



**Universitas Negeri Surabaya**  
**Faculty of Sports and Health Sciences,**  
**Bachelor of Physical Education, Health & Recreation Study**  
**Program**

Document  
Code

**SEMESTER LEARNING PLAN**

<b>Courses</b>	<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>	<b>SEMESTER</b>	<b>Compilation Date</b>		
Anatomy and Physiology of Sport	8520103006		T=3 P=0 ECTS=4.77	2	July 18, 2024		
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>	<b>Study Program Coordinator</b>			
	.....		.....	Dr. Mochamad Ridwan, S.Pd., M.Pd.			
<b>Learning model</b>	Case Studies						
<b>Program Learning Outcomes (PLO)</b>	PLO study program which is charged to the course						
	Program Objectives (PO)						
	PLO-PO Matrix						
		<table border="1" style="margin: auto;"> <tr> <td style="width: 100px; height: 30px;">P.O</td> </tr> </table>					P.O
P.O							
<b>Short Course Description</b>	Understanding and mastery of human physiology which includes the structure and function of skeletal muscles, energy and hormone systems, nervous control of muscles, energy supply and fatigue, cardiovascular system, respiratory system, cardiovascular response, principles of exercise, adaptation to aerobic and anaerobic exercise, training in hot and cold environments, exercise at high altitudes, sports training, body composition and nutrition for sports, ergogenics and exercise, exercise in children and adolescents, the aging process and exercise. Learning is carried out through literature review, discussion and case studies.						
	<b>References</b>	<p><b>Main :</b></p> <ol style="list-style-type: none"> <li>1. Hasiane, Juanita Dolores dan Wahjuni, Endang Sri. 2017. Fisiologi Olahraga, buku ajar. Surabaya : Unesa University Press.</li> <li>2. Kusnanik, Nining W., dkk. 2011. Dasar-Dasar Fisiologi Olahraga. Surabaya: UNESA University Press.</li> <li>3. Mc.Ardle, William D. 2010. Exercise physiology: nutrition, energy, and human performance 7th ed. Wolter Kluwer. Lippincot Williams &amp; Wilkins.</li> <li>4. Wilmore, Costill and Kenney. 2008. Physiology of Sport and Exercise. 4th ed. Human Kinetics. USA.</li> </ol> <p><b>Supporters:</b></p>					
<b>Supporting lecturer</b>	Dr. dr. Endang Sri Wahjuni, M.Kes.						
<b>Week-</b>	<b>Final abilities of each learning stage (Sub-PO)</b>	<b>Evaluation</b>		<b>Help Learning, Learning methods, Student Assignments, [ Estimated time]</b>		<b>Learning materials [ References ]</b>	<b>Assessment Weight (%)</b>
		<b>Indicator</b>	<b>Criteria &amp; Form</b>	<b>Offline ( offline )</b>	<b>Online ( online )</b>		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	Understand the meaning of exercise physiology, its scope	<ol style="list-style-type: none"> <li>1.Able to explain the meaning of exercise physiology.</li> <li>2.Able to explain the scope of physiology.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures and questions and answers 2 X 50			0%
2	Understand the function and work of muscles and their fatigue	<ol style="list-style-type: none"> <li>1.Explain the physiology of muscle cells.</li> <li>2.Explain the function of muscles,</li> <li>3.Explain the relationship between nerves and muscles</li> <li>4.Identify muscle fiber types</li> <li>5.Explain the mechanisms of muscle contraction and relaxation.</li> <li>6.Explain the types of muscle contractions</li> <li>7.Explains muscle fatigue</li> <li>8.Explain changes in muscles</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%
3	Understand the function and work of muscles and their fatigue	<ol style="list-style-type: none"> <li>1.Explain the physiology of muscle cells.</li> <li>2.Explain the function of muscles,</li> <li>3.Explain the relationship between nerves and muscles</li> <li>4.Identify muscle fiber types</li> <li>5.Explain the mechanisms of muscle contraction and relaxation.</li> <li>6.Explain the types of muscle contractions</li> <li>7.Explains muscle fatigue</li> <li>8.Explain changes in muscles</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%
4	Understand the energy supply system	<ol style="list-style-type: none"> <li>1.Explain metabolism</li> <li>2.Explain the types of energy producing processes, namely anaerobic metabolism and aerobic metabolism.</li> <li>3.Explain about fat and protein metabolism.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions, questions and answers and assignments 2 X 50			0%

5	Understand the energy supply system	<ol style="list-style-type: none"> <li>1.Explain metabolism</li> <li>2.Explain the types of energy producing processes, namely anaerobic metabolism and aerobic metabolism.</li> <li>3.Explain about fat and protein metabolism.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions, questions and answers and assignments 2 X 50			0%
6	Understand the physiology of origin recovery and energy replenishment	<ol style="list-style-type: none"> <li>1.Explain about oxygen recovery\</li> <li>2.Mention the types of recovery periods</li> <li>3.Explaining about replenishing energy stores. Comparing the recovery process from continuous and intermittent exercise.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions, questions and answers and assignments 2 X 50			0%
7	Mastering the role of the environment, whether heat or height, in sports activities, understanding safe zones in sports, anticipating the impacts they can cause.	<ol style="list-style-type: none"> <li>1.Explain the effects of hot environments on exercise.</li> <li>2.Explain heat balance and heat production.</li> <li>3.Explain the dangers of exercising in hot temperatures.</li> <li>4.Explaining athletes' drinks.</li> <li>5.Explain the effects of exercising at high altitudes.</li> <li>6.Explain about acclimatization.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions, assignments and questions and answers 2 X 50			0%
8	Sub Summative Exam	Mastering face-to-face material 1 to 7.	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Test 2 X 50			0%
9	Understand the physiology of warming up and cooling down.	<ol style="list-style-type: none"> <li>1.Explain the purpose and function of warming up and the consequences if it is not done.</li> <li>2.Explain the purpose and function of cooling down and the consequences if it is not done.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%

10	Mastering the respiratory system during rest and activity.	<ol style="list-style-type: none"> <li>1.Explain the anatomy and physiology of the respiratory system.</li> <li>2.Understand the types of lung expansion.</li> <li>3.Understand breathing regulation. Understand pulmonary ventilation, alveolar ventilation at rest and exercise</li> <li>4.Understand the exchange of O<sub>2</sub> and CO<sub>2</sub> gases.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%
11	Mastering the respiratory system during rest and activity.	<ol style="list-style-type: none"> <li>1.Explain the anatomy and physiology of the respiratory system.</li> <li>2.Understand the types of lung expansion.</li> <li>3.Understand breathing regulation. Understand pulmonary ventilation, alveolar ventilation at rest and exercise</li> <li>4.Understand the exchange of O<sub>2</sub> and CO<sub>2</sub> gases.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%

12	Mastering the cardiovascular system at rest and activity.	<ol style="list-style-type: none"> <li>1.Explain the anatomy and physiology of the cardiovascular system</li> <li>2.Understanding blood circulation.</li> <li>3.Explain cardiac output.</li> <li>4.Understanding heart regulation.</li> <li>5.Explain changes in the cardiovascular system during rest and exercise.</li> <li>6.Explain the physiology of blood pressure</li> <li>7.Understand blood distribution during rest and exercise</li> <li>8.Understand the function of blood, blood cells and blood types.</li> <li>9.Explains the Karvonen method, namely how to calculate the working pulse.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%
13	Mastering the cardiovascular system at rest and activity.	<ol style="list-style-type: none"> <li>1.Explain the anatomy and physiology of the cardiovascular system</li> <li>2.Understanding blood circulation.</li> <li>3.Explain cardiac output.</li> <li>4.Understanding heart regulation.</li> <li>5.Explain changes in the cardiovascular system during rest and exercise.</li> <li>6.Explain the physiology of blood pressure</li> <li>7.Understand blood distribution during rest and exercise</li> <li>8.Understand the function of blood, blood cells and blood types.</li> <li>9.Explains the Karvonen method, namely how to calculate the working pulse.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%

14	Mastering the cardiovascular system at rest and activity.	<ol style="list-style-type: none"> <li>1.Explain the anatomy and physiology of the cardiovascular system</li> <li>2.Understanding blood circulation.</li> <li>3.Explain cardiac output.</li> <li>4.Understanding heart regulation.</li> <li>5.Explain changes in the cardiovascular system during rest and exercise.</li> <li>6.Explain the physiology of blood pressure</li> <li>7.Understand blood distribution during rest and exercise</li> <li>8.Understand the function of blood, blood cells and blood types.</li> <li>9.Explains the Karvonen method, namely how to calculate the working pulse.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%
15	Understanding VO2max, the factors that influence it and how to increase it.	<ol style="list-style-type: none"> <li>1.Explain what VO2max is</li> <li>2.Explain the factors that influence VO2max</li> <li>3.Explains how to increase VO2max</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly.	Lectures, discussions and questions and answers 2 X 50			0%
16							0%

**Evaluation Percentage Recap: Case Study**

No	Evaluation	Percentage
		0%

**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.