



Subject Teacher : Kawsar Hossain (Instructor)

Subject Name : **Chemistry**

Subject Code : 25913

Semester : All 3rd Gd

Reference Book : Chemistry (Publisher : Haque,)

Reference Book : Higher secondary Chemistry (paper 1st and 2nd)

Writer Dr. Gazi Md. Ahsanul Karim. And Md. Robiul Islam

Subject Aims:

To provide the student with an opportunity to develop knowledge, skill and attitude in the area of Chemistry with Special emphasis on:

1. To understand mole concept and volumetric analysis.
2. To represent the formation of bonds in molecules.
3. Able to select appropriate materials used in construction.
4. Apply knowledge to enhance operative life span of engineering material and structure by various protective methods.

Description:

Chemistry is a basic science subject which is essential to all engineering courses. It gives knowledge of engineering material, their properties related to application and selection of material for engineering application. It is intended to teach students the quality of water and its treatment as per the requirement and selection of various construction materials and their protection by metallic and organic coatings. The topics covered will provide sufficient fundamental as well as background knowledge for the particular branch.

Subject Outcome:

Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.

Marks	Grade Point	Letter Grade	Marks	Grade Point	Letter Grade
80>	4.00	A+	55-59	2.75	B
75-79	3.75	A	50-54	2.50	C+
70-74	3.50	A-	45-49	2.25	C
65-69	3.25	B+	40-44	2.00	D
60-64	3.00	B	0-39	0.00	F

Mark Distribution (for 200 Marks)			
Theory Marks		Practical Marks	
Midterm	30	PC	25
Class test	10	PF	25
Quiz test	10	-	-
Final	90	-	-
-	-	Assignment	10
Total	140	Total	60

Class Timing Distribution

Particulars	Time
Greeting with students	05 Minutes
Previous Class Review	05 Minutes
Present Class Topic Discussion and Lecture Delivery	30 Minutes
Present Class Topics Review	05 Minutes

	Lecture	Chapter	Learning Area	Learning Outcome	Class/lab Supporting Equipment's
	01	1. Atomic Structure	1.1 Define Element, atoms and molecules. 1.2 Define molecular mass, atomic number, mass number, mole and Aveogadro's number. 1.3 Distinguish between atom and molecule.	At the end of the class students will able to: 1. Elements, atoms, molecules, Fundamental particles of atoms. 2. Electronic configuration. 3. atomic number, mass number of an atom.	Theory Class: YTD Link https://youtu.be/rid3gnrK6GI
	02		1.4 Describe Fundamental particle of atom. 1.5 Define isotope, isobar and isotone. 1.6 Define Orbit and Orbital. 1.7 Explain Quantum number. 1.8 Describe Electronic configuration based on Aufbau principle, Hunds rule and Paulis exclusion principle.		
	03		Quiz Test-1 : Chapter 01	At the end of the lesson students will find on this An interactive quiz and worksheet will test how much information you know about this lesson.	Text book Assignment Exam related Materials.

04	2. Symbol, valency and formula	2.1 Define Symbol, Valency and formula. 2.2 Discuss the variations of valency. 2.3 Describe active and latent valency. 2.4 Describe Radicals.	At the end of the class students will able to: 1. Describe Symbol, valency and radical.	Theory Class: YTD Link https://www.youtube.com/watch?v=mZ7bp2kBnDk
----	---------------------------------------	--	--	--

05	3. Gas	3.1 Define gas and vapor. 3.2 Mention the Characteristic of gas. 3.3 Distinguish between gas and vapor.	At the end of the class students will able to: 1. Describe Properties of gas and its law	Theory Class: YTD Link https://youtu.be/uJ3VJtqyYOU
06		3.4 Define STP, NTP and Absolute temperature. 3.5 Mention the Boyle's, Charle's and Avogadro's law. 3.6 Establish the ideal gas equation ($PV=nRT$)		Text book Assignment
07		Class Test 01: Chapter 1 Chapter 2 & Chapter 3	At the end of the lesson students will find on this An interactive quiz and worksheet will test how much information you know about this lesson.	Exam related Materials.

08	4. Chemical bond	4.1 Define Chemical Bond. 4.2 Define Octet rule. 4.3 Explain Ionic bond, Covalent bond and Co-ordinate covalent bond.	At the end of the class students will able to: 1. Describe different types of bonds. 2. Find the different types of bonds.	Theory Class: YTD Link https://www.youtube.com/watch?v=BfV2kWcZgHY
09		4.4 Mention the Characteristic of ionic and covalent compoun 4.5 Differentiate between ionic and covalent compounds.		Theory Class: YTD Link https://www.youtube.com/watch?v=BfV2kWcZgHY
10	5. Acid, base and salt	5.1 State Modern concept of Acid and Base. 5.2 List the properties of acid and base. 5.3 Classify Salt . 5.4 Explain Basicity of an acid and acidity of a base.	At the end of the class students will able to: Define Acid, base and salt	Theory Class: YTD Link https://www.youtube.com/watch?v=MI5kcddkM8w

09	Quiz Test -02	Chapter — 03,04	At the end of the lesson you will find on this interactive quiz and worksheet will test how much information you know about	
----	----------------------	------------------------	---	--

	11	6. Ionic equilibrium	6.1 Explain pH and pH scale. 6.2 Define Normality, Molarity and Molality. 6.3 Define Primary and Secondary Standard Substances. 6.4 Define Standard Solution, Titration and Indicator. c 5. 6.6 Describe Importance of pH in Agriculture and Chemical Industries.	At the end of the class students will able to: Describe Buffer solution, pH and its application	Theory Class: YTD Link https://www.youtube.com/watch?v=fbXlZr2A6tQ
	12	Class Test- 02:	Chapter 05,06,07	At the end of the lesson you will find on this interactive quiz and worksheet will test how much information you know about	

MID TERM EXAM-2026

12	7. Chemical reaction	7.1 Define Exothermic and endothermic reaction 7.2 Define Chemical Reaction 7.3 Classify Chemical Reaction. 7.3 Describe Catalyst and Catalysis. . 7.5 Mention the uses of Catalyst in Industries.	At the end of the class students will able to: State Different types of reaction and catalyst	Theory Class: YTD Link https://www.youtube.com/watch?v=O5DphPftOXs
13	8. Oxidation and reduction	8.1 Describe Modern concept of Oxidation and Reduction. 8.2 Define Oxidizing agent and Reducing agent. 8.3 Describe Simultaneous process of Oxidation and Redu 8.4 Explain the Oxidation number / state. . 8.5 Distinguish Between Oxidation number and Valency.	At the end of the class students will able to: Calculate oxidation and reduction number	Theory Class: YTD Link https://www.youtube.com/watch?v=dg0QQ8GO6tc

14	9. Water	9.1 Define Hard and Soft water. 9.2 Define Hardness of water. 9.2 Describe permutit process to removal the 9.3 Mention the Advantage and disadvan 9.4 Describe Reverse Osmosis process.	At the end of the class students will able to: Describe Hardness of water and its removing process.	Theory Class: YTD Link https://www.youtube.com/watch?v=o2rPauDONWk
----	-----------------	---	--	--

15	Class Test -03	Chapter- 07 Chapter 08 Chapter 09	At the end of the lesson you will find on this interactive quiz and worksheet will test how much information you know about	
15	10. Electro chemistry	10.1 Define Electrolyte, Electrolysis and Electrode 10.2 State the Mechanism of Electrolysis process 10.3 Mention the Process of Chrome Electro plating 10.4 Define Galvanizing. 10.5 Mention the importance of Galvanizing.	At the end of the class students will be able to: Illustrate Electrolysis process	Theory Class: YTD Link https://youtu.be/pgFDZaKn63Q?list=PLuTExhEg439lLe6loU2aXrhVTbqpx9dw
16	11. Basic concept of organic chemistry	11.1 Define organic chemistry. 11.2 Classify organic compound 11.3 Mention the Catenation properties of Carbon.	At the end of the class students will be able to: State organic chemistry	Theory Class: YTD Link https://www.youtube.com/watch?v=eSMuLWj2sRU
17		11.4 Distinguish between organic & inorganic compound 11.5 Explain homologous series of organic compound		
18		11.6 State molecular & structural formula of methane, ethane propane & butane. 11.7 Describe functional group of organic compounds		

19	Quiz Test 03	Chapter 09,10	At the end of the lesson you will find on this interactive quiz and worksheet will test how much information you know about	
20	12. Aliphatic Hydrocarbon	12.1 Define hydrocarbon, saturated and unsaturated hydrocarbon 12.2 Describe nomenclature of alkane, alkene and alkyne IUPAC	At the end of the class students will able to: Describe Various type of Hydrocarbon	Theory Class: YTD Link https://www.youtube.com/watch?v=iSpPGdl1rn0

		system. 12.3 Mention the uses of hydrocarbon methane, ethane and ethyne.		
21	13. Alcohol	Alcohol 13.1 Define alcohol. 13.2 Describe the classification of alcohol. 13.3 Define absolute alcohol, rectified sprit and power alcohol. 13.4 Define enzyme and fermentation.	At the end of the class students will able to: State Different types of alcoho	Theory Class: YTD Link https://www.youtube.com/watch?v=fZ63TVUpGLU

		Class Test-04	Chapter 11 ,12 & 13	At the end of the lesson you will find on this interactive quiz and worksheet will test how much information you know about	
22	14. Aromatic Compound	14.1 Define aromatic compound. 14.2 Define aromaticity and Hackle's Theory. 14.3 Describe Synthesis Benzene from phenol, acetylene and benzoic acid. 14.4 Mention the uses of benzene.	At the end of the class students will able to: Describe Aromatic compound and its use	Theory Class: YTD Link https://youtu.be/OUHCac1F4m w	
23	15. Vocational chemistry	15.1 Define Food security, Natural and approved chemical preservatives. 15.2 Describe the canning process of Mango and Pineapple. 15.3 Describe the canning process of Fish and Meat.	At the end of the class students will able to: Explain Food security and Processing	Theory Class: YTD Link https://www.youtube.com/watch?v=-ULiZONXIPU	
24	Practical Class-01	Use of laboratory tools and safety measures.11 Follow Laboratory Rules and OSH. 1.2 Wear Apron, Safety Glass, Mask and Gloves.	End of the lesson students will able to known about laboratory equipment.	YTD Link https://www.youtube.com/watch?v=EtWWXhQUTxg	

			<p>1.3 Use of a conical flask, Wash bottle, Burette, Pipette.</p> <p>1.3 Use a flammable substance according to instruction."</p> <p>1.4 Importance of minimum use of chemicals. Use of a Fast aid box.</p> <p>1.6 Follow DO's or Don't in the laboratory.</p>		
25	Practical Class 2,4	<p>1. Perform Preparation of decimolar (0.1M) Na_2CO_3 Solution.</p> <p>2. Solution Perform Preparation of decimolar (0.1M) NaOH Solution</p>	<p>End of the lesson students will be able to know about Perform Preparation of various strength of solution</p>	<p>YTD Link https://www.youtube.com/watch?v=Fp0IL6bCKVw https://www.youtube.com/watch?v=Fumj6J8ugCA</p>	
26	Review Class-(1-4)	For Chapter-1&2,	<p>At the end of the review class students will understand their problem at those chapters and solve it.</p>	<p>Text book, Calculator, and all assignments.</p>	

27	Review Class-(5-9)	For Chapter-4&5	At the end of the review class students will understand their problem at those chapters and solve them.	Text book, Calculator, and all assignments.
----	---------------------------	----------------------------	---	---

28	Practical Class-3	Determine the strength of H ₂ SO ₄ Solution by decimolar (0.1M). Perform Preparation of decimolar (0.1M) NaOH Solution	End of the lesson students will be known about to Calculate the strength of unknown solution	Exam Materials.
29	Practical Class-5	Determine the strength of Hydrochloric acid (HCl) Solution by decimolar (0.1M) NaOH Solution	End of the lesson students will be known about to Calculate the strength of unknown solution	YTD Link- https://youtu.be/culc501BoA
31	Practical Class-6	Measure the pH value of an unknown solution using pH meter and paper.	Identify Nature of different type of solution	
32	Practical Class-7	Identify Radicals: Cu ²⁺ , Al ³⁺ , Fe ²⁺ , Fe ³⁺ , Ca ²⁺ , Zn ²⁺ , NO ₃ , Cl ⁻ , SO ₄ ²⁻ , CO ₃ ²⁻	Perform Qualitative analysis of radicals and salt	YTD Link https://www.youtube.com/watch?v=Jbp0ml8styM

33	Practical Class-8	Identify salt: (Cu(NO ₃) ₂ , AlCl ₃ , FeSO ₄ , FeCl ₃ , CaCO ₃ ,)	Perform Qualitative analysis of radicals and salt	YTDLink https://www.youtube.com/watch?v=Yg7GdMVayIE https://www.youtube.com/watch?v=zGtmLR-8L0o
34	Review Practical - 7&8	Perform Qualitative analysis of radicals and salt	End of the review class students will be understand their problem at those chapter and solved.	YTD Link https://www.youtube.com/watch?v=rHxxLYzJ8Sw
35		Class Test-04 For Chapter-06	At the end of the lesson you will find on this interactive quiz and worksheet will test how much information you know about	Text book Assignment Exam related Materials.

36	Practical Class-9	Perform Preparation of vinegar from Acetic acid	Perform Preparation of vinegar and sanitizer	YTD Link https://www.youtube.com/watch?v=vFBs_trf5qU
37	Review Practical -9	Perform Preparation of vinegar and sanitizer	End of the review class students will be understand their problem at those chapter and solved.	YTD Link https://www.youtube.com/watch?v=vFBs_trf5qU
38	Practical Class-10	Perform Preparation of Sanitizer using Isopropyl Alcohol	Perform Preparation of vinegar and sanitizer	YTD Link https://www.youtube.com/watch?v=t6z8MJNcrkA

39	Quiz Test-04	Chapter 12 & 13	At the end of the lesson you will find on this interactive quiz and worksheet will test how much information you know about	Exam relevant materials.
40	Review Practical - 10	Perform Preparation of vinegar and sanitizer	End of the review class students will be understand their problem at those chapter and solved.	YTD Link https://www.youtube.com/watch?v=t6z8MJNcrkA
41		Perform Preparation of vinegar and sanitizer	End of the review class students will be understand their problem at those chapter and solved.	YTD Link https://www.youtube.com/watch?v=E4C3X26dxbM
42	Review Class-01	Chapter-1,2,&3	This review class a student can solve their problem.	Related Assignment Text book
43	Review Class-02	Chapter-4,5&6	This review class a student can solve their problem.	Related Assignment Text book
44	Review Class-03	Chapter-7&8	This review class a student can solve their problem.	Related Assignment Text book

45	Review Class-04	For Chapter-9,10&11	This review class a student can solve their problem.	Related Assignment Text book
46	Review Class-05	For Chapter-12&13	This review class a student can solve their problem.	Related Assignment Text book

	47	Review Class-06	For Chapter-4&14	This review class a student can solve their problem.	Related Assignment Text book
	48	Pre Final Exam 2024	Chapter-4,5,6,7&8	To attend exam, students will be take preparation final exam.	Exam relevant materials.

Semester Final Exam-2026