


COURSE SPECIFICATION SAMPLE

		<b>YOGYAKARTA STATE UNIVERSITY</b> <b>FACULTY OF MATHEMATICS AND NATURAL SCIENCES</b> <b>CHEMISTRY EDUCATION DEPARTMENT / CHEMISTRY EDUCATION STUDY PROGRAM</b>			
<b>SEMESTER LESSON PLAN</b>					
<b>COURSE</b>	<b>CODE</b>	<b>COURSE CLUSTER</b>	<b>WEIGHT (CREDITS)</b>	<b>SEMESTER</b>	<b>DATE OF COMPLETION</b>
Chemistry Laboratory Management	KIP 6205	Analysis Chemistry	2	4	
<b>AUTHORIZATION</b>		<b>Lesson Plan Developer</b>	<b>MPK Coordinator</b>		<b>HEAD OF STUDY PROGRAM</b>
		Dra. Regina Tutik P., M.Si	Sunarto, M. Si.		Sukisman Purtadi, M.Pd.
<b>Learning Outcomes (LO)</b>	<b>LO-Study Program</b>				
	LO-1	The graduates of Chemistry Education Study Program can demonstrate the spirit of religiousness, moral, ethics, and Indonesian character in life within the society, the state, and the country			
	S	A.8. embodying academic values, norms, and ethics;			
		A.9. demonstrating accountability on the job of respective expertise independently; and			
		A.10. having the sincerity, commitment, determination to develop the students' attitudes, values, and abilities based on the values of local wisdom, as well as having the motivation to act for the benefit of the students and society in general			
	LO-3	The graduates of Chemistry Education Study Program can apply the concepts, principles, laws, and theories of Chemistry, as well as the science, education and Chemistry education that are continuously improving as a part of lifelong learning			
P	C.1. mastering theoretical concepts on chemical structure, dynamics, and energy, as well as the basic principles of separation, analysis, synthesis, and characterization				
	C.2. applying chemistry knowledge in various cases				
LO-4	The graduates of Chemistry Education Study Program can adapt scientific work skills and learning that are continuously improving in lifelong learning to solve problems related to chemistry and chemistry education				

	KU	D.1. being able to apply logical, critical, systematic, and innovative thinking in the context of science and technology development or implementation that pays attention to and apply humanities values that are in line with the respective expertise;
		D.2. being able to study the implications of the science and technology development or implementation that pays attention to and apply humanities values that are in line with the respective expertise based on the scientific principles, procedure, and ethics in order to generate solutions, ideas, designs, or art criticisms;
		D.4. being able to make decisions accurately in the context of solving problems in the respective field based on the result of analysis of information and data;
		D.5. being able to document, save, secure, and rediscover data to ensure validity and prevent plagiarism.
	LO-5	The graduates of Chemistry Education Study Program can adapt critical and creative thinking in solving problems related to personal and professional life
		E.1. being able to demonstrate independent, quality, and measured work performance;
		E.2. being able to maintain and develop good professional network with the supervisor, colleagues, and peers both inside and outside the institution;
		E.3. taking responsibility for the achievement of group work and supervising as well as evaluating the completion of work assigned to workers under their authority;
		E.4. carrying out a process of self-evaluation of work groups under their authority, and being able to manage the class independently
	KK	-
<b>CP – MK</b>		
M1	Students are able to work safely in the laboratory (A8, A9, A10, D1, D2, E1, E2, E3, E4) Students are able to administer correct performance assessments in laboratories (A8, A9, A10, C2, E1)	
M2	Students are able to master theories regarding (1) definitions, objectives, and scopes of laboratory management, (2) laboratory definitions and functions, (3) laboratory design and layout, (4) equipment management, (5) material management, (6) criteria for selecting equipment, (7) work safety in laboratories, (8) conducting learning assessment in laboratories, (9) laboratory waste management, (10) hazardous experimental techniques, and (11) MSDS (C1, C2, D1, D2, D3, D4, D5)	
M3	Students are able to manage laboratory equipment and materials well, calibrate and use laboratory equipment, and are skilled at preparing solutions and reagents (C1, C2, E1, E2, E3, E4)	
<b>Course Description</b>	This course discusses (1) definitions, objectives, and scopes of laboratory management, (2) laboratory definitions and functions, (3) laboratory design and layout, (4) equipment management, (5) material management, (6) criteria for selecting equipment, (7) work safety in laboratories, (8) conducting learning assessment in laboratories, (9) laboratory waste management, (10) hazardous experimental techniques, and (11) MSDS	
<b>Learning Material/Topic</b>	<ol style="list-style-type: none"> <li>1. Definitions, objectives, scopes of laboratory management, learning process, lecture contract, and laboratory rule of conduct</li> <li>2. Laboratory definitions and functions</li> <li>3. Laboratory design and layout</li> </ol>	

	4. Types and functions of equipment 5. Equipment management 6. Criteria for selecting equipment 7. Conducting learning assessment in laboratories 8. Types, properties, and organization of materials 9. Solutions and reagents preparation 10. Work safety in laboratories 11. Laboratory waste management 12. Hazardous experimental techniques 13. MSDS	
<b>References</b>	<b>Main Source</b>	
	U.1. Djupri Padmawinata, dkk. (1983). <i>Pengelolaan Laboratorium IPA</i> . Jakarta: P2LPTK, Depdikbud U.2. Sumanto Imam Khasani, Keselamatan Kerja di Laboratorium, Gramedia	
	<b>Supplement</b>	
	P.1. Archenhold, et all. (1978). <i>School Science Laboratories, A Handbook of Design Management and Organization</i> . London : John Murray P.2. Everet, K. & Hughes, D. (1979). <i>A Guide to Laboratory Design</i> , London : Butterworths P.3. L. Tobing, Rangke. (1972). <i>Penuntun Demonstrasi dan Praktikum Sederhana dalam Ilmu Kimia</i> . Medan : Monora P4. Manufacturing Chemists Association. (1972). <i>Guide for Safety in The Chemical Laboratory</i> . New York : Van Nostrand Reinhold Company	
<b>Learning Media</b>	<b>Software</b>	<b>Hardware</b>
	-	Whiteboard and stationery
<b>Team-Teaching</b>	-	
<b>Prerequisite Course</b>	Basics of Analytical Chemistry	

### Learning Activities

Week	Sub-Learning Outcomes-Course	Indicators	Criteria & Assessment Form	Learning Method (Time Estimation)	Learning Material (Reference)	Assessment Weight (%)
1	L1. Students are able	Explaining the definitions,	<b>Assessment criteria:</b>	Contextual Instruction	definitions,	3%

Week	Sub-Learning Outcomes-Course	Indicators	Criteria & Assessment Form	Learning Method (Time Estimation)	Learning Material (Reference)	Assessment Weight (%)
	to master theoretical concepts on definitions, objectives, and scope of laboratory management (M2)	objectives, and scope of laboratory management	Accuracy of the answer <b>Assessment Form:</b> Written test <b>Assessment Instrument:</b> Test Items	(TM : 1 x (2 x 50'))	objectives, and scope of laboratory management (M2) (U1, U2, P1, P2, P3, P4)	
2	L2. Students are able to master theoretical concepts on definitions and functions of laboratory (M2)	Explaining the definitions and functions of a laboratory	<b>Assessment criteria:</b> Accuracy of the answer <b>Assessment Form:</b> Written test, Observation <b>Assessment Instrument:</b> Test Items, observation sheets, assessment rubric	Contextual Instruction (TM : 1 x (2 x 50'))  Designing an ideal laboratory layout (BT-BM : 2 x (2 x 60'))	Definitions and functions of ideal laboratory design and layout (U1, U2, P1, P2, P3, P4)	6%
	L3. Students are able to create an ideal laboratory design and layout (M2)	Developing ideal laboratory design and layout				
3	L4. Students are able to explain the types and functions of laboratory equipment (M2)	Explaining the types and functions of laboratory equipment	<b>Assessment criteria:</b> Accuracy of the answer <b>Assessment Form:</b> Written test <b>Assessment Instrument:</b> Test Items	Contextual Instruction (TM : 1 x (2 x 50'))	Types and functions of laboratory equipment (U1, U2, P1, P2, P3, P4)	3%
4	L5. Students are able to manage practicum equipment based on procedures (M3)	Managing practicum equipment based on procedures (M3)	<b>Assessment criteria:</b> Accuracy of the answer <b>Assessment Form:</b> Written test <b>Assessment Instrument:</b> Test Items	Contextual Instruction (TM : 1 x (2 x 50'))	Proper management of practicum tools (U1, U2, P1, P2, P3, P4)	3%
5	L6. Students are able to select the right equipment	Selecting the right equipment according to their needs and available	<b>Assessment criteria:</b> Accuracy of the answer <b>Assessment Form:</b>	Contextual Instruction (TM : 1 x (2 x 50'))	Selection of the right equipment according to their	3%

Week	Sub-Learning Outcomes-Course	Indicators	Criteria & Assessment Form	Learning Method (Time Estimation)	Learning Material (Reference)	Assessment Weight (%)
	according to their needs and available funds (M2, M3)	funds	Written test <b>Assessment Instrument:</b> Test Items		needs and available funds (U1, U2, P1, P2, P3, P4)	
6	L7. Students are able to conduct activities in the laboratory (M1)	Assessing laboratory activities	<b>Assessment criteria:</b> Accuracy of the answer <b>Assessment Form:</b> Written test <b>Assessment Instrument:</b> Test Items	Contextual Instruction (TM : 1 x (2 x 50')	Assessment of laboratory activities (U1, U2, P1, P2, P3, P4)	3%
7	Mid-Term Exam			Written Exam (TM : 1 x (2 x 50')		25%
8-9	L8. Students are able to manage materials correctly (M2, M3)	Managing ingredients according to their nature	<b>Assessment criteria:</b> Accuracy of answer <b>Form of Assessment:</b> Written test <b>Assessment Instrument:</b> test items	Contextual Instruction (TM : 2 x (2 x 50')	Material management according to its nature (U1, U2, P1, P2, P3, P4)	3%
10	L9. Students are able to prepare solutions and reagents (M3)	Making solutions and reagents	<b>Assessment criteria:</b> Accuracy of answer <b>Form of Assessment:</b> Written test <b>Assessment Instrument:</b> test items	Contextual Instruction (TM : 1 x (2 x 50')	The Creation of reagents and solutions (U1, U2, P1, P2, P3, P4)	3%
11	L10. Students are able to work safely in laboratories (M1)	Identifying the equipment needed and the attitude taken to work safely	<b>Assessment criteria:</b> Accuracy of answer <b>Form of Assessment:</b> Written test	Contextual Instruction (TM : 1 x (2 x 50')	The equipment and attitude needed to work safely (U1, U2,	3%

Week	Sub-Learning Outcomes-Course	Indicators	Criteria & Assessment Form	Learning Method (Time Estimation)	Learning Material (Reference)	Assessment Weight (%)
			<b>Assessment Instrument:</b> test items		P1, P2, P3, P4)	
12-13	L11. Students are able to manage laboratory waste (M1, M2)	Managing waste properly	<b>Assessment criteria:</b> Accuracy of answer <b>Form of Assessment:</b> Written test, observation <b>Assessment Instrument:</b> test items, observation sheet, assessment rubric	Contextual Instruction (TM : 1 x (2 x 50')  Assignment 2: Conducting observations in research/school/hospital laboratories and writing reports. (BT-BM: 2 x (2 x 60 '))	Waste management (U1, U2, P1, P2, P3, P4)	6%
14	L12. Students are able to explain hazardous experiment techniques (M2)	Explaining hazardous experiment techniques	<b>Assessment criteria:</b> Accuracy of answer <b>Form of Assessment:</b> Written test <b>Assessment Instrument:</b> test items	Contextual Instruction (TM : 1 x (2 x 50')	Hazardous experiment techniques (U1, U2, P1, P2, P3, P4)	3%
15	L13. Students are able to recognize material safety data sheets (M2)	Recognizing the material safety data sheet (MSDS)	<b>Assessment criteria:</b> Accuracy of answer <b>Form of Assessment:</b> Written test, observation <b>Assessment Instrument:</b> test items, observation sheet, assessment rubric	Contextual Instruction (TM : 2 x (2 x 50')  Assignment 3: Investigating the MSDS of a chemical and present it. (BT-BM: 2 x (2	MSDS (U1, U2, P1, P2, P3, P4)	6%

Week	Sub-Learning Outcomes-Course	Indicators	Criteria & Assessment Form	Learning Method (Time Estimation)	Learning Material (Reference)	Assessment Weight (%)
				x 60 '))		
16	Final Exam			Written Exam (TM : 2 x (2 x 50')		30%

### ASSESSMENT

No.	Components	Weight
1.	Classroom Activities	10%
2.	Assignments	35%
3.	Mid-Term Exam	25%
4.	Final Exam	30%
	Total	100%

$$\text{Student Mark} = \frac{(\text{Score of Classroom Activity} \times 10) + (\text{Score of Assignments} \times 35) + (\text{Score of Mid-Term Exam} \times 25) + (\text{Score of Final Exam} \times 30)}{100}$$