UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN CHEMISTRY

SYLLABUS WITH EFFECT FROM 2023-2024

<table>
<tr><td>Title of the Course</td><td colspan="7">PHYSICAL CHEMISTRY PRACTICALS</td></tr>
<tr><td>Paper No.</td><td colspan="7">Core VIII(CC8)</td></tr>
<tr><td rowspan="2">Category</td><td rowspan="2">Core</td><td>Year</td><td>II</td><td rowspan="2">Credits</td><td rowspan="2">5</td><td>Course Code</td><td>224C41</td></tr>
<tr><td>Semester</td><td>IV</td></tr>
<tr><td>Instructional hours per week</td><td>Lecture</td><td>Tutorial</td><td colspan="3">Lab Practice</td><td colspan="2">Total</td></tr>
<tr><td>-</td><td>-</td><td colspan="3">5</td><td colspan="2">5</td></tr>
<tr><td>Prerequisites</td><td colspan="7">General Chemistry</td></tr>
<tr><td>Objectives of the course</td><td colspan="7">The course aims at providing an understanding of
• the laboratory experiments in order to understand the concepts of physical changes in chemistry
• the rates of chemical reactions
• colligative properties and adsorption isotherm</td></tr>
<tr><td>Course Outline</td><td colspan="7">Kinetics
1. Determination of rate constant of acid catalyzed hydrolysis of an ester (Methyl acetate).
2.Polarimetry: Determination of rate constant of acid catalyzed inversion of cane sugar (not for the examination)</td></tr>
<tr><td></td><td colspan="7">Chemical equlibrium
3. Partition coefficient and equilibrium constant of $KI + I_2$----KI_3
Thermodynamics
1. Transition temperature
2. CST phenol-water system
Electrochemistry
1. Determination of cell constant and molar conductance of a strong electrolyte
2. Determination of strength of HCl by conductometric Titration
Colorimetry
3. Determination of concentration of copper sulphate (not for the examination)
Colligative property
9. Determination of molecular weight of an organic compound by Rast method using naphthalene or diphenyl as solvent</td></tr>
<tr><td></td><td colspan="7"></td></tr>
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Skills acquired from this course	Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.
Reference Books	1. Sindhu, P.S. Practicals in Physical Chemistry, Macmillan India : New Delhi,2005. 2. Khosla, B. D. Garg,V. C.; Gulati, A.; Senior Practical Physical Chemistry, R. Chand : New Delhi,2011. 3. Gupta, Renu, Practical Physical Chemistry, 1st Ed.; New Age International: New Delhi,2017.
Website and e-learning source	https://www.vlab.co.in/broad-area-chemical-sciences

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: describe the principles and methodology for the practical work

CO2: explain the procedure, data and methodology for the practical work.

CO3: apply the principles of electrochemistry, kinetics for carrying out the practical work.

CO4: demonstrate laboratory skills for safe handling of the equipment and chemicals

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	S	S	M	S	M
CO2	M	S	S	S	M	S	S	M	M	M
CO3	S	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	S	S	S	M	M	M

CO-PO Mapping (Course Articulation Matrix)

CO /PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

Level of Correlation between PSO's and CO's