

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

Document Code

SEMESTER LEARNING PLAN

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Courses			CODE			C	ours	se Fai	mily		C	Cred	it We	eight		S	EMEST	ΓER	Co Da	mpilati te	ion
Biophysics			8420103018	3							Т	[=3	P=0	EC	TS=4.77	7	2	2	Jul	y 18, 20	024
AUTHORIZAT	ION		SP Develop	er						Co	urse	Clu	ster (Coord	dinator	St	udy P	rograr	n Coo	rdinato	or
																	Prof. Dr. Erman, M.Pd.				
Learning model	Case Studies									1											
Program	PLO study pro	gram t	hat is charę	ged t	o the	cours	se														
Outcomes (PLO)	PLO-11	Desig data	In and condu	ct res	earch	about	lear	ning o	of inte	egrat	ed sc	ienc	e, an	d acq	luire, an	alyze	e, and	interpr	et the	researc	ch
	Program Objec	tives ((PO)																		
	PO - 1	Able t	o use ICT to	analy	ze pro	oblems	s of r	natter	, mot	ion a	nd er	nerg	y (cal	culati	ions and	d ma	king gr	raphs).			
	PO - 2	Maste be ab	er the concept le to formulat	ts, pri e the	inciple m to s	es and solve p	laws roble	s of m ems ir	atter, 1 ever	moti yday	on ar / life.	nd ei	nergy	in te	rms of p	ohysi	cs, bio	logy a	nd che	mistry a	and
	PO - 3	Able t physic of scie	to carry out s cs, biology ar ence. Respor	simple nd cho nsible	e rese emistr for le	arch o ry so th cture a	n th nat it issig	e Mot can l nmer	tion a be us its an	nd C ed to d pre	hang prov parir	je of vide ng pr	f an c vario actici	object us alt um re	in a co ternative sults re	ompro e sol ports	ehensi utions 3.	ve ma to prol	nner, i blems	n terms in the f	s of ield
	PLO-PO Matrix		•									•.									
		[
			P.0		PLC	D-11															
			PO-1																		
			PO-2																		
			PO.3																		
			100																		
	PO Matrix at th	e end	of each lea	rning	g stag	ge (Su	b-P	0)													
			P.O									W	/eek								
				1	2	3	4	5	6	7	8	ç	9 1	10	11	12	13	14	15	16	
		PC	D-1																		
		PC)-2																		
		PC	0-3																		
				1	1	II		1			1				l			L	L		
Short Course Description	Discussion of cr properties of cells out with modeling	oss-dis s, struc j, prese	ciplinary sub ture and dyna entations and	jects amics discu	of bi s of bi ussion	ology omolec IS.	and cules	phys s, env	ics in ironm	livir ienta	ng cr I biop	eatu bhys	ics, a	and th nd m	heir env ethods	/ironi in bio	ment, ophysio	includi cs. Lec	ng the tures a	electr are carı	ical ried
References	Main :																				
	 Kappen, Nölting E Tuszynsi Waigh, T Carl J. I Associat Duane K Lubert, S 	Bert. 2 Sengt. 2 Som A Payton Son of S nudsor Styer. 20	008. Introduc 2006. Method 2. A., dan Kurz 2007. Applie and Roger Sport and Exe 1. 2019. Fund 000. Biokomi	tion t s in M zynski d Bio M. B ercise lamer a Vol	o Biop Aodern i, Mich physio artlett Scier ntals c I Edis	ohysics n Bioph nal. 200 cs . Loc . 2008 nces G of Biom si 4. Ja	s, Ha nysio 03. I ndor 3. Bio uide uide karta	andou cs. Be ntrodu n: Joh omecl line anics a: EG	t. Rac rlin: S uction n Wil- nanica . New C.	Ibou Sprin to N ey ai al Ev al Ev	d Uni ger. Ioleci nd So /alua /k: Sp	vers ular ons, tion oring	ity Ni Bioph Ltd. of M er.	jmege nysics lovem	en. s. Londo nent in	on: C Spo	RC Pri	ess. Exerc	ise . 1	⁻ he Bri	tish
	Supporters:																				

Support lecturer	ting	Prof.Dr. Wahono Dr. Mohammad B An Nuril Maulida I Dhita Ayu Permat Aris Rudi Purnom Fasih Bintang Ilha Dyah Permata Sa	Widodo, M.Si. udiyanto, S.Pd., M.I Fauziah, S.Pd., M.P a Sari, S.Pd., M.Pd. o, S.Si., M.Pd., M.S ami, S.Kep., M.T., Pl rri, S.Pd., M.Pd.	Pd. d. h.D.			_	
Week-	Fina eacl stag	l abilities of 1 learning 1e	Ev	aluation	H Lea Stude [E	elp Learning, rning methods, ent Assignments, stimated time]	Learning materials	Assessment Weight (%)
	(Sul	o-PO)	Indicator	Criteria & Form	Offline(offline)	Online (<i>online</i>)		
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Util lea and to a ma train mo and mo thir app eve	izing ICT-based rning resources d learning media analyze the gnitude of nslational motion d curvilinear tion (rotation) d rotation) in the tion of living hgs and their plication in eryday life	 Analyzing the magnitude of translational movement in living things through case studies and graphs Analyzing the magnitude of curved motion (rotation and rotation) in living things through case studies and graphs Apply the concept of translational and curvilinear motion (rotation and rotation) to the motion of living creatures 	Criteria: Accurate understanding and analysis of translational motion and curvilinear motion (rotation and rotation) in the motion of living creatures and their application in everyday life. Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 × 50 discussions		Material: Translational and curvilinear motion (projection and rotation) in the Motion of Living Creatures References: Kappen, Bert. 2008. Introduction to Biophysics, Handout. Radboud University Nijmegen. Material: Translational and curvilinear motion (rotation and rotation) in the Motion of Living Creatures Reference: Nölting Bengt. 2006. Methods in Modern Biophysics. Berlin: Springer. Material: Translational and curvilinear motion (rotation and rotation) in the Motion of Living Creatures References: Tuszynski, Jack A., and Kurzynski, Jack A., and Kurzynski, Michal. 2003. Introduction to Molecular Biophysics. London: CRC Press. Material: Translational and curvilinear motion (rotation and rotation) in the movement of living creatures. Reference: Waigh, Tom A 2007. Applied Biophysics. London: John Wiley and Sons, Ltd.	5%

2	Utilizing ICT-based learning resources	1.Analyzing	Criteria:	Flip	-	Material:	10%
	and learning media to analyze the	magnitude of	understanding and analysis of	student-		and curvilinear	
	magnitude of translational motion	translational movement in	translational motion	and		(projection and	
	and curvilinear	living things	(rotation and rotation)	3 X 50		rotation) in the	
	and rotation) in the	through case	creatures and their	uiscussions		Creatures	
	motion of living things and their	graphs	application in everyday life			References:	
	application in	2.Analyzing	everyddy me.			карреп, веп. 2008.	
	everyday me	the magnitude of	Form of Assessment : Participatory Activities			Introduction to	
		curved				Handout.	
		motion				Radboud	
		(rotation and rotation) in				University Nijmegen.	
		living things					
		through case				Material: Translational	
		graphs				and curvilinear	
		3.Apply the				motion (rotation and rotation) in	
		concept of translational				the Motion of	
		and				Living Creatures	
		curvilinear				Nölting Bengt.	
		(rotation and				2006. Methods in Modern	
		rotation) to				Biophysics.	
		the motion of living				Berlin: Springer.	
		creatures				Material:	
						Translational	
						motion (rotation	
						and rotation) in	
						Living Creatures	
						References:	
						A., and	
						Kurzynski, Michal 2003	
						Introduction to	
						Molecular Biophysics	
						London: CRC	
						Press.	
						Material:	
						Translational and curvilinear	
						motion (rotation	
						and rotation) in the movement	
						of living	
						creatures. Reference:	
						Waigh, Tom A	
						2007. Applied Biophysics.	
						London: John	
						Ltd.	

	and learning media to analyze the magnitude of translational motion and curvilinear motion (rotation) in the motion of living things and their application in everyday life	the magnitude of translational movement in living things through case studies and graphs 2.Analyzing the magnitude of curved motion (rotation and rotation) in living things through case studies and graphs 3.Apply the concept of translational and curvilinear motion (rotation and rotation) to the motion of living creatures	Accurate understanding and analysis of translational motion and curvilinear motion (rotation and rotation) in the motion of living creatures and their application in everyday life. Form of Assessment : Participatory Activities	learning, student- centered, and 3 X 50 discussions		Translational and curvilinear motion (projection and rotation) in the Motion of Living Creatures References: <i>Kappen, Bert.</i> 2008. Introduction to Biophysics, Handout. Radboud University Nijmegen. Material: Translational and curvilinear motion (rotation and rotation) in the Motion of Living Creatures Reference: Nölting Bengt. 2006. Methods in Modern Biophysics. Berlin: Springer. Material: Translational and curvilinear motion (rotation and rotation) in the Motion of Living Creatures References: Tuszynski, Jack A., and Kurzynski, Michal. 2003. Introduction to Molecular Biophysics. London: CRC Press. Material: Translational and curvilinear motion (rotation and rotation) in the movement of living creatures. Reference: Waigh, Tom A 2007. Applied Biophysics. London: John Wiley and Sons, Ltd.	
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	and learning media to understand human movement systems and their application in everyday life	 passive movement in humans 2.Describe the molecular components of 3.Describe the role of three proteins in muscle contraction 4.Describe the work of skeletal muscles 5.Distinguish between types of joints 6.Distinguish between various types of movement 	Accurate understanding and analysis related to the concept of movement systems in humans and its application in everyday life. Form of Assessment : Participatory Activities	learning, student- centered, and 3 X 50 discussions		Human movement system and its application in everyday life Reader: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer. Material: Human movement system and its application in everyday life. Reference: Carl J. Payton and Roger M. Bartlett. 2008. Biomechanical Evaluation of Movement in Sport and Exercise. The British Association of Sport and Exercise. The British Association of Sport and Exercise. The British Association of Sport and Exercise. Guideline Material: Human movement system and its application in everyday life References: Hamill, J. & Knutzen, KM. 2003. Biomechanical Basis of Human Movement. Second Edition. Philadelphia: Lippincott Wilkins	
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5	Utilizing ICT-based learning resources and learning media to understand human movement systems and their application in everyday life	 Describe passive movement in humans Describe the molecular components of sarcomeres Describe the role of three proteins in muscle contraction Describe the work of skeletal muscles Distinguish between types of joints Distinguish between various types of movement 	Criteria: Accurate understanding and analysis related to the concept of movement systems in humans and its application in everyday life. Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions	Material: Human movement system and its application in everyday life Reader: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer. Material: Human movement system and its application in everyday life. Reference: Carl J. Payton and Roger M. Bartlett. 2008. Biomechanical Evaluation of Movement in Sport and Exercise. The British Association of Sport and Exercise. The British Association of Sport and Exercise. The British Association of Sport and Exercise. Sciences Guideline Material: Energy and its use in living	5%
					things References: Lubert, Styer. 2000. Biokomia Vol I Edition 4. Jakarta: EGC.	
6	Utilize ICT-based learning resources and learning media to understand the concept of energy and its use in living things	 Explain the process of forming ATP in the electron transport chain Analyzing the energy content of food and its conversion to meet the body's movement needs Explain the concept of anaerobic energy acquisition. 	Criteria: Accurate understanding of the formation of ATP and ADP and energy conversion in food. Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions	Matter: Energy and its use in living things. Reference: Carl J. Payton and Roger M. Bartlett. 2008. Biomechanical Evaluation of Movement in Sport and Exercise. The British Association of Sport and Exercise Sciences Guideline Material: Energy and its use in living things References: Lubert, Styer. 2000. Biokomia Vol I Edition 4. Jakarta: EGC.	10%

7	Utilize ICT-based learning resources and learning media to understand the concept of energy and its use in living things	 Explain the process of forming ATP in the electron transport chain Analyzing the energy content of food and its conversion to meet the body's movement needs Explain the concept of anaerobic energy acquisition. 	Criteria: Accurate understanding of the formation of ATP and ADP and energy conversion in food Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions		Matter: Energy and its use in living things. Reference: Carl J. Payton and Roger M. Bartlett. 2008. Biomechanical Evaluation of Movement in Sport and Exercise. The British Association of Sport and Exercise Sciences Guideline Material: Energy and its use in living things References: Lubert, Styer. 2000. Biokomia Vol I Edition 4. Jakarta: EGC. Matter: Energy and its use in living things. Reference: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer.	10%
8	Utilize ICT-based learning resources and learning media to understand the concept of energy and its use in living things	Explain the process of forming ATP in the electron transport chain	Criteria: Accurate understanding of the formation of ATP and ADP and energy conversion in food Form of Assessment : Participatory Activities, Tests	Midterm Exam 3 X 50	-	Matter: Energy and its use in living things. Reference: Carl J. Payton and Roger M. Bartlett. 2008. Biomechanical Evaluation of Movement in Sport and Exercise. The British Association of Sport and Exercise Sciences Guideline Material: Energy and its use in living things References: Lubert, Styer. 2000. Biokomia Vol I Edition 4. Jakarta: EGC. Matter: Energy and its use in living things. Reference: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer.	0%

9	Utilizing ICT-based learning resources and learning media to understand the kinematics of linear motion and its application everyday life.	Distinguish between linear, angular and general motion	Criteria: Accuracy and understanding between linear, angular and general motion. Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions		Material: Linear motion kinematics and its application in everyday life Reader: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer. Material: Linear motion kinematics and its application in everyday life References: Kappen, Bert. 2008. Introduction to Biophysics, Handout. Radboud University Nijmegen. Material: Linear motion kinematics and its application in everyday life References: Tuszynski, Jack A., and Kurzynski, Michal. 2003. Introduction to Molecular Biophysics. London: CRC Press.	5%
10	Utilizing ICT-based learning resources and learning media to understand the kinematics of angular motion and its application in everyday life.	Explain how the moment of inertia of the human body can be manipulated	Criteria: Accuracy and understanding of how the moment of inertia of the human body works Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions	-	Material: Kinematics of angular motion and its application in everyday life. Reference: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer. Material: Kinematics of angular motion and its application in everyday life References: Kappen, Bert. 2008. Introduction to Biophysics, Handout. Radboud University Nijmegen. Material: Kinematics of angular motion and its application in everyday life References: Kappen, Bert. 2008. Introduction to Biophysics, Handout. Radboud University Nijmegen. Material: Kinematics of angular motion and its application in everyday life Reference: Waigh, Tom A 2007. Applied Biophysics. London: John Wiley and Sons, Ltd.	10%

Other Least and the	America			Ι		
Students can apply energy sources and alternative energy in the field of biology.	Applying energy sources and alternative energy (Including EFL experiments on solar cells) in the field of biology	Criteria: Accuracy and understanding of energy sources and alternative energy (including EFL experiments on solar cells) in the field of biology Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 × 50 discussions		Material: Energy sources and alternative energy in the field of biology References : <i>Lubert, Styer.</i> 2000. Biokomia Vol I Edition 4. Jakarta: EGC. Material: Energy sources and alternative energy in the field of biology References : Kappen, Bert. 2008. Introduction to Biophysics, Handout. Radboud University Nijmegen. Material: Energy sources and alternative energy in the field of biology Reference : Waigh, Tom A 2007. Applied Biophysics. London: John Wiley and Sons, Ltd. Material: Energy sources and alternative energy in the field of biology Reference : Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer.	5%
					Fundamentals of Biomechanics. New York: Springer. Material: Energy sources and alternative energy in the field of biology References: M Budiyanto, M Yasin. 2017. Cholesterol detection using optical fiber sensor based on intensity modulation. Journal of Physics: Conference Series	
	Students can apply energy sources and alternative energy in the field of biology.	Students can apply energy sources and alternative energy in the field of biology.	Students can apply energy sources and alternative energy in the field of biology. Applying energy sources and alternative energy (including EFL experiments on solar cells) in the field of biology Criteria: Accuracy and understanding of energy sources and alternative energy (including EFL experiments on solar cells) in the field of biology Form of Assessment : Participatory Activities	Students can apply energy sources and alternative elegy (including EFL oslar cells) in the field of biology.	Students can apply ornergy sources and alternative energy in the field of biology.	Students can appy and identative entry in the field of biology Criteria: Successful additional entry in the field of biology Fip is acriteria: contents on approximate of biology Fip is acriteria: biology Fip is acriteria: contents on approximate on approximate on biology Fip is acriteria: contents on approximate on approximate on biology Fip is acriteria: contents on approximate on biology Fip is acriteria: contents on bio

12	Students can apply energy sources and alternative energy in the field of biology.	Applying energy sources and alternative energy (Including EFL experiments on solar cells) in the field of biology	Criteria: Accuracy and understanding of energy sources and alternative energy (including experiments on solar cells) in the field of biology Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions	Material: Energy sources and alternative energy in the field of biology References : <i>Lubert, Styer.</i> 2000. <i>Biokomia</i> Vol I Edition 4. Jakarta: EGC. Material: Energy sources and alternative energy in the field of biology Reference : Waigh, Tom A 2007. Applied Biophysics. London: John Wiley and Sons, Ltd. Material: Energy sources and alternative energy in the field of biology References : <i>FB</i> Ilhami, M Budiyanto. 2023. The Characterization of Salt Level in Mango Fruit Through the Principle of Refraction Index. Science Education and Application Journal Material: Energy sources and alternative energy in the field of biology References : <i>M</i> Budiyanto, M Yasin. 2017. Cholesterol detection using optical fiber sensor based on intensity modulation.	10%
					optical fiber sensor based on intensity modulation. Journal of Physics: Conference Series	

12	Students can apply	Annlying the	Critoria	Elin	Matorial	E04
13	Students can apply the concepts of the properties of substances and thermodynamics in the field of biology	Applying the concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology	Criteria: Accuracy and understanding of the concepts of substance properties (liquid, gas, and plasma), and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions	Material: Concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. References: <i>Kappen, Bert.</i> 2008. <i>Introduction to</i> <i>Biophysics,</i> <i>Handout.</i> <i>Radboud</i> <i>University</i> <i>Nijmegen.</i> Matter: Concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Waigh, Tom A</i> 2007. Applied <i>Biophysics.</i> <i>London: John</i> <i>Wiley and Sons,</i> <i>Ltd.</i> Matter: Concepts of the nature of substances (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Waigh, Tom A</i> 2007. Applied <i>Biophysics.</i> <i>London: John</i> <i>Wiley and Sons,</i> <i>Ltd.</i> Matter: Concepts of the nature of substances (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Duane</i> <i>Knudson.</i> 2019. <i>Fundamentals</i> <i>of</i> <i>Biomechanics.</i> <i>New York:</i> <i>Springer.</i>	5%

14	Students can apply the concepts of the properties of substances and thermodynamics in the field of biology	Applying the concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology	Criteria: 1.Accuracy and understanding of the concepts of substance properties (liquid, gas, and plasme changes, temperature, heat, expansion, and thermodynamics in the field of biology 2.biology. Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions		Material: concepts of substance properties and thermodynamics in the field of biology References: <i>Kappen, Bert.</i> 2008. Introduction to Biophysics, Handout. Radboud University Nijmegen. Material: concepts of substance properties and thermodynamics in the field of biology Reference: Waigh, Tom A 2007. Applied Biophysics. London: John Wiley and Sons, Ltd. Material: concepts of substance properties and thermodynamics in the field of biology. Reference: Waigh, Tom A 2007. Applied Biophysics. London: John Wiley and Sons, Ltd. Material: concepts of substance properties and thermodynamics in the field of biology. Reference: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer.	5%
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15	Students can apply the concepts of the properties of substances and thermodynamics in the field of biology	Applying the concepts of substance properties (liquid, gas, and plasma), and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology	Criteria: Accuracy and understanding of the concepts of substance properties (liquid, gas, and plasma), and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Form of Assessment : Participatory Activities	Flip learning, student- centered, and 3 X 50 discussions	Material: concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Kappen, Bert.</i> 2008. <i>Introduction to</i> <i>Biophysics,</i> <i>Handout.</i> <i>Radboud</i> <i>University</i> <i>Nijmegen.</i> Matter: concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Waigh, Tom A</i> 2007. <i>Applied</i> <i>Biophysics.</i> <i>London: John</i> <i>Wiley and Sons,</i> <i>Ltd.</i> Material: concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Waigh, Tom A</i> 2007. <i>Applied</i> <i>Biophysics.</i> <i>London: John</i> <i>Wiley and Sons,</i> <i>Ltd.</i>	10%
					Material: concepts of substance properties (liquid, gas, and plasma), and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer.	

16	Students can apply the concepts of the proportion of	Applying the concepts of	Criteria: Accuracy and	3 X 50	-	Material: concepts of	0%
16	Students can apply the concepts of the properties of substances and thermodynamics in the field of biology	Applying the concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology	Criteria: Accuracy and understanding of the concepts of substance properties (liquid, gas, and plasma), and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Form of Assessment : Participatory Activities, Tests	3 X 50 Semester Final Exam		Material: concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Kappen, Bert.</i> 2008. <i>Introduction to</i> <i>Biophysics,</i> <i>Handout.</i> <i>Radboud</i> <i>University</i> <i>Nijmegen.</i> Matter: concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and thermodynamics in the field of biology. Reference: <i>Waigh, Tom A</i> 2007. <i>Applied</i> <i>Biophysics.</i> <i>London: John</i> <i>Wiley and Sons,</i> <i>Ltd.</i> Material: concepts of substance properties (liquid, gas, and phase changes, temperature, heat, expansion, and the field of biology. Reference: <i>Waigh, Tom A</i> 2007. <i>Applied</i> <i>Biophysics.</i> <i>London: John</i> <i>Wiley and Sons,</i> <i>Ltd.</i>	0%
						(liquid, gas, and plasma), and phase changes, temperature, heat, expansion, and thermodynamics in the field of	
						Diology. Reference: Duane Knudson. 2019. Fundamentals of Biomechanics. New York: Springer.	

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	100%
		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.
 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. Subject Sub-PO (Sub-PO) is a capability that is specifically described from the PO that can be measured or observed and is
- 4. 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.