

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
III	24UCHVAC1	Value Added Course-I	30	-	-	100	100
Course Title		LABORATORY REAGENTS PREPARATION					

SYLLABUS		
Unit	Contents	Hours
I	<b>Concentration of Solutions and their related terms:</b> Standard solution. Concentration terms – Normality, Molarity, Molality, Formality, Mole fraction and Parts Per Million.	6
II	<b>Equivalent Weight</b> Calculation of equivalent weight of HCl, H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> , FAS, FeSO <sub>4</sub> , K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> , H <sub>3</sub> PO <sub>3</sub> , H <sub>3</sub> PO <sub>4</sub> , CaCO <sub>3</sub> , NaOH, KOH, Ca(OH) <sub>2</sub> , Al(OH) <sub>3</sub> , KCl, AlCl <sub>3</sub> and KMnO <sub>4</sub> (Acid, Base and neutral solution).	6
III	<b>Preparation of Different Concentration Solutions - Practical</b> Preparation of N, N/2, N/5 and N/10 solution of HCl, H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> , NaOH, KCl, KMnO <sub>4</sub> , AlCl <sub>3</sub> and K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> in 100, 250, 500 and 1000 mL.	6
IV	<b>Preparation of Parts Per Million Solutions - Practical</b> Preparation of 1, 10, 100, 250, 500 and 1000 ppm solution of CaCO <sub>3</sub> and NaCl for different volumes (Ex. 100, 250 and 500 mL).	6
V	<b>Dilution Factor and Stock solution - Practical</b> Conversion of molar solution to normal solution and normal solution to molar solution. <b>Stock solution</b> – Preparation of 1N of HCl and 1N of H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> for 50, 100, 250 and 500 mL from the stock.	6
<b>Text Book(s):</b>		
1. B.S. Furniss, A.J. Hannaford, P.W.G. Smith, A.R. Tatchell, Vogel's Text Book of Practical Organic Chemistry, 5 <sup>th</sup> Edition, Pearson Publications, India, 2019.		
2. R. Gopalan and K.S. Viswanathan, Analytical Methods, Universities Press, India, 2018.		
<b>Reference Book(s):</b>		
1. R.C. Mukerjee, Modern Approach to Chemical Calculations, Paperback Edition, Bharathi Bhawan Publishers, India, 2021.		
<b>Web Resource(s):</b>		
1. <a href="https://en.wikipedia.org/wiki/Qualitative_inorganic_analysis">https://en.wikipedia.org/wiki/Qualitative_inorganic_analysis</a>		
2. <a href="https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Introductory_Chemistry/13%3A_Solutions/13.07%3A">https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Introductory_Chemistry/13%3A_Solutions/13.07%3A</a>		

**Course Coordinator(s):**

Dr. M. Yaseen Mowlana, Dr. S. Farook Basha, Dr. G. Hema Sindhuja

Semester	Course Code	Course Category	Hours/ Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
V	24UCHVAC2	Value Added Course-II	30	-	-	100	100
Course Title		<b>THIN LAYER CHROMATOGRAPHY AND PHYSICAL CONSTANTS DETERMINATION</b>					

SYLLABUS		
Unit	Contents	Hours
I	<b>Thin Layer Chromatography</b> 1.1 Thin Layer Chromatography-Principle, techniques, preparation of chromatoplates, application of sample on the chromatoplates. 1.2 Choice of adsorbents, selection of solvents, locating reagents, developing chamber, development types, location of compounds. 1.3 R <sub>f</sub> value, factors affecting R <sub>f</sub> value, detection, identification and estimation.	6
II	<b>Determination of Physical Constants</b> 2.1. Melting point- Definition, determination by Thiele and Gallenkump melting point apparatus. 2.2. Boiling point – Definition and determination	6
III	<b>Thin Layer Chromatography- Practical-I</b> 3.1 Preparation of TLC plates 3.2 Separation of pigments from a mixture of red ink, blue ink and black ink.	6
IV	<b>Thin Layer Chromatography- Practical-II</b> 4.1 Separation of mixture of amino acids 4.2 Separation of mixture of phenols	6
V	<b>Determination of Physical Constants - Practical</b> 5.1 Determination of melting point of the following solids i) Benzoic acid ii) Benzamide iii) Naphthalene 5.2. Determination of boiling point of the following liquids: i) Ethyl acetate ii) Water iii) Ethyl Methyl Ketone	6
<b>Text Book(s):</b>		
1. B. K. Sharma, Instrumental Method of Chemical Analysis, First Paper Print Edition, Krishna Prakashan Media (P), Ltd, Meerut, Uttar Pradesh, 2023. 2. V. K. Srivastava and K. K. Srivastava, Introduction to Chromatography- Theory and Practice, 4 <sup>th</sup> Edition, S. Chand and Company (Pvt) Ltd., New Delhi-110 002, 2020.		
<b>Reference Book:</b>		
1. H. Kaur, Instrumental Methods of Chemical Analysis, 12 <sup>th</sup> Edition, Pragati Prakashan, Meerut, Uttar Pradesh, 2022.		
<b>Web Resource(s):</b>		
1. <a href="https://archive.nptel.ac.in/content/storage2/courses/102103047/PDF/mod4.pdf">https://archive.nptel.ac.in/content/storage2/courses/102103047/PDF/mod4.pdf</a> 2. <a href="https://www.youtube.com/watch?v=74vCYTIHo5Q">https://www.youtube.com/watch?v=74vCYTIHo5Q</a>		

Course Coordinator(s): Dr. K. Loganathan, Dr. M. Anwar Sathiq, Dr. R. Arulnagai

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					CIA	ESE	Total
III	24PCHVAC1	Value Added Course	30	-	-	100	100
Course Title		<b>CHROMATOGRAPHY AND PHYTOCHEMICAL ANALYSIS</b>					

SYLLABUS		
UNIT	CONTENTS	HOURS
I	<b>Paper chromatography-</b> Definition-principle-Instrumentation- Techniques - Applications.	6
II	<b>Gas chromatography-</b> Principle- Instrumentation- Techniques - Applications.	6
III	<b>Extraction Techniques- Practical</b> General methods of extraction –Percolation and Soxhlet extraction.	6
IV	<b>High performance liquid chromatography (HPLC) - Practical</b> Principle, Instrumentation, Techniques, Identification of chemical components of Neem plant extract.	6
V	<b>Phytochemical Analysis - Practical</b> Identification of alkaloids-Mayer's test, terpenoids-Salkowski test, flavonoids -lead acetate test, protein-Ninhydrin test, saponins-capillary test, tannins-Frothing test, glycosides-Keller-Killiani test and carbohydrates-Molisch's test.	6

<b>Text Book(s):</b>
1. Dhruva Charan Dash, Analytical Chemistry, PHI Learning Pvt Ltd, 2 <sup>nd</sup> Edition, 2017.
2. Gurdeep R Chatwal, Organic chemistry of Natural products, Volume I&II, Himalaya Publishing House, 5 <sup>th</sup> Edition, 2019.
<b>Reference Book(s):</b>
1. E. Hywel Evans and Mike E.S, Analytical Chemistry a Practical Approach, Oxford University Press, 1 <sup>st</sup> Edition, 2019.
2. Jeffrey B. Harborne Phytochemical methods: A Guide to Modern Techniques of Plant Analysis, Indian Reprint, Springer, 5 <sup>th</sup> Edition, 2013.
<b>Web Resources:</b>
1. <a href="https://www.youtube.com/watch?v=EvkZxx5if84">https://www.youtube.com/watch?v=EvkZxx5if84</a>

**Course Coordinator(s):**

**Dr. A. Zahir Hussain, Dr. H. Mohamed Kasim Sheit, Dr. A. Samsath Begum**