



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

Document  
Code

**SEMESTER LEARNING PLAN**

<b>Courses</b>	<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>	<b>SEMESTER</b>	<b>Compilation Date</b>																																											
Analytical Chemistry II: Quantitative Analysis	4720103042		T=3 P=0 ECTS=4.77	3	July 18, 2024																																											
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>		<b>Study Program Coordinator</b>																																											
	.....		.....		Dr. Amaria, M.Si.																																											
<b>Learning model</b>	Project Based Learning																																															
<b>Program Learning Outcomes (PLO)</b>	PLO study program that is charged to the course																																															
	Program Objectives (PO)																																															
	PLO-PO Matrix																																															
		P.O																																														
	PO Matrix at the end of each learning stage (Sub-PO)																																															
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 5%;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> <td style="width: 5%;">11</td> <td style="width: 5%;">12</td> <td style="width: 5%;">13</td> <td style="width: 5%;">14</td> <td style="width: 5%;">15</td> <td style="width: 5%;">16</td> </tr> </table>														P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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<b>Short Course Description</b>	Study of the basic principles of quantitative analysis in terms of chemical structure, energetics and chemical analysis which includes the analysis process, evaluation of analysis results, chemical calculations, gravimetric and volumetric analysis (acid base titration, precipitation titration, complexing titration, redox titration), followed by laboratory activities supports so that students are able to master related concepts, are skilled in using tools, are able to collaborate and be responsible and can communicate their knowledge and skills scientifically.																																															
<b>References</b>	<b>Main :</b>																																															
	<ol style="list-style-type: none"> <li>1. Basset,J.,et.al.1991. Vogel:Texbook of Quantitative Inorganic AnalysisIncluding Elementary InstrumentalAnalysis. London: Longman Group</li> <li>2. Limited Day, Jr, R.A., dan Underwood, A.L., 2002.QuantitativeAnalysis. Sixth Ed. (Alih bahasa: Sopyan, I.). Jakarta: Penerbit Erlangga.</li> <li>3. Skoog, Douglas.A. 1982,Fundamental of Analytical Chemistry.Fourth Edition. Tokyo: Holt-Sounders Japan</li> </ol>																																															
	<b>Supporters:</b>																																															
<b>Supporting lecturer</b>	Prof. Dr. Hj. Sri Poedjiastoeti, M.Si. Prof. Dr. Pirim Setiarso, M.Si. Rusmini, S.Pd., M.Si. Prof. Dr. Nita Kusumawati, S.Si., M.Sc.																																															
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 basic skills that must be possessed in quantitative analysis and methods of volumetric analysis	Describe the basic skills that must be possessed in quantitative analysis and methods of volumetric analysis	<b>Criteria:</b> Student answers are included in the participation value	Lecture, question and answer, 3 X 50 demonstration			0%																																									

2	Understand the principles of volumetry in calculating the concentration of a substance in the analyte	Apply volumetric principles in calculating the concentration of a substance in the analyte	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, 3 X 50			0%
3	Understand the principles of gravimetry in calculating the levels of a substance in an analyte	Apply gravimetric principles in calculating the levels of a substance in the analyte	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, 3 X 50			0%
4	Understand the principles of neutralization titration in calculating the levels of a substance	Explain the principles of monoprotic neutralization titration	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, demonstrations 3 X 50			0%
5	Understand the principles of neutralization titration in calculating the levels of a substance	Explain the principles of diprotic neutralization titration	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions 3 X 50			0%
6	Understand the principles of neutralization titration in calculating the levels of a substance	Explain the principles of polyprotic neutralization titration	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, 3 X 50			0%
7	Understand the principles of neutralization titration in calculating the levels of a substance	Apply the principles of neutralization titration in calculating the levels of a substance in everyday life	<b>Criteria:</b> Prelab results, post lab, and assignment grades are entered	practical 6 X 50			0%
8	UTS	meeting indicators 1-7	<b>Criteria:</b> Student scores are included in UTS scores	2 X 50 test			0%
9	Understand the principles of precipitation titration (argentometry) in calculating the concentration of a substance	Explain the principles of precipitation titration (argentometry)	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, demonstrations 3 X 50			0%
10	Understand the principles of precipitation titration (argentometry) in calculating the concentration of a substance	Explain concentration calculations in precipitation titration (argentometry)	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions 3 X 50			0%
11	Understand the principles of complexing titration in calculating the concentration of a substance	Explain the principles of complexing titration	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, 3 X 50			0%
12	Understand the principles of precipitation titration (argentometry) and the principles of complexation titration in calculating the concentration of a substance	Applying the principles of precipitation titration (argentometry) and Applying the principles of complexing titration in calculating the levels of a substance in everyday life	<b>Criteria:</b> Prelab results, post lab, and assignment grades are entered	practicum 3 X 50			0%

13	Understand the principles of redox titration in calculating the levels of a substance	Explain the principles of redox titration: permanganometry	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, 3 X 50			0%
14	Understand the principles of redox titration in calculating the levels of a substance	Explain the principles of redox titration: iodo iodimetry	<b>Criteria:</b> Student answers are included in the participation value	Lectures, questions and answers, practice questions, discussions, 3 X 50			0%
15	Understand the principles of redox titration in calculating the levels of a substance	Apply the principles of redox titration in calculating the levels of a substance in everyday life	<b>Criteria:</b> Prelab results, post lab, and assignment grades are entered	practical 6 X 50			0%
16	UAS	meeting indicators 9-15	<b>Criteria:</b> entrance value of UAS components	2 X 50 test			0%

#### Evaluation Percentage Recap: Project Based Learning

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.**