



SEMESTER LEARNING PLAN

CHEMISTRY STUDY PROGRAM S-1

FACULTY OF MATH AND SCIENCE

BENGKULU UNIVERSITY

Course Identity

Identity of course tutor

Course Code	:	KIM-907	Lecturer Name	:	Prof. Dr. Irfan Gustian, S.Si, M.Si
Course Name	:	Polymer Chemistry	Field Group	:	Physical Chemistry
Course Weight (credits)	:	2 (2-0)			
Semester	:	Choice			
Prerequisite Course	:	Thermodynamics and equilibrium, Phase and solution equilibrium			

Program Learning Outcomes (PLO)

PLO Code		PLO 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	:	
LO Course	:	This course is an elective course in the FMIPA chemistry study program which discusses the concepts of macromolecules, relative molecular mass of polymer (M), benefits of determining M, properties of M, Concept of M and method of determination of M, Polymerization Condensation, Addition Polymerization, Copolymerization, types of copolymerization, Solution Thermodynamics and composition diagram, polymer characterization.
Learning Experience	:	After attending this course, students are expected to be able to show the relationship between the concepts of macromolecules, mass relative molecule of polymer (M), benefits of determining M, properties of M, Concept of M and method of determination of M, Condensation Polymerization, Polymerization Addition, Copolymerization, types of copolymerization, Solution thermodynamics and composition diagrams, polymer characterization.
Reference list	:	<ol style="list-style-type: none"> 1. Billmeyer, Text Book of Polymer Science 2. Walton. D, Philip, L., 2000 "Polymers" Oxford Science Pub. New York 3. Cowd., MA, Firman, Hari (translator), 1991, Polymer Chemistry, Publisher ITB Bandung 4. Recent journals related to polymers. 5. Recent polymer research reports.

SEMESTER LEARNING PLAN

Course: POLYMER CHEMISTRY

Course code: KIM-907

Credit: 2 (2-0)

WEEK	EXPECTED FINAL ABILITY	STUDY MATERIALS (teaching materials)	FORMS OF LEARNING	ASSESSMENT CRITERIA (indicator)	ASSESSMENT
1-2	<ul style="list-style-type: none"> Students can understand explaining the concept of polymer basis, Definition, Classification, Use, Polymer, polymer chain structure, pendant group orientation, and polymer crystallinity 	<ul style="list-style-type: none"> Basic concepts of polymer science, polymer chain structure, pendant group orientation, polymer crystallinity 	<ul style="list-style-type: none"> Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> Completeness and correctness of explanation Sharpness and completeness of analysis 	5%
3-4	<ul style="list-style-type: none"> Students can recognize the various benefits of determining the relative molecular mass of M polymers, properties of M polymers, M polymer concepts, M determination methods. 	<ul style="list-style-type: none"> Various techniques in determining the relative mass of polymers. 	<ul style="list-style-type: none"> Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> Completeness and correctness of explanation Sharpness and completeness of analysis 	5%
5-6	<ul style="list-style-type: none"> Students can understand and explain the types of polycondensation reactions, chain structure, distribution of relative molecular mass. 	<ul style="list-style-type: none"> The basic concept of a polycondensation reaction 	<ul style="list-style-type: none"> Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> Completeness and correctness of explanation Sharpness and completeness of analysis 	5%
7	<ul style="list-style-type: none"> Students understand kinetic systems, polycondensation reaction rate, polymer & growth degree 	<ul style="list-style-type: none"> Polycondensation reaction kinetics 	<ul style="list-style-type: none"> Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> Completeness and correctness of explanation 	5%

	Polycondensation with catalyst			<ul style="list-style-type: none"> • Sharpness and completeness of analysis 	
8	<ul style="list-style-type: none"> • Understanding the principle of addition reactions, types of poly addition reactions Poly addition reactions. 	<ul style="list-style-type: none"> • Principle of addition reaction, Type of reaction poly addition Poly radical addition. 	<ul style="list-style-type: none"> • Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> • Completeness and correctness of explanation • Sharpness and completeness of analysis 	5%
		Mid-semester Exam			20%
9	<ul style="list-style-type: none"> • Understanding poly addition reactions ionic, Cationic polymerization kinetics, Anionic polymerization kinetics 	<ul style="list-style-type: none"> • Poly ionic addition, Cationic polymerization kinetics, Anionic polymerization kinetics 	<ul style="list-style-type: none"> • Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> • Completeness and correctness of explanation • Sharpness and completeness of analysis 	5%
10	<ul style="list-style-type: none"> • Explain radical polymerization kinetics, coordination polymerization kinetics 	<ul style="list-style-type: none"> • Radical polymerization kinetics, Coordination polymerization kinetics 	<ul style="list-style-type: none"> • Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> • Completeness and correctness of explanation • Sharpness and completeness of analysis 	5%
11-12	<ul style="list-style-type: none"> • Understand and be able to explain the reaction mechanism of Condensation Polymerization, Addition, Zeigler-Nata polymerization 	<ul style="list-style-type: none"> • Polymerization reaction mechanism Condensation, Addition, Zeigler-Nata . polymerization 	<ul style="list-style-type: none"> • Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> • Completeness and correctness of explanation • Sharpness and completeness of analysis 	5%

13	<ul style="list-style-type: none"> Understand and explain block copolymers, graft copolymers, alternating copolymers, composition diagrams 	<ul style="list-style-type: none"> block copolymers, graft copolymers, alternating copolymer, Composition diagram 	<ul style="list-style-type: none"> Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> Completeness and correctness of explanation Sharpness and completeness of analysis 	5%
14	<ul style="list-style-type: none"> Explain Grafting Copolymer Onto, Grafting From, Macronanomers, extrude, Gas blowing, sheet/film 	<ul style="list-style-type: none"> Grafting Onto, Grafting From, Macronanomers, extrude, Gas blowing, sheet/film 	<ul style="list-style-type: none"> Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> Completeness and correctness of explanation Sharpness and completeness of analysis 	5%
15-16	<ul style="list-style-type: none"> Students understand the principles Extrude Molding Techniques, modern polymers, polymer technology developments, and polymer characterization techniques: FTIR, TGA, DSC, XRD and polymer mechanical properties 	<p>principles of Extrude Molding Techniques, current polymers, polymer technology developments, and polymer characterization techniques: FTIR, TGA, DSC, XRD and polymer mechanical properties</p>	<ul style="list-style-type: none"> Contextual Learning (CL), Literature search, Small Group Discussion (SGD), Discovery Learning Assignment of materials related to meetings 	<ul style="list-style-type: none"> Completeness and correctness of explanation Sharpness and completeness of analysis 	5%
		Final Semester Exam			25%

Reference list

1. Billmeyer, Text Book of Polymer Science
2. Walton. D, Philip, L., 2000 "Polymers" Oxford Science Pub. New York
3. Cowd., MA, Firman, Hari (translator), 1991, Polymer Chemistry, Publisher ITB Bandung
4. Recent journals related to polymers.
5. Recent polymer research reports.

Bengkulu, August 8, 2022

lecturer

Prof. Dr. Irfan Gustian, S.Si, M.Si

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