

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)

DEPARTMENT OF CHEMISTRY

COURSE CURRICULUM

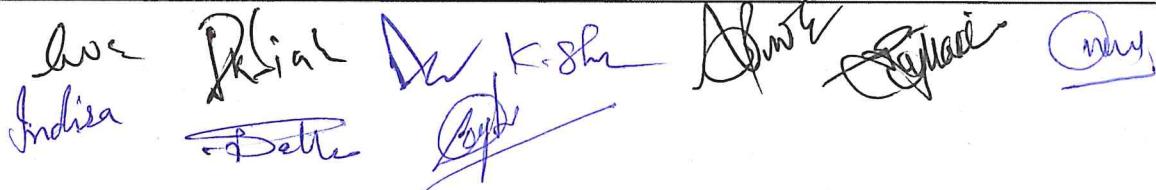
PART-A: Introduction

Program: Bachelor in Science (Diploma / Degree/Honors)		Semester - III	Session: 2024-2025
1	CourseCode	CHSC-03P	
2	CourseTitle	CHEMISTRY LAB. COURSE-III	
3	CourseType	DSC	
4	Pre-requisite(if,any)	-	
5	Course Learning. Outcomes(CLO)	<ul style="list-style-type: none"> ➤ Understand the principle of determining transition temperature of hydrated or other allotropic salts. ➤ Employ the principle of determination of solubility of a given salt at different temperatures. ➤ Apply Born-Haber cycle to determine enthalpy and lattice energy. ➤ Determine strength of an acid, ionization constant of weak acid and solubility product by conductometric or potentiometric titrations. 	
6	CreditValue	1 Credits	Credit =30 Hours Laboratory or Field learning/Training
7	TotalMarks	Max.Marks:50	Min Passing Marks:20

PART -B: Content of the Course

Total No. of learning-Training/performance Periods:30 Periods (30 Hours)

Module	Topics(Course contents)	No. of Period
Lab./Field Training/Experiment Contents of Course	<p>Transition Temperature</p> <p>1) Transition temperature of a salt hydrate – determination of molecular weight.</p> <p>2) Determination of the transition temperature of the given substance by thermometric/dialometric method (e.g. SrBr₂.2H₂O or MnCl₂.4H₂O).</p> <p>Thermochemistry</p> <p>A. Determination of solubility:</p> <p>1) To determine the solubility of benzoic acid at different temperatures and to determine ΔH of the dissolution processes.</p> <p>B. Calorimetry:</p> <p>1) To determine the enthalpy of neutralization of hydrochloric acid (strong acid) by sodium hydroxide (strong base) solution.</p> <p>2)</p> <p>(a) To determine the enthalpy of neutralization of a weak acid (acetic acid) versus strong base (sodium hydroxide) and determine enthalpy of ionization of weak acid.</p> <p>(b) To determine the enthalpy of neutralization of a weak base (ammonium hydroxide) versus strong acid (hydrochloric acid) and determine enthalpy of ionization of weak base.</p> <p>3) To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy.</p> <p>Conductometry</p> <p>1) Conductometry – Determination of limiting molar conductance of a strong Electrolyte (KCl).</p> <p>2) To determine the strength of the given acid (HCl or CH₃COOH)conductometrically</p>	30



	<p>using standard alkali (NaOH) solution.</p> <p>3) To determine the strength of strong acid and a weak acid in the given mixture conductometrically against a standard alkali solution.</p> <p>4) To determine the ionization constant of weak acid conductometrically.</p> <p>Solubility Product</p> <p>1) To determine the solubility and solubility product of a sparingly soluble salt conductometrically.</p> <p>2) Potentiometry – Determination of solubility product of a sparingly soluble substance.</p>	
Keywords	<p><i>Solution, Acid, Alkali. Transition temperature, Thermochemistry, Temperature, Enthalpy, Conductometric titrations, Potentiometric titrations, Solubility product.</i></p>	

Signature of Convener & Members (CBoS) :

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

1. *Vishwanathan, B. & Raghavan, P. S. (2017). Practical Physical Chemistry. Viva books originals publishing.*
2. *Yadav, J. B. (2006). Advanced Practical Physical Chemistry. Krishna Prakashan Media.*
3. *Sahu, D. P. & Bapat, K. N. (2022) Unified practical chemistry, Navbodh Prakashan.*

Reference Books recommended:

1. *Moudgil, H. K. (2010). Textbook of physical chemistry. PHI Learning Pvt. Ltd.*
2. *Adamson, A. (2012). A textbook of physical chemistry. Elsevier.*
3. *Findlay, A. (1923). Practical physical chemistry. Longmans, Green.*

Online Resources –

- e-Resources / e-books and e-learning portals
- <https://tech.chemistrydocs.com/Books/Physical/Advanced-Physical-Chemistry-Experiments-by-J-N-Gurtu-&-Amit-Gurtu.pdf>
- <https://byjus.com/chemistry/conductometric-titration/>
- [https://chem.libretexts.org/Courses/University%20of%20California%20Davis/Chem%204B%20Lab%3A%20General%20Chemistry%20for%20Majors%20II/1%3A%20Thermochemistry%20\(Experiment\)](https://chem.libretexts.org/Courses/University%20of%20California%20Davis/Chem%204B%20Lab%3A%20General%20Chemistry%20for%20Majors%20II/1%3A%20Thermochemistry%20(Experiment))
- https://www.ulm.edu/chemistry/courses/manuals/chem1010/experiment_10.pdf

Online Resources –

- e-Resources / e-books and e-learning portals

PART -D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment G. Performed the Task based on lab. work - 20 Marks H. Spotting based on tools & technology (written) - 10 Marks I. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS: