



**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
Basic mathematic	4620102197		T=2   P=0   ECTS=3.18	1	July 17, 2024
AUTHORIZATION	SP Developer		Course Cluster Coordinator		Study Program Coordinator
	.....		.....		Dr. H. Sunu Kuntjoro, S.Si., M.Si.

Learning model	Project Based Learning
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Program Learning Outcomes (PLO)	<b>PLO study program that is charged to the course</b>																		
	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-12	Able to demonstrate basic knowledge of biology relevant to science and mathematics to understand current scientific phenomena and issues and apply them in problem solving																	
	<b>Program Objectives (PO)</b>																		
	PO - 1	Apply the concepts of number sequences and series, probability, functions, function derivatives, function integrals, and their applications to solve problems logically, critically, systematically, and innovatively with responsibility and independence																	
	PO - 2	Able to work independently and collaboratively, as well as being responsible, in completing various tasks on number sequences and series, probability, functions, function derivatives, function integrals, and their applications																	
	PO - 3	apply logical, critical, systematic, and innovative thinking in the concept of sequences and series of numbers, probability, functions, derivatives of functions, integrals of functions, and their applications																	
	<b>PLO-PO Matrix</b>																		
		<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">P.O</th> <th style="padding: 5px;">PLO-6</th> <th style="padding: 5px;">PLO-7</th> <th style="padding: 5px;">PLO-12</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">PO-1</td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> </tr> <tr> <td style="padding: 5px;">PO-2</td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> </tr> <tr> <td style="padding: 5px;">PO-3</td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> </tr> </tbody> </table>			P.O	PLO-6	PLO-7	PLO-12	PO-1				PO-2				PO-3		
P.O	PLO-6	PLO-7	PLO-12																
PO-1																			
PO-2																			
PO-3																			

**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																		

Short Course Description	Examines equations and inequalities, function concepts, probability theory, matrices, limits, differentials, integrals and their applications.
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References	<b>Main :</b>	
		1. Purcell, E. J. et al. 2010. Kalkulus Jilid I Edisi 8 (Terjemahan). Jakarta: Erlangga.
	<b>Supporters:</b>	

1. Adams, R. A. dan Essex, C. 2018. Calculus: A Complete Course (9th Edition). Toronto: Pearson.
2. Hass, J., et all, 2018. Thomas' Calculus 14th Edition. USA: Addison-Wesley Publishing Company.
3. Hass, J., et all. 2020. University Calculus: Early Transcendentals (4th Edition). Boston: Pearson.
4. Stewart, J., et all. 2021. Calculus Metric Version: Early Transcendental (9th Edition). Cengage Learning.
5. Sulaiman, R. 2015. Integral dan Aplikasinya. Surabaya: Zifatama.

**Supporting lecturer**  
 Dr. Endah Budi Rahaju, M.Pd.  
 Dr. Ismail, M.Pd.  
 Abdul Haris Rosyidi, S.Pd., M.Pd.  
 Ika Kurniasari, S.Pd., M.Pd.  
 Nurus Saadah, S.Pd., M.Pd.  
 Dr. Nonik Indrawatiningsih, M.Pd.  
 Evangelista Lus Windyana Palupi, S.Pd., M.Sc.  
 Nina Rinda Prihartiwi, S.Pd., M.Pd.  
 Dr. Yurizka Melia Sari, M.Pd.

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 equality and inequality	1.Determine the solution to the equation 2.Determine the solution to the inequality 3.Solve problems related to equations/inequalities	<b>Form of Assessment :</b> Participatory Activities	Expository, discussion and assignment 2 X 50			7%
2	Understand the concept of equality and inequality	1.Determine the solution to the equation 2.Determine the solution to the inequality 3.Solve problems related to equations/inequalities	<b>Form of Assessment :</b> Participatory Activities	Expository, discussion and assignment 2 X 50			7%
3	Understand the basic theory of probability	1.Determine the permutation and combination values 2.Determining the sample space of an event 3.Determining the probability of an event	<b>Form of Assessment :</b> Participatory Activities	expository, discussion and assignment 2 X 50			7%
4	Understand the basic theory of probability	1.Determine the permutation and combination values 2.Determining the sample space of an event 3.Determining the probability of an event	<b>Form of Assessment :</b> Participatory Activities, Tests	expository, discussion and assignment 2 X 50			7%
5	Understand the derivatives of algebraic, trigonometric and exponential functions.	1.Determine the origin area, function result area and function value 2.Draw function graphs 3.Determining the limit of a function at a certain point 4.Investigating continuity of function	<b>Form of Assessment :</b> Participatory Activities, Tests	expository, discussion and assignment 2 X 50			7%
6	Understand the concept of functions and function limits	1.Determine the origin area, function result area and function value 2.Draw function graphs 3.Determining the limit of a function at a certain point 4.Investigating continuity of function	<b>Form of Assessment :</b> Participatory Activities, Tests	expository, discussion and assignment 2 X 50			7%

7	Understand the derivatives of algebraic, trigonometric and exponential functions.	<ol style="list-style-type: none"> <li>Determine the origin area, function result area and function value</li> <li>Draw function graphs</li> <li>Determining the limit of a function at a certain point</li> <li>Investigating continuity of function</li> </ol>	<b>Form of Assessment :</b> Test	expository, discussion and assignment 2 X 50			7%
8				UTS 2 X 50			0%
9	Understand Integral concepts.	<ol style="list-style-type: none"> <li>Determining the derivative of an algebraic function</li> <li>Determine derivatives of trigonometric functions</li> <li>Determine the derivative of the exponential function</li> </ol>	<b>Form of Assessment :</b> Participatory Activities	Expository, discussion and assignments. 2 X 50			7%
10	Understand the concept of derivatives and their applications	<ol style="list-style-type: none"> <li>Determining the derivative of an algebraic function</li> <li>Determine derivatives of trigonometric functions</li> <li>Determine the derivative of the exponential function</li> <li>Solve problems related to derivatives of functions</li> </ol>	<b>Form of Assessment :</b> Participatory Activities	expository and discussion 2 X 50			7%
11	<ol style="list-style-type: none"> <li>Understand the concept of derivatives and their applications</li> <li>Determine derivatives of trigonometric functions</li> <li>Determine the derivative of the exponential function</li> <li>Solve problems related to derivatives of functions</li> </ol>	Determining the indefinite integral of a function - using the substitution integration technique Determining the results of a definite integral.	<b>Form of Assessment :</b> Participatory Activities, Tests	expository and discussion 2 X 50			7%
12	Understand Integral concepts and their applications	Determining the indefinite integral of a function	<b>Form of Assessment :</b> Test	expository, discussion and assignment 2 X 50			7%
13	Understand Integral concepts and their applications	Determine the result of a definite integral	<b>Form of Assessment :</b> Participatory Activities, Tests	expository, discussion and assignment 2 X 50			7%
14	Understand Integral concepts and their applications	Solve problems related to integrals	<b>Form of Assessment :</b> Practical Assessment, Test	Assignment 2 X 50			8%
15	Understand Integral concepts and their applications	Solve problems related to integrals	<b>Form of Assessment :</b> Test	Assignment 2 X 50			8%
16			<b>Form of Assessment :</b> Test	UAS			0%

#### Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	52.5%
2.	Practical Assessment	4%
3.	Test	43.5%
		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.