SEMESTER LEARNING PLAN
PROGRAM STUDI S-1KIMIA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS BENGKULU

Subject Identity			**Lecture Identity**		
Code	:	KIM-652	Lecture	:	Drs. Nesbah, M.S. Ria Nurwidiyani S.Pd., M.Sc.
Subject	:	Kimia Analisis Terapan	Field Group	:	Analytical Chemistry
Course Weight (sks)	:	2 (2-0) sks			
Semester	:	6 (six)			
Prerequisite Course	:	-			

Learning Outcome (LO)

Code		**LO Element**
S-9	:	Demonstrate a responsible attitude towards work in their area 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.
Scientific Study Materials	:	The concept of making solutions, units of solution concentration, standardization of analytical instrumentation, standardization of standard solutions, basic concepts of spectrophotometry, and the concept of various types of titrations.
Course Learning Outcome (CLO)	:	1. Students can explain the basic concept of making a solution by understanding several concentration units. 2. Students can change the concentration unit into another unit. 3. Students can calculate the mass and volume used to make a solution 4. Students can explain how to standardize tools and materials used in an analysis. 5. Students can explain the principles of analysis using several methods (acid-base titration, redox titration, gravimetric, spectrophotometry, Kjedahl method, etc.) 6. Students can explain the principle of using several simple analytical tools (pH meter, spectrophotometer, TDS, refractometer, blood sugar test kit) 7. Students can apply the basic principles of chemical analysis to determine the levels of various samples.
Learning Experience	:	Students are given initial knowledge about basic concepts in the manufacture of solutions as well as standardization of tools and materials used in sample analysis for further application to measure the levels of various types of samples.
Daftar Referensi	:	1. R.A.Day, Jr & A.L. Underwood. 1999. Analisis Kimia Kuantitatif Edisi Keenam. Jakarta : Erlangga. 2. VOGEL, Kimia Analisis Kuantitatif Anorganik

Step	Final Ability	Subject matter	Reference	Learning Method	Time (minutes)	Evaluation*	
						Indicator	Evaluation Technique
1	2	3	4	5		6	7
1	Applying lecture rules and course assessment components	Introduction: (1) Learning method, (2) Learning process agreement, (3) Assesment component, 4) Learning resources/literature used	Ref No : -	Guided Disscussion	2x50	Knowing the components of the assessment and references to be used	
2	Understand the concept of standardization of tools and materials and the use of simple analytical tools	Concepts and principles of standardization of measuring instruments and substances: Standardization of pH meters and standardization of substances in titration	Ref No : 1,2	Guided Disscussion	2x50	• Students can standardize the pH meter • Students can standardize secondary standard solutions	• Student activity • Student project • Personal task
3	Understand the Principles of spectrophotometry	The basic concept of Spectrophotometric measurements: Stages of spectrophotometric analysis and interpretation of the results of the analysis	Ref No : 1,2	Guided Disscussion	2x50	• Students can make a series of standard solutions • Students can interpret measurement data	• Student activity • Student project • Personal task
4	Understand the application of titration in determining the concentration of substances in samples	Application of acid-base titration to determine the levels of formalin and borax in food samples	Ref No : 1,2	Presentation ClassDiscussion	2x50	• Students can explain the principles of acid-base titration, redox, and precipitation titration • Students can apply the titration method to determine sample concentration	• Student activity • Student project • Personal task

5	Understand the use of a pH meter in measuring the degree of acidity of a sample	Application pH meter to determine the pH of coffee, oil, soil, and cosmetics	Ref No : 1,2	Presentation ClassDiscussion	2x50	• Students can explain how to measure the acidity of a sample with a pH meter • Students can standardize the pH meter	• Student activity • Student project • Personal task
6	Determination of free fatty acids using the acid-base titration method	Application of acid base titration to determine free fatty acid (ALB) and ester number in oil.		Presentation ClassDiscussion	2x50	• Students can determine the level of free fatty acids using acid-base titration • Students can determine the number of esters in cooking oi	• Student activity • Student project • Personal task
7	Determine the peroxide number and iodine number in cooking oil	Application of redox titration to determine peroxide number and iodine number in oil	Ref No : 1,2	Presentation ClassDiscussion	2x50	• Students can determine the number of peroxides in cooking oil • Students can determine the number of iodine in cooking oil	• Student activity • Student project • Personal task
8	Mid term				2x50		Sumatif Test/ 15%
9	Determining the levels of enzymes and amino acids by spectrophotometric method	Determining the levels of enzymes and amino acids by spectrophotometric method	Ref No : 1,2	Presentation ClassDiscussion	2x50	• Students can explain the principle of a spectrophotometer • Students can explain how to make standard solutions • Students can determine the concentration of enzymes and amino acids	• Student activity • Student project • Personal task

10	Determining the levels of formalin and borax by spectrophotometric method	Spectrophotometry application to determine the levels of formalin and borax in food samples.	Ref No : 1,2	Presentation ClassDiscussion	2x50	• Students can explain how to prepare samples • Students can explain how to make a standard solution series • Students can explain how to measure the absorbance of samples • Students can determine the levels of formalin and borax in the sample	• Student activity • Student project • Personal task
11	Understand the soxhletation method and Kjeldahl method	Determining fat content by soxhletation method and determining protein by Kjeldahl method		Presentation ClassDiscussion	2x50	• Students can explain the steps in the soxhletation method • Students can explain the principles of Kjeldahl analysis	• Student activity • Student project • Personal task
12	Understand distillation and gravimetric methods	Determining the moisture content of the oil by the distillation method and the moisture content of the grain by the gravimetric method.	Ref No : 1,2,3	Presentation ClassDiscussion	2x50	• Students can explain the principle of distillation • Students can explain the principle of gravimetric • Students can apply distillation and gravimetric methods to determine water content in samples	• Student activity • Student project • Personal task
13	Understand the application of gravimetric and refractometry	Determination of crude fiber content by gravimetric method and total carbohydrate by refractometric method	Ref No : 1,2,3	Presentation ClassDiscussion	2x50	• Students can explain the principles of gravimetric and refractometry • Students can calculate fiber content using the gravimetric method • Students can determine total carbohydrates using the refractometric method	• Student activity • Student project • Personal task

14	Understand how to determine glucose and vitamin C levels	Determining glucose and vitamin C by spectrophotometric method	Ref No : 1,2,3	Presentation ClassDiscussion	2x50	• Students can explain the principle of a spectrophotom eter • Students can explain how to make standard solutions • Students can determine the concentration of glucose and vitamin C	• Student activity • Student project • Personal task
15	Understand the application of precipitation titration	Determine cyanide by precipitation titration method and Sulphate by acid base titration method	Ref No : 1,2,3	Presentation ClassDiscussion	2x50	• Students can explain the principle of precipitation titration • Students can determine cyanide levels by precipitation titration	• Student activity • Student project • Personal task
16	Final Exam				2x50		Sumatif Test / 20%

Project Base Learning :

Step 4-15 : Students searching for references related to the application of acid-base titration methods, redox titration, refractometry, gravimetric, spectrophotometry, Kjeldahl methods, and distillation in determining the concentration of substances in samples. Then the students made a procedure for determining the level of substances using this method in the form of a power point. Students present assignments that have been made to be discussed together in class.

EvaluationPercentage :

Percentage (%)	Description
25	Student activity in class
25	Student project
10	Independent and Group Tasks
20	Mid-term
20	Final exam

Student activity evaluation :

Evaluation Aspect	Score			
	1	2	3	4
Ability to ask questions in presentation sessions				

Depth of questions in the presentation session				
Ability to answer questions from the audience				
Ability to express opinions during presentations				

Student project evaluation

Evaluation Aspect	**Score**			
	1	**2**	**3**	**4**
Conformity of title with related journal				
Compliance with work procedures				
Depth of analysis				
The accuracy of using formulas and calculations				

Personal Task Evaluation

Evaluation Aspect	**Score**			
	1	**2**	**3**	**4**
Powerpoint display				
Use of the animation player app				
Composition of sentences and images in view				
The suitability of the title with the content of the presentation				