



**Universitas Negeri Surabaya**  
**Faculty of Mathematics and Natural Sciences**  
**Biology Undergraduate 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>																																																																																																																																																	
Gerontology	4620102222		T=2 P=0 ECTS=3.18	5	July 18, 2024																																																																																																																																																	
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>	<b>Study Program Coordinator</b>																																																																																																																																																		
	.....		.....	Dr. H. Sunu Kuntjoro, S.Si., M.Si.																																																																																																																																																		
<b>Learning model</b>	Project Based Learning																																																																																																																																																					
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																																																																																																																																																					
	<b>PLO-7</b>	Able to work independently and collaboratively, as well as responsibly, in completing various tasks in class, in the laboratory and in the field.																																																																																																																																																				
	<b>Program Objectives (PO)</b>																																																																																																																																																					
	<b>PO - 1</b>	Communicate important aspects of gerontology																																																																																																																																																				
	<b>PO - 2</b>	Communicate the causes of aging in general, stages of aging and premature aging																																																																																																																																																				
	<b>PO - 3</b>	Describe the effects of aging from various aspects (biological, physiological, psychological, psychosocial and spiritual)																																																																																																																																																				
	<b>PO - 4</b>	Describe diseases related to aging from various aspects (biological, physiological, psychological, psychosocial and spiritual) and ways to eliminate/reduce the symptoms																																																																																																																																																				
	<b>PO - 5</b>	Communicate the causes of aging at the molecular level, the structure of telomeres and their role in apoptosis and the aging process																																																																																																																																																				
	<b>PO - 6</b>	Communicate ways to prevent and reduce the rate of aging from various aspects (biological, physiological, psychological, psychosocial and spiritual aspects) and ways to eliminate/reduce the symptoms																																																																																																																																																				
	<b>PLO-PO Matrix</b>																																																																																																																																																					
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<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																																																																																																																																						
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<b>Short Course Description</b>	This course discusses scientific studies of the causes of aging, stages of aging, effects of aging, diseases related to aging which include biological, physiological, psychological, psychosocial and spiritual aspects of aging and ways to eliminate/reduce the symptoms. This course also examines the molecular causes of aging, including the structure of chromosomes, especially telomeres and their role in apoptosis and the aging process. This course also examines ways to prevent and reduce the rate of aging. Gerontology courses are presented through providing information, discussions and assignments to study related articles																																																																																																																																																					
<b>References</b>	<b>Main :</b>																																																																																																																																																					

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		<p><b>Supporters:</b></p>					
		<p>1. Artikel dari jurnal</p>					
<b>Supporting lecturer</b>		<p>Dr. Isnawati, M.Si. Fitriari Izzatunnisa Muhaimin, B.Sc., M.Sc.</p>					
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	Understand the concept of old age, the signs and stages of aging and premature aging	Communicating the definition of old Communicating the signs of old Communicating the stages of the aging process	<p><b>Criteria:</b></p> <ol style="list-style-type: none"> <li>According to the answer key, get the maximum score</li> <li>Many matches with the answer key get 50% or more of the maximum score</li> <li>Slight conformity with the answer key gets less than 50% to 10% of the maximum score</li> <li>Answering incorrectly gets a maximum of 9% of the maximum score</li> <li>Not answering gets a score of 0</li> </ol> <p><b>Form of Assessment :</b> Participatory Activities, Portfolio Assessment</p>	<p>a. Discussion b. Guided discovery 2 X 50</p>		<p><b>Material:</b> Signs of aging <b>Reference:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i> . English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i>. New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i> . English: Atria Books</p> <hr/> <p><b>Material:</b> Signs of aging <b>References:</b> Articles from journals</p>	5%
2	Understand the consequences of aging from biological, physiological, psychological, psychosocial and spiritual aspects	Describe the consequences of aging from a biological aspect Describe the consequences of aging from a physiological aspect Describe the consequences of aging from a psychological aspect Describe the consequences of aging from a psychosocial aspect Describe the consequences of aging from a spiritual aspect	<p><b>Criteria:</b></p> <ol style="list-style-type: none"> <li>According to the answer key, get the maximum score</li> <li>Many matches with the answer key get 50% or more of the maximum score</li> <li>Slight conformity with the answer key gets less than 50% to 10% of the maximum score</li> <li>Answering incorrectly gets a maximum of 9% of the maximum score</li> <li>Not answering gets a score of 0</li> </ol> <p><b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment</p>	<p>a. Discussion. b. Presentation of case search results due to aging from one of the assigned aspects 6 X 50</p>		<p><b>Material:</b> Aging from biological, physiological, psychosocial and spiritual aspects <b>References:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i> . English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i>. New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i> . English: Atria Books</p> <hr/> <p><b>Material:</b> Aging from biological, physiological, psychosocial and spiritual aspects <b>References:</b> Articles from journals</p>	4%

3	Understand the consequences of aging from biological, physiological, psychological, psychosocial and spiritual aspects	Describe the consequences of aging from a biological aspect Describe the consequences of aging from a physiological aspect Describe the consequences of aging from a psychological aspect Describe the consequences of aging from a psychosocial aspect Describe the consequences of aging from a spiritual aspect	<b>Criteria:</b> 1. According to the answer key, get the maximum score 2. Many matches with the answer key get 50% or more of the maximum score 3. Slight conformity with the answer key gets less than 50% to 10% of the maximum score 4. Answering incorrectly gets a maximum of 9% of the maximum score 5. Not answering gets a score of 0  <b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	a. Discussion. b. Presentation of case search results due to aging from one of the assigned aspects 6 X 50		<b>Material:</b> Aging from biological, physiological, psychosocial and spiritual aspects <b>References:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i> . English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i> . New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i> . English: Atria Books  <b>Material:</b> Aging from biological, physiological, psychosocial and spiritual aspects <b>References:</b> Articles from journals	5%
4	Understand the consequences of aging from biological, physiological, psychological, psychosocial and spiritual aspects	Describe the consequences of aging from a biological aspect Describe the consequences of aging from a physiological aspect Describe the consequences of aging from a psychological aspect Describe the consequences of aging from a psychosocial aspect Describe the consequences of aging from a spiritual aspect	<b>Criteria:</b> 1. According to the answer key, get the maximum score 2. Many matches with the answer key get 50% or more of the maximum score 3. Slight conformity with the answer key gets less than 50% to 10% of the maximum score 4. Answering incorrectly gets a maximum of 9% of the maximum score 5. Not answering gets a score of 0  <b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	a. Discussion. b. Presentation of case search results due to aging from one of the assigned aspects 6 X 50		<b>Material:</b> Diseases of aging from a biological, physiological, psychosocial and spiritual perspective <b>Reference:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i> . English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i> . New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i> . English: Atria Books  <b>Material:</b> Diseases of aging from a biological, physiological, psychosocial and spiritual perspective. <b>Reference:</b> Articles from journals	5%

5	Understanding diseases related to aging from biological, physiological, psychological, Psychosocial and spiritual aspects	Describe aging-related diseases from a biological aspect Describe aging-related diseases from a physiological aspect Describe aging-related diseases from a psychological aspect Describe aging-related diseases from a psychosocial aspect Describe aging-related diseases from a spiritual aspect	<p><b>Criteria:</b></p> <ol style="list-style-type: none"> <li>1. According to the answer key, get the maximum score</li> <li>2. Many matches with the answer key get 50% or more of the maximum score</li> <li>3. Slight conformity with the answer key gets less than 50% to 10% of the maximum score</li> <li>4. Answering incorrectly gets a maximum of 9% of the maximum score</li> <li>5. Not answering gets a score of 0</li> </ol> <p><b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment</p>	a. Discussion. b. Presentation of case search results due to aging from one of the assigned aspects 6 X 50		<p><b>Material:</b> Diseases of aging from a biological, physiological, psychosocial and spiritual perspective <b>Reference:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i>. English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i>. New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i>. English: Atria Books</p> <hr/> <p><b>Material:</b> Diseases of aging from a biological, physiological, psychosocial and spiritual perspective. <b>Reference:</b> Articles from journals</p>	5%
6	Understanding diseases related to aging from biological, physiological, psychological, Psychosocial and spiritual aspects	Describe aging-related diseases from a biological aspect Describe aging-related diseases from a physiological aspect Describe aging-related diseases from a psychological aspect Describe aging-related diseases from a psychosocial aspect Describe aging-related diseases from a spiritual aspect	<p><b>Criteria:</b></p> <ol style="list-style-type: none"> <li>1. According to the answer key, get the maximum score</li> <li>2. Many matches with the answer key get 50% or more of the maximum score</li> <li>3. Slight conformity with the answer key gets less than 50% to 10% of the maximum score</li> <li>4. Answering incorrectly gets a maximum of 9% of the maximum score</li> <li>5. Not answering gets a score of 0</li> </ol> <p><b>Form of Assessment :</b> Participatory Activities</p>	a. Discussion of the molecular aspects that occur in the aging process and its consequences 6 X 50		<p><b>Material:</b> structure of human chromosomes, telomeres, and their role in the process of apoptosis and aging <b>References:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i>. English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i>. New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i>. English: Atria Books</p> <hr/> <p><b>Material:</b> Molecular aspects of the aging process <b>References:</b> Articles from journals</p>	5%

7	Understanding diseases related to aging from biological, physiological, psychological, Psychosocial and spiritual aspects	Describe aging-related diseases from a biological aspect Describe aging-related diseases from a physiological aspect Describe aging-related diseases from a psychological aspect Describe aging-related diseases from a psychosocial aspect Describe aging-related diseases from a spiritual aspect	<b>Criteria:</b> 1. According to the answer key, get the maximum score 2. Many matches with the answer key get 50% or more of the maximum score 3. Slight conformity with the answer key gets less than 50% to 10% of the maximum score 4. Answering incorrectly gets a maximum of 9% of the maximum score 5. Not answering gets a score of 0  <b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	a. Discussion and presentation regarding the molecular aspects that occur in the aging process and its consequences 6 X 50		<b>Material:</b> structure of human chromosomes, telomeres, and their role in the process of apoptosis and aging <b>References:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i> . English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i> . New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i> . English: Atria Books  <b>Material:</b> Molecular aspects of the aging process <b>References:</b> Articles from journals	5%
8	UTS		<b>Form of Assessment :</b> Test	2 X 50		<b>Material:</b> All chapters in meetings 1-7 <b>References:</b> (1) Blackburn, E. and Epel, E. 2017. <i>The Telomere Effect</i> . English: Grand Central Publishing. (2) Quadagno, J. 2014. <i>Aging and The Life Course Sixth Edition</i> . New York: McGraw-Hill. Sinclair, D.A. 2019. <i>Life Span</i> . English: Atria Books  <b>Material:</b> All chapters in meetings 1-7 <b>Bibliography:</b> Articles from journals	10%
9	Understanding the structure of human chromosomes, telomeres and their role in the apoptosis process and the aging process	Communicating the structure of human chromosomes Communicating the structure of telomeres Communicating the role of telomeres in the process of apoptosis Communicating the role of telomeres in the aging process	<b>Criteria:</b> According to the answer key, get the maximum score  <b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	Guided discussions and meetings, PjBL assignments: Basic questions, determining the topics raised regarding how to prevent/reduce the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> Articles from journals	5%

10	Understanding the structure of human chromosomes, telomeres and their role in the apoptosis process and the aging process	Communicating the structure of human chromosomes Communicating the structure of telomeres Communicating the role of telomeres in the process of apoptosis Communicating the role of telomeres in the aging process	<b>Criteria:</b> · According to the answer key, get the maximum score  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Guided discussions and meetings, PjBL assignments: 1. Basic questions, determining the topics raised regarding how to prevent/reduce the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects 2. Product planning design: Compile the contents of a systematical review 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> <i>Articles from journals</i>	10%
11	Understanding the structure of human chromosomes, telomeres and their role in the apoptosis process and the aging process	Communicating the structure of human chromosomes Communicating the structure of telomeres Communicating the role of telomeres in the process of apoptosis Communicating the role of telomeres in the aging process	<b>Criteria:</b> · According to the answer key, get the maximum score  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Guided discussions and meetings, PjBL assignments: A. Discussions, assignments B. PjBL: 1. Basic questions, determining the topics raised regarding how to prevent/reduce the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects 2. Product planning design: Compile the contents of the systematical review 3. Schedule of activities and deadlines for collecting articles: schedule for compiling and monitoring, presentations, and deadline for submitting articles 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> <i>Articles from journals</i>	10%

12	Understand how to prevent/reduce the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects	1. Dig up information from scientific study references on inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 2. Produce scientific research papers (articles) on how to inhibit the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 3. Find appropriate journals for submission of scientific papers related to inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects	<b>Criteria:</b> 1. Writing scientific articles 2. Presentation practice  <b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	PjBL discussions and assignments : Monitor the progress of article preparation and peer-review 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> <i>Articles from journals</i>	5%
13	Understand how to prevent/reduce the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects	1. Dig up information from scientific study references on inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 2. Produce scientific research papers (articles) on how to inhibit the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 3. Find appropriate journals for submission of scientific papers related to inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects	<b>Criteria:</b> 1. Writing scientific articles 2. Presentation practice  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	PjBL discussions and assignments : Monitor the progress of article preparation and peer-review 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> <i>Articles from journals</i>	5%

14	Understand how to prevent/reduce the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects	1. Dig up information from scientific study references on inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 2. Produce scientific research papers (articles) on how to inhibit the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 3. Find appropriate journals for submission of scientific papers related to inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects	<b>Criteria:</b> 1. Writing scientific articles 2. Presentation practice  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	PjBL discussions and assignments : Monitor the progress of article preparation and peer-review 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> <i>Articles from journals</i>	0%
15	Understand how to prevent/reduce the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects	1. Dig up information from scientific study references on inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 2. Produce scientific research papers (articles) on how to inhibit the aging process from biological, physiological, psychological, psychosocial and spiritual aspects 3. Find appropriate journals for submission of scientific papers related to inhibiting the aging process from biological, physiological, psychological, psychosocial and spiritual aspects	<b>Criteria:</b> 1. Writing scientific articles 2. Presentation practice  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	PjBL discussions and assignments : 1. Monitor the progress of article preparation and peer-review 2. Test results: provide peer-review input on each article preparation process 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> <i>Articles from journals</i>	5%
16	UAS	Writing scientific articles	<b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	A. Discussion, assignment B. PjBL: 1. Testing results: providing peer-review input on each article preparation process 2. Evaluation: reflection on experience in compiling and submitting systematic reviews 2 X 50		<b>Material:</b> Prevention/reducing the rate of aging from biological, physiological, psychological, psychosocial and spiritual aspects <b>Library:</b> <i>Articles from journals</i>	15%

**Evaluation Percentage Recap: Project Based Learning**

No	Evaluation	Percentage
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1.	Participatory Activities	30.34%
2.	Project Results Assessment / Product Assessment	52.84%
3.	Portfolio Assessment	5.84%
4.	Test	10%
		99.02%

#### 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.