SEMESTER LEARNING PLAN (SLP)
MASTER STUDY PROGRAM OF CHEMISRTY
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
BENGKULU UNIVERSITY

Course Identity			**Identity of the Course Lecturer**		
Course Code	:	**MIK-222**	Lecturer Name	:	Dr. Eka Angasa, M.Si/ Dr. Eng. Asdim, M.Si
Course Name	:	Elucidation of the Structure of Inorganic Materials	Field Group	:	Inorganic Chemistry
Credit Unit (sks)	:	2 (2-0)			
Semester	:	2			
Prerequisite Course	:	-			

Program Learning Outcome (PLO)

PLO Code		**PLO Elements**
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-3	:	Able to compile ideas, thoughts, and scientific arguments responsibly and based on academic ethics, and communicate them through the media to the academic community or the wider community
KU-5	:	Able to identify scientific fields in solving science and technology development problems that apply humanities values based on analytical or experimental studies on information and data;
Scientific Study Materials	:	1. Structural and technical characterization of solids 2. X-Ray Diffraction 3. XRF 4. Microscopy technique: SEM and TEM 5. UV-Vis Spectroscopy 6. IR and Raman Spectroscopy 7. Thermal Analysis: TGA and DTA 8. Gas Sorption Gas
Course Learning Outcomes (CLO)	:	1. Master in explaining the techniques of characterization of inorganic materials. 2. Master in XRD and XRF analysis techniques and able to interpret the analysis results 3. Master in microscopic analysis techniques and interpreting analytical data 4. Master in UV-Vis, IR, and Raman spectroscopy techniques and interpreting analytical data. 5. Master in thermal analysis techniques and interpreting analytical data 6. Master in gas absorption analysis techniques and interpreting analytical data
Learning Experience	:	Students are given knowledge about inorganic compound analysis techniques and interpret analytical data and describe analytical data in research reports and scientific articles.
References	:	1. Nigel J.K. Simpson, 2000, Solid-Phase Extraction: Principles, Techniques, and Applications, CRC Press 2. Setiabudi, A., R. Hardian, A. Muzakir. 2012. Karakterisasi Material: Prinsip dan Aplikasinya dalam Penelitian Kimia. UPI Press 3. Abdullah, M., Khairurrijal. 2009. Karakterisasi Nanomaterial: Teori, Penerapan, dan Pengolahan Data. CV. Rezeki Putera Bandung

Step	**Target Competency**	**Subject Matter**	**Reference**	**Learning Method**	**Time (min)**	**Evaluation***	
						Indicator	**Technique**
1	**2**	**3**	4	**5**		**6**	**7**
1	Applying lecture rules and course assessment component	1. Lecture contract 2. Learning rules 3. Assessment component 4. References	Ref No : -	Group discussion	2x50	Knowing the assessment components and references	Student activity

2	Explain the structure of inorganic compounds and techniques for characterization of inorganic compounds	Structural and technical characterization of solids	Ref No : 1,2,3	Group discussion		students can understand the structure of solids and solids characterization techniques	Presentation
3	Explain the basic concepts of X-ray analysis	X-Ray	Ref No : 1,2,3	Group discussion	2x50	Understand the basic concepts of X-ray formation and its applications	Presentation
4-6	Explain the basic concepts of XRD analysis and describe the data	XRD: Principle, diffraction, and Bragg's law	Ref No : 1,2,3	Project Based Learning	6x50	Can define basic XRD concepts, applications, and determination of crystal structure	Paper about data analysis of XRD data
7	Explain the basic concepts of XRF analysis and describe the data.	XRF: principle, instrumentation, application, determination of elemental concentration	Ref No : 1,2,3	Group discussion	2x50	Can define basic XRF concepts, applications, and determination of elemental concentrations	Presentation
8	Mid-semester evaluation	Mid term			2x50		essay
9-10	Explaining microscopy techniques, processing data, and describing the data	Microscopy techniques: interaction of electrons with matter, principles, instrumentation, and applications of SEM and TEM	Ref No : 1,2,3	Project Based Learning	2x50	Can define SEM and TEM principles and describe SEM and TEM data	Paper about data analysis of SEM and TEM data
11	Explain the basic concepts of UV-Vis spectroscopic analysis and describe the analysis data.	UV-Vis Spectroscopy: principle, instrumentation and application	Ref No : 1,2,3	Group discussion Task	2x50	Able to define UV-Vis principles and present analytical data	Presentation
12-13	Explain the basic concepts of IR and Raman spectroscopic analysis and describe the analysis data	IR and Raman Spectroscopy: principle, instrumentation and application	Ref No : 1,2,3	Project Based Learning	4x50	Able to define the principles of IR and Raman spectroscopy and present analytical data	Paper about data analysis of IR and Raman data
14	Explain the basic concepts of thermal analysis and describe the analysis data.	TGA/DTA: Thermal analysis techniques and applications	Ref No : 1,2,3	Group discussion Task	4x50	Able to define TGA and DTA principles, applications, and describe data.	Presentation
15	Explain the principle of gas absorption analysis (GSA) and describe the analysis data.	Gas Absorption Analysis: Principle, preparation, process and application	Ref No : 1,2,3	Group discussion	2x50	Able to define GSA principles, functions, and describe data	Presentation
16	End of Semester Evaluation	Final exams			2x50		Assay