



Universitas Negeri Surabaya
Faculty of Mathematics and Natural Sciences
Bachelor of Science Education Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Animal Anatomy and Physiology	8420103167		T=2	P=1	ECTS=4.77	4	July 18, 2024
AUTHORIZATION		SP Developer	Course Cluster Coordinator			Study Program Coordinator	
				Prof. Dr. Erman, M.Pd.	
Learning model	Project Based Learning						
Program Learning Outcomes (PLO)	PLO study program that is charged to the course						
	Program Objectives (PO)						
	PLO-PO Matrix						
		P.O					
Short Course Description	This lecture aims to provide knowledge and skills about animal anatomy and physiology. In it, this course discusses the physiology of the human body in the context of comparison with animals in the vertebrate group. Learning begins with an introduction in the form of important terms. Furthermore, the lecture invites students to study the anatomy and physiology of organ systems (nervous, motor, cardiovascular, digestive, respiratory, uropoetic and urogenital), animal navigation systems, and embryonic development. Lectures are also supported by laboratory activities to make it easier for students to access knowledge about material that is generally abstract. Others, learning opportunities outside of face-to-face lectures are provided in the form of structured assignments. On the topic of communication and navigation in animals, the main focus is on the processes and mechanisms of animal migration from one place to another within a certain time span; range in vertebrates.						
	References						
References	Main :						
	<ol style="list-style-type: none"> 1. Allen, Connie dan Valerie Harper. 2011. Laboratory Manual for Anatomy and Physiology 4th Edition. Danvers: John Wiley & Sons. 2. Despopoulos, A. dan Stefan Silbernagl. 2003. Color Atlas of Physiology . New York: Thieme. 3. Hill, Richard W., Gordon A. Wyse, dan Margaret Anderson. 2012. Animal Physiology, Third Edition . Sunderland: Sinauer Associates. 4. Sherwood, L, Hillar Klandorf, dan Paul H. Yancey. 2012. Animal Physiology: From Genes to Organisms 2nd Edition . UK: Brooks Cole 5. Tim SFPH. 2014. Panduan Praktikum Struktur, Fungsi, dan Perkembangan Hewan (SFPH) . Unesa. 6. Tortora, GJ dan Bryan Derrickson. 2014. Principles of Anatomy and Physiology 13th Edition Volume 1 . Danvers: John Wiley & Sons. 7. Tortora, GJ dan Bryan Derrickson. 2014. Principles of Anatomy and Physiology 13th Edition Volume 2 . Danvers: John Wiley & Sons. 						
Supporting lecturer	Supporters:						
	Dr. Nur Duchu, S.Si., M.Si. Dr. Dyah Astriani, S.Pd., M.Pd. Enny Susiyawati, S.Si., M.Sc., M.Pd., Ph.D. Dhita Ayu Permata Sari, S.Pd., M.Pd. Aris Rudi Purnomo, S.Si., M.Pd., M.Sc.						
Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (offline)	Online (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	<p>1.Understand the general structure of plant body morphology</p> <p>2.Understand the anatomical structure of the plant body</p> <p>3.Understand the relationship between plant body parts</p> <p>4.Understand how to make fresh preparations of plant body parts</p>	<p>Understand the terms used to position the organs that make up the body of vertebrate animals</p>	<p>Criteria: Attached to the Assessment Instrument and Assessment Rubric</p> <p>Form of Assessment : Participatory Activities</p>	<p>Student-centered learning approach (student centered) Deductive learning strategy Learning method is carried out by searching literature, discussions, analyzing images according to the literature obtained, powerpoint presentations by lecturers, and practicums. 3 X 50</p>		<p>Material: Lecture coverage of animal anatomy and physiology courses and terms used to position the organs that make up the body of vertebrate animals.</p> <p>References: <i>Sherwood, L. Hillar Klandorf, and Paul H. Yancey. 2012. Animal Physiology: From Genes to Organisms 2nd Edition. UK: Brooks Cole</i></p>	5%
2	<p>Utilize ICT to search for data and information in order to solve problems related to the digestive system. Master the concept of structure and function of the digestive system in a comprehensive, stable and in-depth manner and be able to develop and apply it to study higher biological knowledge in accordance with developments in science and technology.</p>	<p>1.Utilizing ICT to search literature related to the vertebrate digestive system</p> <p>2.Sequencing the organs involved in the digestive system</p> <p>3.Describe the different characteristics of the digestive tract</p> <p>4.Explain the mechanism of peristalsis</p> <p>5.Identify abnormalities/diseases in the human movement system</p>	<p>Criteria: Attached to the Assessment Instrument and Assessment Rubric</p>	<p>Student-centered learning approach (student centered) Inductive learning strategy Learning method is carried out by searching literature, discussions using presentation models, powerpoint presentations by lecturers, practicums, and analyzing problems according to literature obtained from the internet, library, and practicum (LKM) 3 X 50</p>			0%

3	Utilizing ICT to search for data and information in order to solve problems related to the circulatory system Understand the circulatory system comprehensively and deeply and be able to develop and apply it to study higher biological knowledge in accordance with developments in science and technology	<ol style="list-style-type: none"> 1.Name the organs that make up the circulatory system 2.Describe the characteristic features of the organs that make up the circulatory system 3.Explain the mechanisms of pulmonary and systemic blood circulation 4.Analyze the factors that influence the working mechanism of the circulatory system 5.Explain the mechanism of blood transfusion and blood clotting 6.Identify disorders/diseases related to the circulatory system 7.Explain the prevention of diseases that attack the circulatory system 	Criteria: Attached	Student-centered learning approach (student centered) Inductive learning strategy Learning method is carried out by searching literature, discussions using presentation models, powerpoint presentations by lecturers, practicums, and analyzing problems according to literature obtained from the internet, library, and practicum (LKM) 3 X 50			0%
4	Utilizing science and technology to explore data and information in order to solve problems related to the vertebrate circulatory system. Mastering the concept of structure and function of the circulatory system in a comprehensive, stable and in-depth manner and being able to develop and apply it to study higher biological knowledge in accordance with scientific developments and technology	<ol style="list-style-type: none"> 1.Utilizing ICT to search literature and information about the circulatory system in vertebrates 2.Distinguish between systemic and pulmonary circulation 3.Sequencing the organs involved in systemic and pulmonary circulation 4.Identify the structure of arteries and veins 5.Explain the principles that act on blood pressure in arteries and veins 6.Distinguish between the working principles of blood and lymph circulation 7.Explain the causes of abnormalities in the vertebrate circulatory system 8.Understand research articles related to the circulatory system 	Criteria: Attached to the assessment rubric	Student-centered learning approach (student centered) Deductive learning strategy Learning method is carried out by searching literature, discussions, analyzing problems according to the literature obtained (LKM), powerpoint presentations by lecturers, and practicums. 3 X 50			0%

5	<p>Utilizing science and technology to explore data and information in order to solve problems related to the female reproductive system. Understand the female reproductive system comprehensively, steadily and deeply and be able to develop and apply it to study higher biological knowledge in accordance with developments in science and technology</p>	<ol style="list-style-type: none"> 1.Utilizing ICT to conduct literature searches regarding the female reproductive system 2.Understand the role of each organ that makes up the female reproductive system 3.Understanding the process of oogenesis 4.Explain the process of ovulation and menstruation 5.Explain the role or work of hormones in influencing the process of ovulation and menstruation 6.Understanding the menstrual cycle 7.Apply knowledge about the menstrual cycle in order to monitor women's reproductive health 8.Understand the causes of abnormalities in the female reproductive system 9.Have awareness of the dangers of sexual deviation 	<p>Criteria: Attached to the assessment instrument</p>	<p>Student-centered learning approach (student centered) Inductive learning strategy carried out using the 5E model. The learning method is carried out by identifying problems from practicum, analyzing practicum results with literature, presenting practicum results and material content, and evaluating lesson results with two-way discussions between the lecturer and student. 3 X 50</p>			0%
6	<p>Utilizing science and technology to explore data and information in order to solve problems related to the male reproductive system. Understand the male reproductive system comprehensively, steadily and in depth and be able to develop and apply it to study higher biological knowledge in accordance with developments in science and technology</p>	<ol style="list-style-type: none"> 1.Utilizing ICT to conduct literature searches on the male reproductive system 2.Sort the organs that make up the male reproductive system based on the process of ejaculation 3.Understanding the process of spermatogenesis 4.Describe the abnormalities that occur in the male reproductive system 5.Have awareness of the dangers of sexual deviation 	<p>Criteria: Attached to the assessment rubric</p>	<p>Student-centered learning approach. Deductive learning strategy. Learning method is carried out by searching literature, discussions, analyzing problems according to the literature obtained (LKM), powerpoint presentations by lecturers, and practicums. 3 X 50</p>			0%
7	<p>Utilizing science and technology to explore data and information in order to solve problems related to the process of pregnancy and embryo development. Explaining the process of pregnancy and embryo development in a comprehensive, solid and in-depth manner and being able to develop and apply it to study higher biological knowledge in accordance with scientific developments and technology</p>	<ol style="list-style-type: none"> 1.Explain the process of fertilization in vertebrates 2.Understand embryo development from zygote to gastrula 3.Explain the process of morphogenesis 	<p>Criteria: Attached to the assessment rubric</p>	<p>Student-centered learning approach. Deductive learning strategy. Learning method is carried out by searching literature, discussions, analyzing problems according to the literature obtained (LKM), powerpoint presentations by lecturers, and practicums. 3 X 50</p>			0%
8	<p>Meeting 1 to meeting 7</p>	<p>Meeting 1 to meeting 7</p>	<p>Criteria: Attached to the Assessment Instrument and Assessment Rubric</p>	<p>2 X 50</p>			0%

9	<p>Utilizing science and technology to explore data and information in order to solve problems related to active movement systems. Understand active movement systems comprehensively, steadily and deeply and be able to develop and apply them to study higher biological knowledge in accordance with developments in science and technology</p>	<ol style="list-style-type: none"> 1.Utilizing ICT to search literature related to active movement systems 2.Explain the microscopic structure of muscles 3.Explain the mechanism of muscle contraction 4.Apply the principles of muscle work to planned sports activities 	<p>Criteria: Attached to the assessment rubric</p>	<p>Student-centered learning approach (student centered) Deductive learning strategy Learning method is carried out by searching literature, discussions using presentation models, PowerPoint presentations by lecturers, practicums, and analyzing problems according to literature obtained from the internet, library, and practicum 3</p>			0%
10	<p>Utilizing science and technology to explore data and information in order to solve problems related to the structure and function of the movement system. Mastering the concept of structure and function of the movement system in a comprehensive, solid and in-depth manner and being able to develop and apply it to study higher biological knowledge in accordance with scientific developments and technology.</p>	<ol style="list-style-type: none"> 1.Utilizing ICT to conduct literature searches 2.Describe the skeletal system in animals 3.Describe the structure and function of bones 4.Describe the relationships between bones 5.Describe the mechanism of muscle contraction 6.Describe the mechanisms of movement in some animals (e.g. birds) 7.Identify abnormalities/diseases in the human movement system 	<p>Criteria: Attached to the assessment rubric</p>	<p>Student-centered learning approach (student centered) Deductive learning strategy Learning method is carried out by searching literature, discussions using presentation models, PowerPoint presentations by lecturers, practicums, and analyzing problems according to literature obtained from the internet, library, and practicum 3</p>			0%

11	Utilizing science and technology to explore data and information in order to solve problems related to the structure and function of the nervous system. Mastering the concept of structure and function of the nervous system in a comprehensive, solid and in-depth manner and being able to develop and apply it to study higher biological knowledge in accordance with scientific developments and technology	<ol style="list-style-type: none"> 1.Utilizing ICT to conduct literature searches 2.Distinguish between groupings of nervous systems in vertebrates 3.Identify the structure and function of nerve cells 4.Describe the mechanism of transmission of nerve impulses 5.Describe the central nervous system and peripheral nervous system in vertebrates 6.Explain the work of reflex movements 7.Explain the effect of illegal drugs on the nervous system 8.Describe disorders/diseases in the human nervous system 	Criteria: Attached to the assessment instrument	Student-centered learning approach (student centered) Inductive learning strategy Learning method is carried out by literature searches, discussions using presentation models, PowerPoint presentations by lecturers, practicums, and analyzing problems according to literature obtained from the internet and libraries 3 X 50		0%
12	Utilizing science and technology to explore data and information in order to solve problems related to the structure and function of the nervous system. Mastering the concept of structure and function of the nervous system in a comprehensive, solid and in-depth manner and being able to develop and apply it to study higher biological knowledge in accordance with scientific developments and technology	<ol style="list-style-type: none"> 1.Utilizing ICT to conduct literature searches 2.Distinguish between groupings of nervous systems in vertebrates 3.Identify the structure and function of nerve cells 4.Describe the mechanism of transmission of nerve impulses 5.Describe the central nervous system and peripheral nervous system in vertebrates 6.Explain the work of reflex movements 7.Explain the effect of illegal drugs on the nervous system 8.Describe disorders/diseases in the human nervous system 	Criteria: Attached to the assessment instrument	Student-centered learning approach (student centered) An inductive learning strategy carried out within the essence of the 5E model. The learning method is carried out by identifying problems from practicum, analyzing practicum results with literature, presenting practicum results and material content, and evaluating lesson results with two-way discussions between lecturers and students 3 X 50		0%

13	Utilize science and technology to explore data and information in order to solve problems related to the respiratory system in vertebrate animals. Master the concepts of the respiratory system comprehensively, steadily and in depth and be able to develop and apply them to study higher biological knowledge in accordance with developments in science and technology.	<ol style="list-style-type: none"> 1.Utilizing ICT to search for valid information about the respiratory system in vertebrate animals and humans 2.Sequencing the organs involved in the respiratory process 3.Describe the characteristics of the organs involved in the respiratory process 4.Explain the process of oxygen exchange that occurs in the walls of the alveoli 5.Review scientific articles about the respiratory system in animals and humans 6.Apply the principles of the respiratory system to support healthy daily living 	Criteria: Attached to the assessment instrument	Student-centered learning approach (student centered) An inductive learning strategy carried out within the essence of the 5E model. The learning method is carried out by identifying problems from practicum, analyzing practicum results with literature, presenting practicum results and material content, and evaluating lesson results with two-way discussions between lecturers and students 3 X 50			0%
14	Utilizing science and technology to explore data and information in order to solve problems related to the uropoetic system. Mastering the concept of structure and function of the uropoetic system in a comprehensive, solid and in-depth manner and being able to develop and apply it to study higher biological knowledge in accordance with developments in science and technology	<ol style="list-style-type: none"> 1.Utilizing ICT to search literature related to the uropoetic system 2.Describe the differences in kidney structure of the pronephros, mesonephros and metanephros types 3.Explain the sequence of urine formation processes in the vertebrate kidney 	Criteria: Attached to the assessment instrument	Student-centered learning approach (student centered) Deductive learning strategy Learning method is carried out by searching literature, discussions using presentation models, PowerPoint presentations by lecturers, practicums, and analyzing problems according to literature obtained from the internet, library, and practicum 3			0%

15	Utilizing science and technology to explore data and information in order to solve problems related to hormones in vertebrates. Mastering the concept of the structure and function of hormones comprehensively, steadily and in depth and being able to develop and apply them to study higher biological knowledge in accordance with developments in science and technology	<ol style="list-style-type: none"> 1. Understand the definition of hormones in vertebrates 2. Name the types of hormones produced by glands 3. Explain the control mechanism of a hormone in influencing a bodily condition, such as an increased heart rate when frightened 4. Describe disorders caused by hormonal factors in the body 5. Presents a response to disorders caused by hormones 	Criteria: Attached to the Assessment Instrument and Assessment Rubric	Student-centred learning approach (student centered) Inductive learning strategy Learning method is carried out by searching literature, discussions using presentation models, PowerPoint presentations by lecturers, practicum, and analyzing problems according to literature obtained from the internet, library and practicum. (LKM) 2 X 50			0%
16							0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	5%
		5%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.