Veer Bahadur Singh Purvanchal University, Jaunpur-222003

Department of Chemistry

Faculty of Engineering & Technology
(U.N.S.I.E.T)

Syllabus For

Applied Chemistry (PTAC-101)

Diploma in Mechanical Engineering

(Production)

THEORY & PRACTICAL

(SEMESTER-I)

AS PER AICTE MODEL CURRICULUM

(Effective from the Session: 2026-2027)

BOS AY: 2026-27

A. Sivaiah
03.09.2026

03/09/2026

Department of Chemistry (FOET)
Approved
VPSingh 3,9,26

COURSE STRUCTURE & EVALUATION SCHEME FOR DIPLOMA IN MECHANICAL ENGINEERING

(PRODUCTION)

SEMESTER-I

Sr. No.	Course Tittle and Course Code	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
1.1	Communication Skills-I	4	-	2	4	20	10	30	50	2 ½	20	3	70	100
1.2	Applied Mathematics - I	5	-	-	4	20	-	20	50	2 ½	-	-	50	70
1.3	Applied Physics – I	5	-	2	5	20	10	30	50	2 ½	20	3	70	100
1.4	**Applied Chemistry (PTAC-101)**	**3**	**-**	**2**	**5**	**20**	**10**	**30**	**50**	**3**	**20**	**3**	**70**	**100**
1.5	Engineering Drawing-I	-	-	8	2	-	40	40	60	3	-	-	60	100
1.6	Basics of Information Technology	-	-	6	2	-	40	40	-	-	60	3	60	100
1.7	General Workshop Practice-I	-	-	8	2	-	40	40	-	-	60	4	60	100
GP (General Proficiency)		-	-	1	1	-	30	30	-	-	-	-	-	30
Total		19	-	29	25	80	180	260	260		180	-	**440**	**700**

BOS AY 2026-27

A. Srivastava
03/09/2026

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V P Singh
3.9.26

PTAC 101- APPLIED CHEMISTRY

DIPLOMA IN MECHANICAL ENGINEERING

(Production)

(SEMESTER-I)

L	T	P			CT		ES		Total (s)	Credits
3	0	0			20		50		70	3

CO1	Basic Understanding of Molecular Structure and Chemical Bonding.	K1
CO2	Developed Understanding of the Characteristics of Fuels and Lubricants.	K2
CO3	Understanding of Water Quality and its Assessment.	K3
CO4	Basic Understanding of Electrochemical Cell and Applications.	K4
CO5	Basic Ideas and Advantageous of Organic Molecule and Polymers.	K5

1. **Atomic Structure and Chemical Bonding** **(14 periods)**
   - 1.1 Fundamental Particles- Electrons, Protons and Neutrons.
   - 1.2 Bohr's Model of Atom.
   - 1.3 Definition of orbit and orbitals, shapes of s and p orbitals
   - 1.4 Modern Concept of Chemical Bonding: Sigma and Pi Bond. Elementary idea of Hybridization (e.g., NH_3 and H_2O), Molecular Orbital Theory (e.g., N_2 and O_2).
2. **Fuels and Lubricants** **(18 periods)**
   - 2.1.Definition, Classification, and Characteristics of Fuels.
   - 2.2.Calorific Value- Determination of Calorific Value Using Bomb Calorimeter Method.
   - 2.3.Lubricants: Definition and Properties.
   - 2.4.Industrial Application of Lubricants.
3. **Water and its Treatment** **(14 periods)**
   - 3.1 Classification of Water – Soft Water and Hard Water.
   - 3.2 Disadvantages Caused by Using Hard Water
   - 3.3 Removal of Hardness -Permutit Process.
   - 3.4 Definition of B.O.D and C.O.D.
4. **Electrochemistry and Corrosion** **(14 periods)**
   - 4.1 Electrochemical Cell.
   - 4.2 Electrode Potential and Nernst Equation.
   - 4.3. Definition of Corrosion and Factors Affecting Corrosion.
   - 4.4. Electrochemical Theory of Corrosion.
5. **Organic Compounds and Polymers** **(10 periods)**
   - 5.1.Definition and Classification of Organic Compounds.
   - 5.2. Definition of Polymer, Monomer and Degree of Polymerization.
   - 5.3 Preparation and Properties of PE, PS, PVC, Teflon and Nylon -66.
   - 5.4 Applications of Polymers in Industry and Daily Life.

REFERENCE BOOKS

1. Chemistry in Engineering by J.C. Kuricose& J. Rajaram, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. Engineering Chemistry by P.C. Jain & Monika Jain, Dhanapat Rai Publishing Company, New Delhi.

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PTAC 101- APPLIED CHEMISTRY

Diploma in Mechanical Engineering

(Production)

PRACTICAL

(SEMESTER-I)

L	T	P			PS		PE		Total (s)	Credits
0	0	02			10		20		30	2

COURSE OUTCOMES (COs)

CO1	Use of Different Analytical Instruments	K1, K2
CO2	Measure Molecular/System Properties Such as Strength, Surface Tension, Viscosity	K3, K4
CO3	Calculate Reaction Rate Kinetics.	K5
CO4	Calculate the Velocity Constant of the Reaction	K3

LIST OF EXPERIMENTS

1. To Determine the Relative and Absolute **Viscosity** of a Given Liquid at Room Temperature by Using the **"Ostwald Viscometer"** Method.
2. To Determine the **Surface Tension of** a Given Liquid at Room Temperature Using a **"Stalagmometer"** by Drop Number Method.
3. To Determine the Kinetics of Dissolution of Magnesium Metal (Ribbon) in Dil. Hcl.
4. To Determine the Strength in gm/lit. of the Given NaOH Solution with the Help of the Standard Oxalic Acid Solution.
5. To Determine the Kinetics of the Decomposition of **Sodium Thiosulphate** ($Na_2S_2O_3$) by Mineral Acid.

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