



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



#### 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	b	c	d	e	f	g
A graduate of BS in Industrial Technology can:							
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, and symbolic representations, the mole concept and its applications, gas laws, solutions and colloids, acids, bases, salts and even chemical equilibrium. Specifically, this course discusses the core concepts of phases of matter such as the intermolecular forces and its properties. 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 of matter and its 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
<b>A. Midterm Topics</b>						
<b>Topic: Course Overview, Course Requirements, Grading System (30 minutes)</b>						
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
<b>Topic: Introduction to Chemistry (4 hours)</b>						
1. Introduction to Chemistry and Matter  2. Measurement	1.1 Students can classify matter and its characteristics.  2.1 Students can able to identify units of measurement, expressing significant figures, conversion of units through dimensional analysis.	Class discussion; Reporting; Brainstorming; and Individual Activity	Students' Responses in Question and Answer	a, b, d, e, g	a, d, e, g,	Value of Appreciation; Value of Patience; Value of Hardwork
<b>Topic: Laboratory safety, Matter and its Properties (28.5 Hours)</b>						
1. Introduction to laboratory safety	1.1 Students can understand the fundamentals of laboratory safety.	Class discussion; Reporting; Brainstorming; and Individual Activity	Students' Responses in Question and Answer; and	a, b, d, e, g	b, c, f, h	Value of Appreciation; Value of

	1.2 Students can identify and illustrate the Globally Harmonized System (GHS) and pictograms.		Graded Individual Activity			Patience; Value of Hardwork
2. Atoms, Molecules and Ions	2.1 Students can examine the basic structure of atoms and its compositions, and applying nomenclature of 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
3. Stoichiometry	3.1 Students can identify and balance basic chemical reactions and equations, relate chemical formulas, illustrate the mole concept in relation to Avogadro's Number and mass.	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

Gases	4.1 Students can examine different substances that exists as gases and its behavior in correlation with the ideal gas equation.	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
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B. Final Topics						
Topic: Properties and changes of Matter (21 hours)						
5. Electronic Structure of atoms	5.1 Students can describe the duality of matter, describe the electronic structure of atoms in terms of main energy levels, sublevels, 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
6. Electronic Structure and Periodicity	6.1 explain 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

Chemical bonding	7.1 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
8. Covalent Bonding	8.1 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>Topic: Organic Chemistry (6 hours)</b>						
9. Organic Chemistry	9.1 Students can understand the 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/Plates	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	- October	2024
Final Term	- December	2024
Classes End	- December	2024

## 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. 7<sup>th</sup> Edition. McGraw-Hill Education
4. Zumdahl S.S., Zumdahl S. A., DeCoste, D. (2018). Chemistry. 10<sup>th</sup> edition. Cengage Learning.

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