



**SEMESTER LEARNING PLAN (RPS)**  
**UNDERGRADUATE CHEMISTRY STUDY PROGRAM**  
**FACULTY OF MATHEMATICS AND NATURAL SCIENCES**  
**UNIVERSITY OF BENGKULU**

Identity of Course		Identity of Lecturer	
Code	: KIM-202	Name	: Drs. Nesbah, MS
Course Name	: Analytical Chemistry I	Field	: Chemistry
Course Weight (credits)	: 4 (3-1) credits		
Semester	: 3 (three)		
Prerequisite Courses	: Basic Chemistry I and Basic Chemistry II		
Graduate Learning Outcomes (CPL )			
CPL Code		Elements of CPL	
S-9	:	Demonstrate a responsible attitude towards work in the field of expertise independently;	
KU-1	:	Able to apply logical, critical, systematic and innovative thinking in the context of developing or implementing science and technology that pays attention to and applies humanities values in accordance with their field of expertise.	
KU-2	:	Able to demonstrate independent, quality and measurable performance.	
KU-5	:	Able to make appropriate decisions in the context of solving problems in their area of expertise based on the results of information and data analysis.	
Scientific Study Materials	:	Analytical Chemistry	
CP Courses (CPMK)	:	Students can understand and perform qualitative analysis; cation-anion analysis. Quantitative analysis: gravimetric analysis, acid-base titration, redox titration, precipitation titration and complexometric titration.	
Learning Experience	:	Students are given knowledge of the concept of analysis, analytical processes, error analysis, analytical evaluation and chemical calculations. Qualitative analysis consisting of cation-anion analysis, separation of H <sub>2</sub> S and identification of cations and anions reactions as well as qualitative analysis of the instrument. Quantitative analysis include; gravimetric analysis, acid-base titration, redox titration, precipitation titration and complexometric titration.	
Reference List	:	1) Vogel, 1990. Ed. 5. Macro and Semi-micro Qualitative Inorganic Analysis Textbook. Jakarta 2) Skoog, DA, West, DM and Holler, FJ,. 1996, "Analytical Chemistry, an Introduction", 7 <sup>th</sup> edition, Saunder College. 3) Kennedy, JH. 1990, "Analytical Chemistry, Principles", 2 <sup>th</sup> edition, Harcourt. 4) Lagowski, JJ and Soruun, CH 1991, Introduction to Semimicro Qualitative Analysis, 7 <sup>th</sup> edition, Prentice Hall 5) Day Jr./ RA and Underwood, AL,. 1991 "Quantitative Analysis", 6 <sup>th</sup> edition , Prentice Hall International. 6) Khopkar SM, "Basic Concepts of Analytical Chemistry", wiley Eastern Limited	

Stage	Final Ability	Main Material	Reference	Learning Method	Time (minutes)	Assessment*	
						Indicator/ CPL code	Assessment technique /weight
1	2	3	4	5		6	7
1	<ul style="list-style-type: none"> <li>Applying lecture rules and assessment components subject</li> </ul>	<ul style="list-style-type: none"> <li>Lecture Contract</li> <li>Lecture regulations</li> <li>Assessment components</li> <li>Reference/literature/reference book</li> </ul>	Ref No: -	Lecture discussion	3x50	Knowing assessment and reference components	
2	<ul style="list-style-type: none"> <li>Students can understand and explain the meaning of analytical chemistry and the application of analytical chemistry in the field of science</li> </ul>	<ul style="list-style-type: none"> <li>Understanding qualitative and quantitative analytical chemistry</li> <li>Applications of analytical chemistry in the field of science</li> </ul>	Ref No: 1,4,5,6	Lectures Class discussion Tasks	3x50	Understand the meaning of analytical chemistry and the application of analytical chemistry in the field of science	Test/7%
3	<ul style="list-style-type: none"> <li>Students can understand and explain the concept of analysis: analysis process, analysis error and evaluation analysis Analysis</li> </ul>	<ul style="list-style-type: none"> <li>concept : analysis process, error analysis and analysis evaluation</li> </ul>	Ref No : 2,3,5,6	Lecture Class discussion Task	3x50	Understand analysis concept : analysis process, error analysis and analysis evaluation	Test/7%
4	<ul style="list-style-type: none"> <li>Students can understand and explain the basic principles of qualitative analysis of cations using the H<sub>2</sub>S method and anion qualitative analysis</li> </ul>	<ul style="list-style-type: none"> <li>Qualitative analysis of H<sub>2</sub>S method and anion qualitative analysis</li> </ul>	Ref No: 1.4	Lecture Class discussion Group discussion Tasks	3x50	Understand the basic principles of qualitative analysis of H <sub>2</sub> S method and anion qualitative analysis	Test/7%
5	<ul style="list-style-type: none"> <li>Lecture evaluation of first, second, third and fourth meeting</li> </ul>	<ul style="list-style-type: none"> <li>Exams Module I</li> </ul>		Written exam	3x50		Test/4%
6	<ul style="list-style-type: none"> <li>Students can understand and explain the classification of volumetric analysis</li> <li>Students can understand and explain the stages of volumetric analysis:               <ol style="list-style-type: none"> <li>Sampling</li> <li>Sample preparation</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>Volumetric analysis classification</li> <li>Stages of volumetric analysis:               <ul style="list-style-type: none"> <li>Sampling</li> <li>Sample preparation</li> </ul> </li> </ul>	Ref No: 3, 5,6	Lecture Class discussion Group discussion Task	3x50	Understand the classification of volumetric analysis and stages of volumetric analysis: <ol style="list-style-type: none"> <li>Sampling</li> <li>Sample preparation</li> </ol>	Test/7%

7	Students can understand and explain the advanced stages of volumetric analysis: 3. Preparation of primary standard solution. 4. Standardization of secondary standard solutions 5. Measurement concentration of sample solution 6. and calculation of concentration	<ul style="list-style-type: none"> <li>● Preparation of Primary standard solution</li> <li>● Standardization of secondary standard solution</li> <li>● Measurement of sample solution concentration</li> <li>● and calculation of Concentration</li> </ul>	Ref No: 3,5,6	Lecture Class discussion Group discussion Task	3x50	Understanding the advanced stages of volumetric analysis: 3. Preparation of primary standard solution 4. Standardization of secondary standard solution 5. Measurement of calculated sample solution 6. concentration	Test
8	<ul style="list-style-type: none"> <li>● Students can understand and explain the meaning of gravimetric analysis</li> <li>● Students can explain the classification of gravimetric analysis</li> <li>● Students can understand and explain the stages of gravimetric analysis: Sampling, Sample preparation, Weight measurement and Calculation of levels/concentration</li> </ul>	<ul style="list-style-type: none"> <li>● Gravimetric analysis</li> <li>● Classification of gravimetric analysis</li> <li>● Stages of gravimetric analysis: Sampling, sample preparation, weight measurement and calculation of levels/concentrations</li> </ul>	Ref No: 3,5,6	Lecture Class discussion Group discussion Task	3x50	Understand the meaning and classification of gravimetric analysis Understand the stages of gravimetric analysis i : Sampling, Sample preparation, Weight measurement and Calculation of levels/concentration	Test/7%
9	● Evaluation of the sixth, seventh and eighth lectures	● Module II		Exam Written exam	3x50		Test/4%
10	● Students can understand and explain acid-base titrations, draw titration curves and application of acid-base	<ul style="list-style-type: none"> <li>● titrations Acid-base titrations</li> <li>● Acid-base titration curves</li> <li>● Applications of acid-base titrations</li> <li>● Discussion of questions</li> </ul>	Ref No: 3,5,6	Lectures Class discussion Group discussion Tasks	3x50	Understanding acid-base titrations, drawing titration curves and knowing the application of acid-base titrations	Test/7%
11	● Students can understand and explain the selection of indicators, types of indicators and errors of acid-base titration indicators bases	<ul style="list-style-type: none"> <li>● Selection of acid-base indicators</li> <li>● Types of acid-base indicators</li> <li>● Errors of acid-base titration indicators</li> </ul>	Ref No: 3,5,6	Lectures Class discussion Group discussions Tasks	3x50	Understand the selection of indicators, types of indicators and indicator errors in acid-base titrations	Test/7%
12	● Students can understand and explain redox titrations, draw redox titration curves and the application of redox titrations.	<ul style="list-style-type: none"> <li>● Redox titrations</li> <li>● Draw redox titration curves.</li> <li>● Redox titration applications.</li> <li>● Discussion of questions</li> </ul>	Ref No: 3,5,6	Lecture Class discussion Group discussion Task	3x50	Understanding redox titration, drawing redox titration curve and knowing the application of redox titration	Test/7%

13	<ul style="list-style-type: none"> <li>Evaluation of the tenth, eleventh and twelfth lectures</li> </ul>	<ul style="list-style-type: none"> <li>Module III</li> </ul>		Exam Written exam	3x50		Test/4%
14	<ul style="list-style-type: none"> <li>Students be able to understand and explain precipitation titrations, draw precipitation titration curves and application of precipitation titrations</li> </ul>	<ul style="list-style-type: none"> <li>Precipitation titrations</li> <li>Draw precipitation titration curves</li> <li>Applications of precipitation titrations</li> <li>Discussion of questions</li> </ul>	Ref No: 3,5,6	Lectures Class discussion Group discussions Tasks	3x50	Understand precipitation titrations, draw precipitation titration curves and knowing the application of precipitation titrations	Test/7%
15	<ul style="list-style-type: none"> <li>Students can understand and explain the indicators of precipitation titrations involving silver: the Mohr method, the Vohard method, and the Fajans method</li> </ul>	<ul style="list-style-type: none"> <li>Precipitation titration indicators involving silver: the Mohr method, the Vohard method, and the Fajans method</li> </ul>	Ref No : 3,5,6	Lecture Class discussion Group discussion Task	3x50	Understanding the indicator of titration deposits involving silver: Mohr's method, Vohard's method, and Fajans' method	Tes/7%
16	<ul style="list-style-type: none"> <li>Students can understand and explain complexometric titrations, draw complexometric titration curves, complexometric titration applications, complexometric titrations, draw complexometric titration curves,</li> </ul>	<ul style="list-style-type: none"> <li>Complexometric titration</li> <li>To draw complexometric titration curve</li> <li>Applications of complexometric titration</li> <li>Discussion of questions</li> </ul>	Ref No : 3,5,6	Lectures Class discussion Group discussion assignments	3x50	Understand complexometric titrations, draw complexometric titration curves and know the application of complexometric titrations	Test/7%
17	<ul style="list-style-type: none"> <li>Evaluation of the fourteenth, fifteenth and sixteenth lectures</li> </ul>	<ul style="list-style-type: none"> <li>Module IV</li> </ul>		Exam Written exam	3x50		Tests/4%

FINAL VALUE = 15% UM I + 15% UM II + 15% UM III + 15% UM IV + 15% TASK + 25% Practicum Value

## Appendix 1. Learning Outcomes of Graduates

According to Permenristekdikti Attachment No. 44 of 2015 concerning the National Standards for Higher Education

### A. The formulation

Attitudes that must be possessed by every graduate of academic, vocational and professional education programs are as follows,

CPL Code	Formulation
S-1	Believe in God and be able to demonstrate a religious attitude
S-2.	Upholding humanity values in carrying out tasks based on religion, morals, and ethics
S-3	Contributes on improving the quality of life in society, nation, state, and progress of civilization based on Pancasila
S-4	Take a role as a citizen who proud and love the nation, has nationalism and responsibility to the state and nation
S-5	Respects cultural diversity, views, religion, and beliefs, as well as other people's original opinions or findings
S-6	works together and has social sensitivity and concern for society and the environment

S-7	obeys the law and is disciplined in life society and the state
S-8	internalizes academic values, norms, and academic ethics
S-9	demonstrates a responsible attitude towards work in their field of expertise independently;
S-10	internalizes the spirit of independence, struggle, and entrepreneurship

## B. General Skills Formula

### B1. Undergraduate Program

CPL Code	General Skills Formula
KU-1	Able to apply logical, critical, systematic and innovative thinking in the context of developing or implementing science and technology that pays attention to and applies humanities values in accordance with their field of expertise.
KU-2	Able to demonstrate independent, quality and measurable performance.
KU-3	Able to study the implications of the development or implementation of science and technology that pays attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticism, compose a scientific description of the results of the study in the form of a thesis or final project report, and upload it on the college website.
KU-4	Compile a scientific description of the results of the studies mentioned above in the form of a thesis or final project report and upload it on the university's website.
KU-5	Able to make appropriate decisions in the context of solving problems in their field of expertise based on the results of information and data analysis.
KU-6	Able to maintain and develop a network with supervisors, colleagues, collaborators both inside and outside the institution.
KU-7	Able to be responsible for the achievement of group work results and supervise and evaluate the completion of work assigned to workers under their responsibility.
KU-8	Able to carry out the evaluation process of work groups under their responsibility and able to manage learning independently
KU-9	Able to document, store, secure and rediscover data to ensure validity and prevent plagiarism.

### B2. Diploma Three Program

CPL Code	General Skills Formula
KU-1	Able to complete wide-ranging work and analyze data with various appropriate methods, both those that have not been or have been standardized
KU-2	Able to demonstrate quality and measurable performance
KU-3	Able to solve work problems with the nature and characteristics of context that is in accordance with the field of applied expertise based on logical thinking, innovative, and responsible for the results independently
KU-4	Able to compile reports on results and work processes accurately and accurately and communicate them effectively to other parties who need
KU-5	Able to work together, communicate and be innovative in their work
KU-6	Able to be responsible for the achievement of group work results and supervise and evaluate the completion of work assigned to workers under their responsibility
KU-7	Able to carry out a self-evaluation process for work groups under their responsibility and able to grow work competency development independently
KU-8	Able to document, store, secure and retrieve data to ensure validity and prevent plagiarism