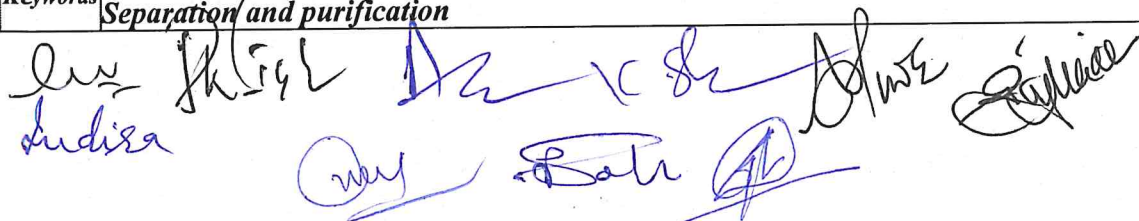


FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF INDUSTRIAL CHEMISTRY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Honors/Honors with Research)		Semester - VIII	Session: 2024-2025
1	CourseCode	ICSC-08T	
2	CourseTitle	PETROCHEMICALS AND POLYMERS	
3	CourseType	DSC	
4	Pre-requisite(if,any)	<i>As per program</i>	
5	Course Learning Outcomes(CLO)	<ul style="list-style-type: none"> ➤ Demonstrate knowledge of production methods for specific hydrocarbon derivatives, as well as aromatic hydrocarbons. ➤ Apply the concept of synthesis gas production to understand the generation of key petrochemicals ➤ Describe the manufacturing processes for important polymers ➤ Explain the manufacturing processes for various synthesis resins used in different applications 	
6	CreditValue	3 Credits	Credit = 15 Hours -learning & Observation
7	TotalMarks	Max.Marks: 100	Min Passing Marks:40
PART -B: Content of the Course			
TotalNo.of Teaching-learning Periods(01 Hr. per period) - 45 Periods (45 Hours)			
Unit	Topics(Coursecontents)		No.ofP eriod
I	Production of Specific Hydrocarbon Derivatives with special emphasis on: - C1 Compound. - C2 Compound. - C3 Compound. - C4 Compound. - Aromatic hydrocarbons.		12
II	Production of Petrochemicals:- - Synthesis Gas, Acetylene, Butylene, Isopropanol, Phenol-Acetone, Hydrogen		11
III	Manufacturing of Important Polymers:- - Polyolefin, Vinyl, Acrylies, Polyamides, Polyesters, Polyurethanes, Polycarbonates, Current and Future Industrial Scope in India for Petrochemical and Polymer Industries.		11
IV	Manufacturing of Synthesis Resins:- - Alkyd resins. - Phenolic resins. - Amino resins. - Epoxy resins. - Unsaturated Polyesters. Building Block for Petrochemicals, Their separation and purification, manufacturing process of Aromatic and Napthhenes.		11
Keywords	Hydrocarbons, Petrochemicals, Polymers, Resins, Manufacturing Process, Separation and purification		



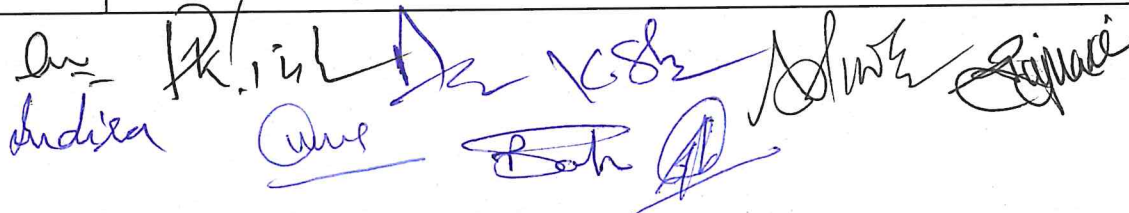
Signature of Convener & Members (CBoS):

PART-C: Learning Resources		
Text Books, Reference Books and Others		
<i>Text Books Recommended –</i>		
<ol style="list-style-type: none"> 1. Jain, S. K. (2013). <i>Chemical Kinetics</i>. Vishal Publication. 2. Sharma, B. K. (2019). <i>Industrial Analysis</i>. Gael Publication. 3. Sharma, B. K. (2010). <i>Hydrocarbons and petrochemicals (2nd ed.)</i>. Khanna Publishers. 4. Chakraborti, A. K. (2017). <i>Polymer science</i>. New Age International Publishers. 5. Srivastava, P. C. (2008). <i>Resins: Chemistry, applications and technology</i>. Studium Press. 		
<i>Reference Books Recommended –</i>		
<ol style="list-style-type: none"> 1. Perry, R. H. (Editor). (2018). <i>Perry's chemical engineers' handbook (9th ed.)</i>. McGraw-Hill Education. (This is a classic reference by an international author, but highly relevant for the given topics) 2. Sharma, B. K. (2017). <i>Industrial chemistry (2nd ed.)</i>. Khanna Publishers. (This book by an Indian author covers a broad range of industrial processes, including those relevant to your query) 3. Bhagat, S. D. (2012). <i>A handbook of separation processes and techniques (2nd ed.)</i>. Academic Press. 6. Smith, J. M. (1981). <i>Chemical engineering kinetics</i>. McGraw Hill Book Co. 4. Parsania, P. H. (2006). <i>Physico-chemical exercise</i>. 		
Online Resources–		
<ul style="list-style-type: none"> ➤ https://www.sciencedirect.com/topics/chemistry/hydrocarbon-derivatives ➤ https://www.chemguide.co.uk/organicprops/aromaticity/derivatives.html ➤ https://www.eolss.net/Sample-Chapters/C12/E6-76-02-01.pdf ➤ https://www.sciencedirect.com/topics/engineering/petrochemical-production ➤ https://www.chemeurope.com/en/encyclopedia/Petrochemicals.html ➤ https://www.sciencedirect.com/topics/chemistry/polymer-manufacturing ➤ https://www.researchgate.net/publication/337797150_Indian_Petrochemical_and_Polymer_Industry_An_Overview ➤ https://www.sciencedirect.com/topics/materials-science/alkyd-resin 		
Online Resources–		
➤ e-Resources / e-books and e-learning portals		
PART-D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100 Marks		
Continuous Internal Assessment (CIA): 30 Marks		
End Semester Exam (ESE): 70 Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment/Seminar- 10 Total Marks -30	Better marks out of the two Test / Quiz+ obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit- 4x10=40Marks	

Name and Signature of Convener & Members of CBoS:

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF INDUSTRIAL CHEMISTRY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Honors/Honors with Research)		Semester - VIII	Session: 2024-2025
1	CourseCode	ICSC-08P	
2	CourseTitle	INDUSTRIAL CHEM. LAB. COURSE-VIII	
3	CourseType	DSC	
4	Pre-requisite(if,any)	As per program	
5	Course Learning Outcomes(CLO)	<ul style="list-style-type: none"> ➤ To understand concept of crystalline and amorphous state of polymers. ➤ To correlate flexibility with the glass transition temperature. ➤ To understand structure-property relationship of polymers. ➤ To apply mathematical formulae to depict polymer solution properties ➤ To apply the knowledge of latex manufacturing and compounding. ➤ To apply the knowledge of techniques used in monomer production 	
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			
TotalNo.of learning-Training/performancePeriods:30 Periods (30 Hours)			
Module	Topics(Course contents)		No.ofP eriod
Lab./Field Training/ Experiment Contents of Course	<ol style="list-style-type: none"> 1. Chemical identification of polymers- • Unsaturation • Testing of functional groups (associated with polymers). 2. To determine the melting point of crystalline polymers. 3. To check the solubility of the given polymeric sample in different solvents. 4. Determination of molecular weight by solution viscosity. 5. Fractional distillation of crude oil. 6. To calculate dry rubber content (DRC) of latex. 7. To determine the coagulation strength of latex. 		30
Keywords	Petrochemicals, Polymers, Functional group, Viscosity, Solution		



Signature of Convener & Members (CBoS):

PART-C: Learning Resources		
Text Books, Reference Books and Others		
Text Books Recommended –		
1. Gowarikar V.R., (2010) <i>Polymer Science</i> , New Age International Publishers Ltd. 2. Shah V., (1998) <i>Handbook of Plastics Testing Technology</i> , Wiley Interscience. 3. Kumar D., Chandra R., (2001) <i>Latex Technology</i> , Dhanpat Rai & Co. 4. Rao B.K.B., (2007) <i>Text book on Petrochemicals</i> , Khanna Publishers.		
Reference Books Recommended –		
1. Brydson J.A., (1999) <i>Plastics Materials</i> , Butterworth Heinemann. 2. Billmeyer F.W., (2007) <i>Textbook of Polymer Science</i> , Wiley, India.		
Online Resources–		
➤ https://www.sciencedirect.com/topics/chemistry/hydrocarbon-derivatives ➤ https://www.chemguide.co.uk/organicprops/aromaticity/derivatives.html ➤ https://www.eolss.net/Sample-Chapters/C12/E6-76-02-01.pdf ➤ https://www.sciencedirect.com/topics/engineering/petrochemical-production ➤ https://www.sciencedirect.com/topics/chemistry/polymer-manufacturing ➤ https://www.sciencedirect.com/topics/materials-science/alkyd-resin		
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 S. Performed the Task based on lab. work - 20 Marks T. Spotting based on tools & technology (written) - 10 Marks U. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

Indira, Anurag, Balraj, Anurag, Anurag, Anurag, Anurag