

B.Sc. III SEMESTER			
Part-A: Introduction			
Program: Diploma Course		Session- 2023-24	
1.	Course Code	CHSC-3 T	
2.	Course Title	Concept of Chemistry- 1	
3.	Course Type	Discipline Specific Course	
4.	Pre-requisite (if any)	To study this course our students must have had the subject chemistry in Certificate Course	
5.	Course Learning Outcome(CLO)	At the end of this course, the students will be able to learn the following aspects of chemistry	
		<ul style="list-style-type: none"> Understand general characteristics of transition elements, lanthanides and actinides 	
		<ul style="list-style-type: none"> Basic concepts of First law of thermodynamics 	
		<ul style="list-style-type: none"> Basic concept of Second law of Thermodynamics 	
		<ul style="list-style-type: none"> Basic concept of Alcohols & Phenols 	
6.	Credit Value	3T	
7.	Total Marks	Max. Marks:	100 (80+ 20 Internal)

Part-B: Content of Course		
Total No. Of Lectures:		
Unit	Topic	No. Of Hours
1	INORGANIC CHEMISTRY A. Chemistry of elements of first second & third transition series transition series- General characteristics, comparative treatment with their 3d analogues in respect of electronic configuration ionic radii, oxidation states, magnetic behaviour, spectral properties and stereochemistry B. Chemistry of Lanthanide & Actinides: Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds. General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from uranium, similarities between the later actinides and the later lanthanides.	10
2	PHYSICAL CHEMISTRY (A)Thermodynamics-I Definition of thermodynamic terms, system, surroundings etc. Types of systems, intensive and extensive properties, State and path functions Thermodynamic operations internal energy, enthalpy, heat capacity of gases at constant volume and at constant pressure and their relationship. First Law of Thermodynamics: Statement, definition of internal energy and enthalpy, Heat capacities at constant volume and pressure and their relationship Joule's law, Joule-Thomson coefficient and inversion temperature, Calculation of w, q, dU & dH for the liquification expansion of ideal gases under isothermal and	12

	adiabatic conditions. (B)Thermochemistry: standard state, Hess's law of heat summation Enthalpy at constant pressure and constant volume. Enthalpy of neutralization, enthalpy of combustion, enthalpy of formation ,calculation of bond enthalpy Kirchhoff's equation.	
3	Thermodynamics-II Second law of Thermodynamics : Spontaneous process need of second law, statements of Carnot cycle , efficiency of heat engine, Carnot theorem, Thermodynamic state of temperature. Concept of entropy: entropy change in a reversible and irreversible process, entropy change in isothermal reversible expansion of an ideal gas. Entropy change isothermal mixing of ideal gases, physical signification of entropy.(D).Gibb& Helmholtz energy variation of G & A with P,V and T Gibbs –Helmholtz equation Claussius claperon equation and conditions of spontaneity A& G as Criterion for thermodynamic equilibrium.	12
4	ORGANIC CHEMISTRY (A) Alcohols (a)Monohydric-nomenclature, methods of formation, Properties & chemical reactions distinction between primary, secondary & tertiary alcohols (b)Dihydric & Trihydric alcohols- nomenclature and methods of formation and chemical reactions (B) Phenols Nomenclature and methods of formation, physical properties and acidic character. Comparative acidic strength of alcohols and phenols. Dihydric & Trihydric Phenols, Mechanism of Fries rearrangement, Kolbe reaction, Claisen rearrangement, Gatterman synthesis, Hauben-Hoesch reaction, Laderer Manasse reaction and Reimer-Tiemann reaction.	11

REFERENCE BOOKS:

1. Basic inorganic chemistry; F.A. Cotton, G. Wilkinson and P. I. Gaus, J.wiley.
2. Concise inorganic chemistry; J. D. Lee, ELBS. .
3. Advance Inorganic Chemistry; Satya Prakash.
4. Advance Inorganic Chemistry ;Puri & Sharma , S. Naginchand.
5. Inorganic Chemistry ; Madan, S.Chand.
6. Selected Topics in Inorganic Chemistry ; Madan Malik &Tuli ,S. Chand
7. Organic Chemistry ; Morrison and Boyd, Prentice Hall.
8. Organic Chemistry ; F.A. Carey McGraw Hill.
9. Organic Chemistry ;P.L.Soni
10. Organic Chemistry; Bahal& Bahal.
11. Organic Chemistry : I.L. Finar Vol.I&II
12. The Element of Physical Chemistry; P. W. Atkin, Oxford
13. Physical Chemistry B.D. Khosla.
14. Physical Chemistry ; Puri &Sharma.
15. Bhautik Rasayan ; P. L. Soni.
16. Bhautik Rasayan; Bahal & Tuli.
17. Bautik Rasayan;Puri &Sharma
18. Vogel's Text Book of Quantitative Inorganic Analysis; revised,ELBS.
19. Vogel's Qualitative Analysis ,revised; Longman.

E-learning Resources:

Fundamental Chemistry related topics on SWAYAM platform and E-pathshala

	Part - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods :			
Maximum Marks :		100 Marks	
Continuous Comprehensive Evaluation(CCE) :		20 Marks	
Semester End Examination(SEE) :		80 Marks	
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Two Internal Test of 10 Marks each Assignment/Seminar –01 of 10 Marks		Total of maximum obtained marks in test exam and Assignment
Semester End Exam (SEE):	Paper – Two section – A & B Section A: Objective & Short answer type questions – 1 x10 + 3 x 10 = 40 Marks Section B: Descriptive answer type questions unit wise – 10 x 04 = 40 Total Marks-80		

Chairman and Members of B.O.S.-