



Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
Isulan, Sultan Kudarat
College of Industrial Technology
Second Semester S.Y. 2024-2025



MST 002

CHEMISTRY FOR INDUSTRIAL

TECHNOLOGISTS 2

2nd Semester
School Year 2024 – 2025

Prepared by:

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UNIVERSITY VISION

A leading University in advancing scholarly innovation, multi-cultural convergence, and responsive public service in a borderless Region.

UNIVERSITY MISSION

The University shall primarily provide advanced instruction and professional training in science and technology, agriculture, fisheries, education, and other relevant fields of study.

It shall also undertake research and extension services, and provide progressive leadership in its areas of specialization.

UNIVERSITY GOAL

*Deliver quality service to stakeholders to address current and future needs in instruction, research, extension, and production
Observe strict implementation of the laws as well as the policies and regulations of the University.*

Acquire with urgency state-of-the-art resources for its service areas;

Bolster the relationship of the University with its local and international customers and partners.

Leverage the qualifications and competences in personnel action and staffing.

Evaluate the efficiency and responsiveness of the University systems and processes.

UNIVERSITY OBJECTIVES

- a. Enhance competency development, commitment, professionalism, unity and true spirit of service for public accountability, transparency and delivery of quality services;
- b. Provide relevant programs and professional trainings that will respond to the development needs of the region.
- c. Strengthen local and international collaborations and partnerships for borderless programs;
- d. Develop a research culture among faculty and students;
- e. Develop and promote environmentally-sound and market-driven knowledge and technologies at par with international standards;
- f. Promote research-based information and technologies for sustainable development;
- g. Enhance resource generation and mobilization to sustain financial viability of the University.

Program objectives and its relationship to University Objectives:

PROGRAM OBJECTIVES (PO)	UNIVERSITY OBJECTIVES						
A graduate of BS in Industrial Technology (CMO No.13 s.2023) can:	a	b	c	d	e	f	g
a. Analyze broadly defined industrial technology processes by using analytical tools that enhance creativity, innovativeness, intellectual curiosity to improve methods, processes and systems that meet industry standards;	✓	✓					
b. Implement broadly defined industrial systems, components, products, or processes to meet specific industry needs with proficiency and flexibility in the area of specialization in accordance with global standards;	✓	✓		✓			
c. Apply appropriate techniques, resources and state of the art industrial technology tools and processes to improve and increase entrepreneurial activities upholding the safety and health standards of business and industry;	✓		✓	✓	✓	✓	✓
d. Communicate with diverse groups of clienteles the appropriate cultural language with clarity and persuasion, in both oral and written forms, including understanding and giving of clear instructions, high comprehension level, effectiveness in delivering presentations and writing documents, and articulating technological innovation outputs;	✓	✓	✓				
e. Develop leadership and management skills in a team based environment by making informed decisions, keeping the team motivated, acting and delegation responsibility, and inspiring positive changes in the organization by exercising responsibility with integrity and accountability in the practice of one's profession;	✓			✓			
f. Ability to demonstrate enthusiasm and passion for continuous personal and professional development in broadly defined industrial technology and effecting positive changes in entrepreneurial and industrial endeavor;	✓						✓
g. Recognize the need for, and an ability to engage in life-long learning.	✓	✓	✓	✓	✓	✓	✓

1. Course Code : **MST 002**
 2. Course Title : **CHEMISTRY FOR INDUSTRIAL TECHNOLOGISTS 1**
 3. Pre-requisite : None
 4. Credit : **3 Units Lecture, 1 Unit Laboratory**
 5. Course Description : This course deals with the general concepts of chemistry that are emphasized through classroom and laboratory experience. It discusses chemical bonds, compound formations, chemical reactions, structures and properties of matter. Specifically, this course discusses the core concepts of atomic and molecular bonding with the fundamental knowledge in electron configuration. Furthermore, the laboratory part includes activities and experiments that aims to strengthen chemical concepts and principles learned by the students as well as develop their skills in the use of common laboratory apparatus, safety in the laboratory, data analysis and interpretation of results.

6. Course Learning Outcomes and Relationship to Program Educational Objectives:

Course Learning Outcome	a	b	c	d	e	f	g
At the end of the semester, the students must be able to:							
a) discuss the basic concepts of the chemistry, electron configuration and periodic properties;	✓		✓	✓	✓	✓	✓
b) explain the chemical principles and concepts of structures and bonding of common materials;	✓	✓		✓		✓	✓
c) identify and discuss the chemical processes that take place in all matter around us and how these affects us;	✓	✓		✓		✓	✓
d) identify key chemistry concepts related to Industrial Technology; and				✓	✓	✓	✓
e) conduct experiments and be able to state experimental observations that relate the principles and fundamental concepts of chemistry to Industrial Technology profession.	✓	✓	✓	✓	✓	✓	✓

Course Content

Course Objectives, Topics, Time Allotment	Desired Student Learning Outcomes	Outcome-Based Assessment (OBA) Activities	Evidence and Outcomes	Course Objectives	Program Outcomes	Value Integration
Course Orientation (1 hour)						
Topic: Course Overview, Course Requirements, Grading System (30 minutes)						
Discuss the scope of the course, course requirements, and grading system.	Students can be aware of the course overview, course requirements, and grading system.	Class discussion	Students' Responses in Question and Answer			Value of Appreciation; Value of Respect
A. Midterm Topics (28 hours)						
1. Electronic Structure of atoms	1.1 Students can describe the duality of matter, describe the electronic structure of atoms in terms of main energy levels, sub levels, and orbitals, determine the magnetic property of the atom based on its electronic configuration.	Class discussion; Reporting, Brainstorming; and Individual Activity	Students' Responses in Question and Answer; and Graded Individual Activity	a, d, e, f, g	a, b, f, g, h	Value of Appreciation; Value of Patience; Value of Hardwork

Electronic Structure and Periodicity	2.1 Students can relate the periodic recurrence of similar properties among elements in the periodic table in terms of electronic structure, describe and explain the trends in atomic properties in the periodic table	Class discussion; Reporting, Brainstorming; and Individual Activity	Students' Responses in Question and Answer; and Graded Individual Activity	a, d, e, f, g	a, b, f, g, h	Value of Appreciation; Value of Patience; Value of Hardwork
3. Chemical bonding	3.1 Students can explain the basic concept of chemical bonding that exists between atoms.	Class discussion; Reporting, Brainstorming; and Individual Activity	Students' Responses in Question and Answer; and Graded Individual Activity	a, d, e, f, g	a, b, f, g, h	Value of Appreciation; Value of Patience; Value of Hardwork
4. Covalent Bonding	4.1 Students can describe covalent bonding in terms of electron sharing; apply the octet rule in the formation of molecular covalent compound; draw Lewis's structure of molecular covalent compounds	Class discussion; Reporting, Brainstorming; and Individual Activity	Students' Responses in Question and Answer; and Graded Individual Activity	a, d, e, f, g	a, b, f, g, h	Value of Appreciation; Value of Patience; Value of Hardwork

B. Final Topics: 25 hours

5. Modern Materials	5.1 Students can understand various importance of chemistry in industrial application.	Class discussion; Reporting, Brainstorming; and Individual Activity	Students' Responses in Question and Answer; and Graded Individual Activity	a, d, e, f, g	a, b, f, g, h	Value of Appreciation; Value of Patience; Value of Hardwork
6. Organic Chemistry -Alkanes -alkenes -alkynes -alcohol -aldehydes -ketones -carboxylic acids -amines	5.1 Students can demonstrate their understanding on properties of organic compounds and polymers in terms of their structure.	Class discussion; Reporting, Brainstorming; and Individual Activity	Students' Responses in Question and Answer; and Graded Individual Activity	a, d, e, f, g	h, i, j	Value of Appreciation; Value of Patience; Value of Hardwork

TOTAL: 54 hours

Lectures: 44 hours

Examination/Quizzes (Midterm and Final): 10 hours

Course Evaluation

Course Requirements:

- Examinations (Written/Practical), Class Participation (Quizzes/Seatwork, Assignments/Plates, Boardwork/Oral Recitation, Group Work/Presentation), Laboratory Work (Reports, Performance), Projects

Grading System:

MIDTERM / FINAL		
Methods of Assessment		Weights
I.	Lecture	70%
• Examination	50%	
• Quizzes/Seatwork	10%	
• Assignments/Worksheets	10%	
• Board work/Oral Recitation	15%	
• Group Work/Presentation/Project	15%	
	Total	100%
II.	Laboratory	30%
• Practical Examination	50%	
• Laboratory Report	25%	
• Laboratory Performance	25%	
	Total	100%
	Total	100%

$$\text{FINAL GRADE} = \frac{(\text{MIDTERM GRADE} + \text{FINAL TERM GRADE})}{2}$$

Schedule of Examination

Midterm	-	March	2025
Final Term	-	May	2025
Classes End	-	June	2025

References

Textbooks:

1. Brown, T. L, LeMay H.E.S., Bursten, B.E., Murphy, C.J., Woodward P.M. (2012). Chemistry: The Central Science 12th edition. Pearson Prentice Hall.
2. Chang, R. (2010). Chemistry. 10th edition. McGraw-Hill Companies, Inc.
3. Silberberg, M., Amateis, P. (2015). Chemistry: The Molecular Nature of Matter and Change. 7th Edition. McGraw-Hill Education
4. Zumdahl S.S., Zumdahl S. A., DeCoste, D. (2018). Chemistry. 10th edition. Cengage Learning.

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