



Universitas Negeri Surabaya
Faculty of Mathematics and Natural Sciences
Biology Undergraduate Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date
Oncology*	4620102138	Study Program Elective Courses	T=2 P=0 ECTS=3.18	6	July 17, 2024
AUTHORIZATION		SP Developer	Course Cluster Coordinator	Study Program Coordinator	
		Firas Khaleyla, S.Si., M.Si.	Dr. Nur Kuswanti, M.Sc.St.	Dr. H. Sunu Kuntjoro, S.Si., M.Si.	

Learning model	Project Based Learning
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Program Learning Outcomes (PLO)	PLO study program that is charged to the course																
PLO-6	Able to apply logical, critical, systematic and innovative thinking in the context of developing or implementing science and/or technology according to their field of expertise.																
PLO-7	Able to work independently and collaboratively, as well as responsibly, in completing various tasks in class, in the laboratory and in the field.																
PLO-11	Able to apply transferable skills in biology to develop ecopreneurship (eco-innovation, eco-opportunity, eco-commitment)																
PLO-13	Able to demonstrate basic knowledge of cell and molecular biology, organismal biology, ecology and evolution to analyze current biological issues																
Program Objectives (PO)																	
PO - 1	Able to demonstrate the latest oncology knowledge to support professional work in the field of biology																
PO - 2	Able to design and conduct oncology experiments, collect, analyze, interpret and document data in assignments in the field of ecology																
PO - 3	Able to demonstrate logical, critical, systematic and innovative thinking in developing or implementing knowledge and technology																
PO - 4	Able to work independently and responsibly as an individual or in a group, and able to work together with colleagues																
PLO-PO Matrix																	
		P.O	PLO-6	PLO-7	PLO-11	PLO-13											
	PO-1																
	PO-2																
	PO-3																
	PO-4																
PO Matrix at the end of each learning stage (Sub-PO)																	
	P.O	Week															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	PO-1																
	PO-2																
	PO-3																
	PO-4																

Short Course Description	This course studies the genome of cancer cells, cells and communication between cells, mechanisms of cell death, cell division, cancer cell metabolism, angiogenesis, stages of cancer development, invasion and metastasis, cancer stem cells, and types of organ cancer. This course is presented through lectures, discussions, paper assignments and presentations.
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References	Main :
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1. Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Edisi kedua. New Jersey: Wiley-Liss.
2. Bozzone DM. 2007. The Biology of Cancer . Causes of Cancer. New York: Chelsea House.
3. DeVita VT, Lawrence TS, dan Rosenberg SA. 2011. Cancer . Principal and Practice of Oncology . Primer of the Molecular Biology of Cancer. Philadelphia: Lippincott Williams & Wilkins.

Supporters:

1. Jurnal Onkologi terbaru

Supporting lecturer

Dr. Nur Kuswanti, M.Sc.St.
 Dr. Raharjo, M.Si.
 Nur Qomariyah, S.Pd., M.Sc.
 Erlin Rakhmad Purnama, S.Si., M.Si.
 Firas Khaleyla, S.Si., M.Si.

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 meaning of oncology and the scope of oncology studies	1. Describe the meaning of oncology 2. Explain the scope of oncology studies	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2. UTS with a weight of 20% 3. Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4. UAS with a weight of 30% <p>Form of Assessment : Participatory Activities</p>	<ol style="list-style-type: none"> 1. Expository 2. Discussion 3. Structured assignment using the small group discussion method 2 X 50 		<p>Material: Scope of oncology study References: <i>DeVita VT, Lawrence TS, and Rosenberg SA. 2011. Cancer . Principal and Practice of Oncology. Primer of the Molecular Biology of Cancer. Philadelphia: Lippincott Williams & Wilkins.</i></p> <hr/> <p>Material: Understanding oncology References: <i>DeVita VT, Lawrence TS, and Rosenberg SA. 2011. Cancer . Principal and Practice of Oncology. Primer of the Molecular Biology of Cancer. Philadelphia: Lippincott Williams & Wilkins.</i></p>	5%

2	Identifying the genome of cancer cells	<p>1. Differentiate the genome of cancer cells and their mutations from normal cells</p> <p>2. Explain the genome characteristics of cancer cells</p>	<p>Criteria:</p> <p>1. Paper assignments are assessed as ASSIGNMENTS with a weight of 30%</p> <p>2. UTS with a weight of 20%</p> <p>3. Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20%</p> <p>4. UAS with a weight of 30%</p> <p>Form of Assessment : Participatory Activities</p>	Expository, discussion 2 X 50		<p>Material: Cancer cell genome and mutations.</p> <p>References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p> <hr/> <p>Material: Identification of cancer cell genomes</p> <p>Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p>	5%
3	Analyze the cell division cycle	<p>1. Explain the mechanism of cell division stages</p> <p>2. Describe the induction of cell division phases</p> <p>3. Analyze the regulation of cell division</p>	<p>Criteria:</p> <p>1. Paper assignments are assessed as ASSIGNMENTS with a weight of 30%</p> <p>2. UTS with a weight of 20%</p> <p>3. Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20%</p> <p>4. UAS with a weight of 30%</p> <p>Form of Assessment : Participatory Activities</p>	Expository, discussion 2 X 50		<p>Material: Mechanism of cell division stages</p> <p>References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p> <hr/> <p>Material: Induction of cell division phase</p> <p>Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <hr/> <p>Material: Regulation of cell division</p> <p>References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p>	5%

4	Analyzing the occurrence of cancer cell division	<ol style="list-style-type: none"> 1. Describe the process of cancer cell division 2. Describe the role of micro RNAs in cancer cell division 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2. UTS with a weight of 20% 3. Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4. UAS with a weight of 30% <p>Form of Assessment : Participatory Activities, Tests</p>	Expository, discussion 2 X 50		<p>Material: Cancer cell division process Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <hr/> <p>Material: The role of micro RNAs in cancer cell division. Reference: <i>Latest Oncology Journal</i></p>	5%
5	Understand communication between cells	<ol style="list-style-type: none"> 1. Describe the signal transduction system 2. Identify sensory components 3. Explain the efficiency and specificity of cell communication 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2. UTS with a weight of 20% 3. Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4. UAS with a weight of 30% <p>Form of Assessment : Participatory Activities, Tests</p>	Expository, discussion 2 X 50		<p>Material: Signal transduction systems References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p> <hr/> <p>Material: Sensory components References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p> <hr/> <p>Material: Efficiency and specificity of cell communication References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p>	5%

6	Understanding programmed cell death (PCD) and tumor necrosis factor (TNF)	<ol style="list-style-type: none"> 1. Analyzing the occurrence of programmed cell death (PCD) in cells 2. Analyzing the role of tumor necrosis factor (TNF) in cells 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2. UTS with a weight of 20% 3. Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4. UAS with a weight of 30% <p>Form of Assessment : Participatory Activities, Tests</p>	Expository, discussion 2 X 50		<p>Material: Programmed cell death</p> <p>References: <i>DeVita VT, Lawrence TS, and Rosenberg SA. 2011. Cancer . Principal and Practice of Oncology. Primer of the Molecular Biology of Cancer. Philadelphia: Lippincott Williams & Wilkins.</i></p> <hr/> <p>Material: Tumor necrosis factors</p> <p>References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p>	5%
7	Understanding cell death	<ol style="list-style-type: none"> 1. Explain apoptosis 2. Explain necrosis 3. Identifying autophagy mechanisms in cancer cells 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2. UTS with a weight of 20% 3. Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4. UAS with a weight of 30% <p>Form of Assessment : Participatory Activities, Tests</p>	Expository, discussion 2 X 50		<p>Material: Apoptosis</p> <p>Bibliography: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p> <hr/> <p>Material: Necrosis</p> <p>Bibliography: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p> <hr/> <p>Material: Mechanism of cancer cell autophagy</p> <p>Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p>	5%

8	UTS	UTS	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2.UTS with a weight of 20% 3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4.UAS with a weight of 30% <p>Form of Assessment : Participatory Activities, Tests</p>	Test 2 X 50		10%
9	Understanding cancer cell metabolism	<ol style="list-style-type: none"> 1.Explain the metabolism of cancer cells 2.Identifying the energetics of cancer cell proliferation 3.Explain metabolism for cancer treatment 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2.UTS with a weight of 20% 3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4.UAS with a weight of 30% <p>Form of Assessment : Participatory Activities</p>	Expository, discussion 2 X 50	<p>Material: Cancer cell metabolism Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <p>-----</p> <p>Material: Energetics of cancer cell proliferation Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <p>-----</p> <p>Material: Metabolism for cancer treatment Reference: <i>Latest Oncology Journal</i></p>	5%

10	Understanding the process of angiogenesis in body tissue	<ol style="list-style-type: none"> 1.Explain the initial process of blood vessel formation 2.Identifying angiogenesis of tumors and normal cells 3.Describe modulators of tumor angiogenesis 4.Describe endogenous inhibitors of tumor angiogenesis 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2.UTS with a weight of 20% 3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4.UAS with a weight of 30% <p>Form of Assessment : Participatory Activities, Tests</p>	Expository, discussion 2 X 50		<p>Material: Initial process of blood vessel formation. References: <i>Bolsover SR, Hyams JS, Shepard EA, White HA, Wiedeman CG. 2004. Cell Biology. A Short Course. Second edition. New Jersey: Willey-Liss.</i></p> <hr/> <p>Material: Tumor angiogenesis Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <hr/> <p>Material: Tumor angiogenesis modulator Reference: <i>Latest Oncology Journal</i></p> <hr/> <p>Material: Endogenous inhibitors of tumor angiogenesis. Reference: <i>Latest Oncology Journal</i></p>	5%
11	Identifying the stages of cancer cell development	· Identify the stages of cancer cell development	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2.UTS with a weight of 20% 3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4.UAS with a weight of 30% <p>Form of Assessment : Participatory Activities</p>	Expository, discussion 2 X 50		<p>Material: Stages of cancer cell division Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p>	5%

12	Understanding cancer cell invasion and metastasis	<p>1.Explain the process of cancer cell invasion</p> <p>2.Describe cancer cell metastasis</p>	<p>Criteria:</p> <p>1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30%</p> <p>2.UTS with a weight of 20%</p> <p>3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20%</p> <p>4.UAS with a weight of 30%</p> <p>Form of Assessment : Participatory Activities, Tests</p>	Expository, discussion 2 X 50		<p>Material: Cancer cell invasion</p> <p>References: <i>DeVita VT, Lawrence TS, and Rosenberg SA. 2011. Cancer . Principal and Practice of Oncology. Primer of the Molecular Biology of Cancer. Philadelphia: Lippincott Williams & Wilkins.</i></p> <hr/> <p>Material: Cancer cell metastasis</p> <p>References: <i>DeVita VT, Lawrence TS, and Rosenberg SA. 2011. Cancer . Principal and Practice of Oncology. Primer of the Molecular Biology of Cancer. Philadelphia: Lippincott Williams & Wilkins.</i></p>	5%
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13	Understanding about cancer stem cells	<ol style="list-style-type: none"> 1.Explain tumor heterogeneity 2.Explain the beginnings of cancer stem cells 3.Describe leukemia stem cells 4.Describe cancer stem cells in solid tumors 5.Distinguishing genetic diversity and clonal evolution in cancer 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2.UTS with a weight of 20% 3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4.UAS with a weight of 30% <p>Form of Assessment : Participatory Activities</p>	Expository, discussion 2 X 50		<p>Material: Tumor heterogeneity Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <hr/> <p>Material: Early cancer stem cells Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <hr/> <p>Material: Leukemia stem cells Reference: <i>Bozzone DM. 2007. The Biology of Cancer. Causes of Cancer. New York: Chelsea House.</i></p> <hr/> <p>Material: Cancer stem cells in solid tumors Reference: <i>Latest Oncology Journal</i></p> <hr/> <p>Material: Genetic diversity and clonal evolution in cancer. Reference: <i>Latest Oncology Journal</i></p>	0%
14	Understanding the types of human body cancer	Identify common types of cancer in the body: Lung cancer Liver cancer Breast cancer Pancreatic cancer Colorectal cancer	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2.UTS with a weight of 20% 3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4.UAS with a weight of 30% <p>Form of Assessment : Participatory Activities</p>	Small group discussion: students carry out case studies on various types of cancer and the mechanisms of development of each type of cancer Presentation of discussion results 2 X 50		<p>Material: Types of cancer in humans Reference: <i>Latest Oncology Journal</i></p> <hr/> <p>Material: Mechanisms of development of various types of cancer in humans. Reference: <i>Latest Oncology Journal</i></p>	10%

15	Understanding cancer treatment therapy in humans	<ol style="list-style-type: none"> 1.Explain the mechanism of action of chemotherapy in cancer 2.Explain the mechanism of action of radiation on cancer 3.Explain the use of small molecule kinase inhibitors 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Paper assignments are assessed as ASSIGNMENTS with a weight of 30% 2.UTS with a weight of 20% 3.Student activities and responses during learning activities, especially presentations, are assessed as PARTICIPATION with a weight of 20% 4.UAS with a weight of 30% <p>Form of Assessment : Participatory Activities</p>	Small group discussion: students carry out case studies on various types of therapy or treatment for various types of cancer Presentation of discussion results 2 X 50	<p>Material: Mechanism of action of various cancer therapy methods. Reference: <i>Latest Oncology Journal</i></p> <hr/> <p>Material: Use of small molecule kinase inhibitors Reference: <i>Latest Oncology Journal</i></p> <hr/> <p>Material: Cancer prevention lifestyle Reference: <i>Latest Oncology Journal</i></p>	10%
16		Test	<p>Criteria: Test</p> <p>Form of Assessment : Test</p>	End of semester evaluation		15%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	65%
2.	Test	35%
		100%

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.