

MODULE OUTLINE

1. **Course Title** : General Chemistry I Laboratory
2. **Code/Credit** : MKK17111/1 Credit
3. **Prerequisite** : -
4. **Status** : Compulsory/elective

5. **Short description of the course**

This course is designed for students to learn the skills used in practical chemistry, to introduce the laboratory apparatus, to conduct safe experiment, to get and process reliable data from the experiments.

6. **Course objectives**

This course aims to introduce several simple laboratory glassware, several variations of preparation techniques and material treatments as basic skills working in the chemical laboratories.

7. **Learning outcomes**

Upon completing the course, students will be able to:

- i. Use the laboratory apparatus.
- ii. Conduct measurements, data gathering and data processing.
- iii. Identify chemical hazards based on pictogram labels on the chemicals.

8. **Course contents**

We will cover topics as follows:

1. Experiment : Laboratory Techniques and Work Safety on Laboratory
2. Experiment P : Introduction of Lab Equipment and Basic Techniques at Laboratory
3. Experiment A-1 : Kinetics reaction of Permanganate Ion with Oxalic Acid
4. Experiment A-2 : The Decrease in Freezing Point of Solution
5. Experiment B-1 : Determination of Commercial Vinegar Content
6. Experiment B-2 : Analysis of Water Hardness
7. Experiment C-1 : Analysis of Electrical Conductivity
8. Experiment C-2 : Acidity Control of Buffer Solution
9. Final exam

9. Assessments

For every lab work topics, the students are evaluated by Instructors for 3 aspects of:

- i. Pretest
- ii. Lab skill
- iii. Lab work report

Those 3 aspects contribute for 60% final grade. The other 40% will be from in-class exam.

Guidelines for the conversion of the numeric scores into the alphabetic grades:

Scores (%)	Grades	Conversion
90.0–100	A	4.00
85.0–89.9	A–	3.75
80.0–84.9	A/B	3.50
75.0–79.9	B+	3.25
65.0–74.9	B	3.00
60.0–64.9	B–	2.75
55.0–59.9	B/C	2.50
50.0–54.9	C+	2.25
40.0–49.9	C	2.00
35.0–39.9	C–	1.75
30.0–34.9	C/D	1.50
25.0–29.9	D+	1.25
15.0–24.9	D	1.00
0.0–14.9	E	0.00

10. References

1. Anonim, 2000, Petunjuk Praktikum Kimia Dasar I, Laboratorium Kimia Dasar FMIPA UGM.
2. Anonim, 2000, Petunjuk Praktikum Kimia Dasar II, Laboratorium Kimia Dasar FMIPA UGM.
3. Beran, J.A., 2010, Chemistry in the Laboratory, 2nd ed, John Wiley and Son., New York, USA.
4. Fiesher, L. F. and Fiesher, M., 1998, Organic Chemistry, 3rd ed., Longman, London.
5. Heasley, L., Christensen, V. J., Heasley, G. E., 1997, Chemistry and Life in the Laboratory, 4th ed., Prentice Hall. Inc, USA.

11. Weekly schedule

Week No.	Topics	Sub-topics	Method of Delivery	Assessment
1	Experiment : Laboratory Techniques and Work Safety on Laboratory	<ul style="list-style-type: none">• The introduction of some simple laboratory glassware• The introduction of some variant preparation techniques and material treatments	Lecture and discussion	
2	Experiment P : Introduction of Lab Equipment and Basic Techniques at Laboratory	<ul style="list-style-type: none">• Preparation of solution• Dilution of solution	Labwork	Pre-test Lab-skill Lab-report
3	Experiment A-1: Kinetics reaction of Permanganate Ion with Oxalic Acid	<ul style="list-style-type: none">• Reaction rate• Permanganate titration	Labwork	Pre-test Lab-skill Lab-report
4	Experiment A-2: The Decrease in Freezing Point of Solution	<ul style="list-style-type: none">• Molality• Colligative properties: Depression of freezing point	Labwork	Pre-test Lab-skill Lab-report

5	Experiment B-1: Determination of Commercial Vinegar Content	<ul style="list-style-type: none"> • Acid-base titration 		
6	Experiment B-2: Analysis of Water Hardness	<ul style="list-style-type: none"> • Water hardness 	Labwork	Pre-test Lab-skill Lab-report
7	Experiment C-1: Analysis of Electrical Conductivity	<ul style="list-style-type: none"> • Electrolytes and nonelectrolytes conductivity 	Labwork	Pre-test Lab-skill Lab-report
8	Experiment C-2: Acidity Control of Buffer Solution	<ul style="list-style-type: none"> • Buffer solution 	Labwork	Pre-test Lab-skill Lab-report
9	Final Exam	Cover above topics (W3-8)		