



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

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date																																																																			
Basic mathematic	8420402323		T=2 P=0 ECTS=3.18	1	July 17, 2024																																																																			
AUTHORIZATION	SP Developer		Course Cluster Coordinator	Study Program Coordinator																																																																				
	Prof. Dr. Utiya Azizah, M.Pd.																																																																				
Learning model	Case Studies																																																																							
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																																																							
	PLO-5	Able to make decisions based on data/information in order to complete tasks that are their responsibility and evaluate performance that has been carried out both individually and in groups, has an entrepreneurial spirit with an environmental perspective (CPL 7)																																																																						
	PLO-7	Applying logical, critical, systematic and innovative thinking in the context of the development or implementation of science, technology and art that pays attention to and applies humanities values appropriate to the field of chemistry education in solving problems (CPL 5)																																																																						
	PLO-11	Able to demonstrate knowledge related to theoretical concepts about structure, dynamics and energy, as well as basic principles of separation, analysis, synthesis and characterization of chemicals (CPL 1)																																																																						
	Program Objectives (PO)																																																																							
	PO - 1	Able to demonstrate mathematical knowledge and insight.																																																																						
	PO - 2	Able to implement basic mathematical principles to solve simple mathematical problems																																																																						
	PLO-PO Matrix																																																																							
		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>P.O</th> <th>PLO-5</th> <th>PLO-7</th> <th>PLO-11</th> </tr> </thead> <tbody> <tr> <td>PO-1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PO-2</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					P.O	PLO-5	PLO-7	PLO-11	PO-1				PO-2																																																									
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PO Matrix at the end of each learning stage (Sub-PO)																																																																								
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">P.O</th> <th colspan="16">Week</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> </thead> <tbody> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>					P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																	PO-2																
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Short Course Description	Study of matrices to solve systems of linear equations, functions, function limits, function continuity, function derivatives and their applications, integrals and their applications																																																																							
References	Main :																																																																							
	1. Purcell, E. J. et al. 2010. Kalkulus Jilid I Edisi 8 (Terjemahan). Jakarta: Erlangga 2. Finney, R.L., Weir, M.D., Giordano F.R., 2001. Thomas' Calculus 10th Edition. USA: Addison-Wesley Publishing Company																																																																							
	Supporters:																																																																							

1. Adams, R. A. dan Essex, C. 2018. *Calculus: A Complete Course (9th Edition)*. Toronto: Pearson.
2. Hass, J., et al, 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. Janet Trineke Manoy, M.Pd.
 Dr. Endah Budi Rahaju, M.Pd.
 Nurus Saadah, S.Pd., M.Pd.
 Shofan Fiangga, S.Pd., M.Sc.
 Nina Rinda Prihartiwi, S.Pd., M.Pd.
 Dr. Yurizka Melia Sari, M.Pd.
 Dayat Hidayat, S.Pd., M.Pd., 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 matrix and its applications	Determining the inverse of a matrix	Criteria: Class discussion Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Matrix Literature: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	2%
2	Understand the matrix and its applications	Determine matrix solutions and their applications	Criteria: Class discussion Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Matrix Literature: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	3%
3	Understanding functions, origin areas, product areas, drawing function graphs	Activeness in discussions, presence, accuracy in answering questions	Criteria: Class discussion Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Library Function : <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	2%
4	Understanding function limits	Activeness in discussions, presence, accuracy in answering questions	Criteria: Class discussion Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Function Limits Literature: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	3%
5	Understand the derivatives of algebraic, trigonometric, exponential functions	Activeness in discussions, presence, accuracy in answering questions	Criteria: Class discussion Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Derivatives of algebraic functions, trigonometry, exponentials References: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	2%

6	Understand partial derivatives of algebraic functions	Activeness in discussions, presence, accuracy in answering questions	Criteria: Class discussion Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Reference Matrix : 1. Purcell, EJ and D. Verberg. 1996. <i>Analytical Calculus and Geometry I. English translation.</i> Susila B. Kartasasmita and Rawuh. Erlangga, Jakarta. Material: Partial derivatives of algebraic functions References: Purcell, EJ et al. 2010. <i>Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	3%
7	Solve problems related to derivatives	Activeness in discussions, presence, accuracy in answering questions	Criteria: Class discussions, assignments Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository), 2 x 50' assignments		Material: Derivative Applications Literature: Purcell, EJ et al. 2010. <i>Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	3%
8	Midterm Exam (UTS)	Accuracy in answering questions	Criteria: Writing test Form of Assessment : Test	Midterm Exam (UTS) 100'			20%
9			Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'			4%
10		1. Determine the anti-derivative 2. Solving integrals using substitution techniques	Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Anti-Derivatives and Integration Techniques Literature: Purcell, EJ et al. 2010. <i>Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	4%
11	Understand rational split integrals	Solving rational broken form integrals	Criteria: Class discussions, assignments Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Rational broken integrals References: Purcell, EJ et al. 2010. <i>Calculus Volume I Edition 8 (Translation).</i> Jakarta: Erlangga	4%

12	Understand partial integrals	Collaborative approach (discussion and expository)	Criteria: Class discussions, assignments Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: partial form integrals References: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation). Jakarta: Erlangga</i>	5%
13	Understand integrals of definite form	Calculating integrals of definite form	Criteria: Class discussions, assignments Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Definite form integrals References: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation). Jakarta: Erlangga</i>	5%
14	Understand the application of integrals (Area, Volume, Arc Length, Surface Area)	Calculate the area under the curve	Criteria: Class discussions, assignments Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Area under the curve References: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation). Jakarta: Erlangga</i>	5%
15	Understand the application of integrals (Area and Volume)	Collaborative approach (discussion and expository)	Criteria: Class discussions, assignments Form of Assessment : Participatory Activities	Collaborative approach (discussion and expository) 2 x 50'		Material: Volume of Rotating Objects References: <i>Purcell, EJ et al. 2010. Calculus Volume I Edition 8 (Translation). Jakarta: Erlangga</i>	5%
16	Final Semester Examination (UAS)	Accuracy in answering questions	Criteria: Writing test Form of Assessment : Test	Final Semester Examination (UAS)			30%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	50%
2.	Test	50%
		100%

Notes

- 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.
- 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 the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.