

BS Chemistry Semester-II					
Programme	BS Chemistry	Course Code	Chem - 132	Credit Hour	1
Course Title	Organic Chemistry Lab		Course Type	Major	
Course Introduction					
<p>The course is organized to provide an adequate knowledge about basic experimental techniques in organic chemistry including chemistry of different functional groups.  Here is a brief description of course outlines:  Organic lab safety and basic lab apparatus and equipment introduction  Basic Experimental techniques used in organic chemistry  Filtration  Simple and fractional distillation  Solvent extraction  Sublimation  Re-crystallization  Compound Analysis  Identification of functional groups in different organic compounds containing only one functional group with special emphasis on compounds containing following functional groups.  -COOH, -OH, C=O, -NH<sub>2</sub>, and -CONH<sub>2</sub>  Estimations (volumetric)  Determination of molecular weight of a carboxylic acid.</p>					
Learning Outcomes					
<p>On the completion of the course, the students will:</p> <ol style="list-style-type: none"> <li>1. Learn about the basic purification techniques in organic chemistry</li> <li>2. will be able to detect the functional groups in different organic compounds</li> <li>3. will be able to understand the principles of basic lab safety</li> </ol>					
Course Content				Assignments/Readings	
<b>Week 1</b>	Basic experimental techniques used in organic chemistry Filtration Separation of given mixture of glucose and sand by filtration			Enlist all separation techniques and merits and demerits of these technique	
<b>Week 2</b>	Distillation Separation of given miscible mixture of water and ethanol by fractional distillation				
<b>Week 3</b>	Solvent Extraction Extraction of caffeine from tea or coffee			Search out different sub techniques used in solvent extraction.	
<b>Week 4</b>	Sublimation Separate the mixture of benzoic acid and sand				
<b>Week 5</b>	Re-crystallization Purify the given impure sample of benzoic acid				
<b>Week 6</b>	Chromatography Separate the given mixture of benzoic acid and acetanilide by using thin layer chromatography			Enlist types of chromatography.	
<b>Week 7</b>	Column Chromatography Basic concept of column chromatography and demonstration of experimental set-up				

	Separate the mixture of benzoic acid and methyl benzoate from an alumina column.	
<b>Week 8</b>	<b>Mid Term Examinations</b>	
<b>Week 9</b>	Compound Analysis Lecture on functional groups in organic chemistry, preliminary tests, solubility tests and group detection test Melting and boiling point determination	Write down chemistry of all reactions
<b>Week 10</b>	Carboxylic acid Identify the functional groups present in the given sample of oxalic acid	
<b>Week 11</b>	Phenol (water soluble) Identification of resorcinol by functional group detection tests	
<b>Week 12</b>	Phenol (water insoluble) Identification of $\alpha$ -naphthol by functional group detection tests	
<b>Week 13</b>	Carbonyl compounds (Aldehydes and ketones) Identify the given sample of glucose	
<b>Week 14</b>	Amide Group Identify the pure sample of urea	
<b>Week 15</b>	Estimations (volumetric) Determine the molecular weight of given carboxylic acid	Practice problems
<b>Week 16</b>	<b>Final Term Examinations</b>	
<b>Textbooks and Reading Material</b>		
<ol style="list-style-type: none"> <li>1. K.N. Williamson and K.M. Masters, <i>Macroscale and Microscale Organic Experiments</i>, published by Cengage learning, 2011.</li> <li>2. Practical Organic Chemistry by F.G. Mann and B.C. Saunders, Longman, UK, 1978.</li> <li>The Systematic Identification of Organic Compounds (8<sup>th</sup> Ed.) by R.L. Shriner et al., Wiley, 2003.</li> <li>Vogel's Textbook of Practical Organic Chemistry (5<sup>th</sup> Ed.) by A.I. Vogel et al. Longman, UK, 1989.</li> <li>Advanced Practical Organic Chemistry, by J. Leonard, B. Lygo, G. Procter, CRC, 1994.</li> <li>Advanced Practical Organic Chemistry (2<sup>nd</sup> Ed.) by N.K. Vishnoi, Vikas Publishing House Pvt. Ltd. India, 1996.</li> <li>J.J. Li, C. Limberakis and D.A. Pflum, <i>Modern Organic Synthesis in Laboratory</i>, Oxford University Press, 2007.</li> <li>J. Leonard, B. Lygo and G. Procter Nelson, <i>Advanced Practical Organic Chemistry</i>, Thomas Ltd. UK, 2001.</li> </ol>		
<b>Teaching Learning Strategies</b>		
<ol style="list-style-type: none"> <li>1. Quizzes</li> <li>2. Lectures</li> <li>3. Assignments</li> <li>4. Group Discussion</li> </ol>		

### Assignments: Types and Number with Calendar

1. Lab activities and practical performance from week 1 to week 16.
2. Literature review based assignment relevant to the course will also be given during the course.
3. Maintain record of all Practicals in note book under the following headings:  
Theory, Procedure, Chemicals, Observations and Results, Precautions

### Assessment

Sr. No.	Elements	Weightage	Details
1	Midterm Assessment	35%	Viva, Written and practical assessment at the mid-point of the semester.
2	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, viva voce, attitude and behavior, hands-on-activities, projects, practical, reflections, readings, quizzes etc.
3	Final Assessment	40%	Viva, Practical performance and written examination at the end of the semester.