



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																																
Physical Chemistry IV: Colloids and Surfaces	8420403144		T=3	P=0	ECTS=4.77	6	July 18, 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																																						
	Program Objectives (PO)																																						
	PLO-PO Matrix																																						
		P.O																																					
Short Course Description	Study of surface properties, capillarity symptoms, surface thermodynamics, adsorption, surfactants, detergents, emulsions, bases and aerosols, chemisorption and catalysts																																						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 10%; text-align: center;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">4</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">7</td> <td style="width: 5%; text-align: center;">8</td> <td style="width: 5%; text-align: center;">9</td> <td style="width: 5%; text-align: center;">10</td> <td style="width: 5%; text-align: center;">11</td> <td style="width: 5%; text-align: center;">12</td> <td style="width: 5%; text-align: center;">13</td> <td style="width: 5%; text-align: center;">14</td> <td style="width: 5%; text-align: center;">15</td> <td style="width: 5%; text-align: center;">16</td> </tr> </table>							P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Supporting lecturer	SITI TJAHJANI Prof. Dr. Harun Nasrudin, M.S. Bertha Yonata, S.Pd., 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 fluid viscosity	<ol style="list-style-type: none"> 1.Explain the meaning and scope 2.Explain the various types of viscometers 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2))Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10 	Discussion 3 X 50			0%
2	Understand fluid viscosity	<ol style="list-style-type: none"> 1.Explain the viscosity coefficient 2.Explain the working principle of viscosity 3.Explain the various ways of measuring viscosity 4.Explain the factors that influence viscosity 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2))Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10 	Practice Questions, Presentations and Discussions 3 X 50			0%
3	Understanding the thermodynamic properties of surfaces for surface tension studies	Explain the properties of surfaces in liquid matter	<p>Criteria:</p> <ol style="list-style-type: none"> 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2))Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10 	Discussion 3 X 50			0%

4	Understanding the thermodynamic properties of surfaces for surface tension studies	Explain surface tension	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Practice questions, discussions and presentations 3 X 50			0%
5	Understanding the thermodynamic properties of surfaces for adsorption studies	Explain the properties of surfaces in solid materials	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Discussion 3 X 50			0%
6	Understanding the thermodynamic properties of surfaces for adsorption studies	Explain the properties of surfaces in solid materials	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Discussion 3 X 50			0%

7	Understanding the thermodynamic properties of surfaces for adsorption studies	Explain the properties of surfaces in solid materials	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Discussion 3 X 50			0%
8	UTS	1.Definition and scope 2.Various types of viscometers 3.Viscosity coefficient, 4.The working principle of a viscometer 5.Viscosity measurement 6.Factors that influence viscosity 7.Surface properties in surface tension study material	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	3 X 50			0%
9	Understanding the thermodynamic properties of surfaces for adsorption studies	Explain about adsorption on the surface of substances	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Discussion 3 X 50			0%

10	Understanding the thermodynamic properties of surfaces for adsorption studies	Explain about adsorption on the surface of substances	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Discussion 3 X 50			0%
11	Understand the colloid system and its use in everyday life	1.Explain the state of colloids in terms of particle size, type of colloid and its properties 2.Explain the kinetic properties of colloids	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Presentation and Discussion 3 X 50			0%
12	Understand the colloid system and its use in everyday life	Explain the optical properties of colloids	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Presentation and discussion 3 X 50			0%

13	Understand the colloid system and its use in everyday life	Explaining Colloidal Stability	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Presentation and Discussion 3 X 50			0%
14	Understand the colloid system and its use in everyday life	Mention the uses of colloids in everyday life	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	Presentation and discussion 3 X 50			0%
15	Understand the colloid system and its use in everyday life	Mention the uses of colloids in everyday life	Criteria: 1.The assessment is carried out on the following aspects: 2.Participation during lectures is carried out through observation (weight 2)UTS and UAS, carried out once by assessing all relevant indicators through written examinations, averaged and given a weight (2)Assignments are given a weight (3)The final NA is (participation value x2) (Assignment score x 3) (UTS score x 2) UAS score (3) divided by 10	presentation and discussion 3 X 50			0%
16	UAS	UAS	Criteria: Writing test	UAS 3 X 50			0%

No	Evaluation	Percentage
		0%

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.