		
CO 8											v

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