

BS Chemistry Semester-V					
Programme	BS Chemistry	Course Code	CHEM-392	Credit Hours	1
Course Title	Green Solvents (Lab)		Course Type	Major Elective	
Course Introduction					
This course is aimed to make students learn the practical applications of green solvents essential for any of the chemical reaction to make it environmentally benign. It explores the principles, applications and environmental impacts of green solvents in chemical processes. Synthesis of green solvents, Solvent evaluation traditional vs green solvents, applications of green solvents in chemical processes, organic reactions using green solvents					
Learning Outcomes					
On the completion of the course, the students will be able to: 1. Understand the principles of green chemistry and solvent selection 2. Explore various types of green solvents and their applications 3. Evaluate the environment and economic impact of traditional vs green solvents 4. Explore the applications of green solvents in various lab scale processes					
Course Content			Assignments/Readings		
Week 1	Tools and techniques for green solvent selection		Related reading		
Week 2	Using water as solvent for organic reaction (oxidation/reduction/Diels-Alder reaction /any suitable reaction)		Related reading		
Week 3	Using water as solvent for organic reaction (oxidation/reduction/Diels-Alder reaction /any suitable reaction)		Related reading		
Week 4	Using water as solvent for organic reaction (oxidation/reduction/Diels-Alder reaction /any suitable reaction)		Related reading		
Week 5	Synthesis of acidic ionic liquid		Related reading		
Week 6	Synthesis of basic ionic liquid		Related reading		
Week 7	Synthesis of room temperature ionic liquid		Related reading		
Week 8	Mid-term Examination				
Week 9	Synthesis of deep eutectic solvents		Related reading		
Week 10	Synthesis of deep eutectic solvents		Related reading		
Week 11	Organic synthesis using ionic liquids (Wittig reaction/Friedel Crafts/Diels-Alder/reduction reaction)		Related reading		
Week 12	Organic synthesis using ionic liquids (Wittig reaction/Friedel Crafts/Diels-Alder/reduction reaction)		Related reading		
Week 13	Organic synthesis using ionic liquids (Wittig reaction/Friedel Crafts/Diels-Alder/reduction reaction)		Related reading		
Week 14	Organic synthesis using ionic liquids (Wittig reaction/Friedel Crafts/Diels-Alder/reduction reaction)		Related reading		
Week 15	Dissolution of cellulose using ionic liquids		Related reading		
Week 16	Final term Examination				

Textbooks and Reading Material	
1. J. H. Clark, A. Hunt, C. Topi, G. Paggiola and J. Sherwood, (2017), <i>Sustainable Solvents: Perspectives from Research, Business and International Policy (Green Chemistry Series)</i>, RSC Publishers. 2. A. Lapkin and D. Constable, (2008), <i>Green Chemistry Metrics: Measuring and Monitoring Sustainable Processes</i>, Wiley Publishers. 3. Douglas, R. Macfarlane, Mega Kar, and Jennifer M. Pringle, (2017), <i>Fundamentals of Ionic Liquids, from Chemistry to Applications</i>, Wiley VCH publishers. 4. Micheal Freementle, (2010), <i>An Introduction to Ionic Liquids</i>, RSC Publishers. 5. Jason P. Hallett. (2010), <i>An Introduction to Ionic Liquids</i>, RSC Publishers. 6. Suojia Zhang, Xinmei Lu, Sucai Li. (2009), <i>Ionic Liquids: Physicochemical Properties</i>, Elsevier Publishers 7. P. Anastas and P. Trevorow, (2013), <i>Handbook of Green Chemistry, Green Processes, Designing Safer Chemicals</i>, Wiley Publishers	
Teaching Learning Strategies	
Class lecture method, which includes seminars, discussions, assignments and projects. Audio-visual tools will be used where necessary	
Assignments: Types and Number with Calendar	
1. Written Task 2. Presentation 3. Tutorials 4. Solving related exercises	