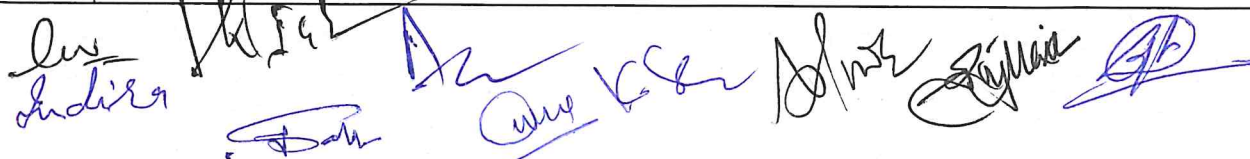


**DEPARTMENT OF INDUSTRIAL CHEMISTRY**  
**COURSE CURRICULUM**

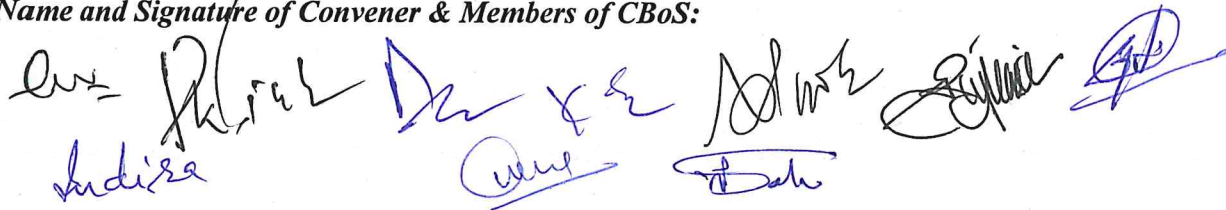
<b>PART-A: Introduction</b>			
Program: Bachelor in Science (Honors/ Honors with Research)		Semester - VIII	Session: 2024-2025
1	Course Code	ICSE-09T	
2	Course Title	TECHNOLOGY OF SELECTED FINISHED PRODUCT – DYES	
3	Course Type	DSE	
4	Pre-requisite(if,any)	As per program	
5	Course Learning Outcomes(CLO)	<ul style="list-style-type: none"> <li>➤ To understand the technology of finished product.</li> <li>➤ To understand the chemical constituent of finished product.</li> <li>➤ To understand the process of making of finished product.</li> <li>➤ To understand the applications of finished products.</li> </ul>	
6	Credit Value	3 Credits	Credit = 15 Hours -learning & Observation
7	Total Marks	Max.Marks: 100	Min Passing Marks:40
<b>PART -B: Content of the Course</b>			
Total No.of Teaching-learning Periods(01 Hr. per period) - 45 Periods (45 Hours)			
Unit	Topics(Course contents)		No.of Period
I	Theory of color & Chemical constitution of dyes based on textile fibers and application Classification of dyes based on method of application and chemical structure. Intermediate compounds:- Introduction, Classification, Synthesis of H-Acid, G-Acid, R-Acid, GamaAcid, 1,2,4-Acid, AAA, Bon-Acid, B-Naphthol.		12
II	Study of following group of dyes:- - Proceine / Reactive dyes. - Napthol dyes. - Indigo & Thio Indigo dyes. - Pigment dyes. - Optical brighteners. - Anthraquinoid dyes. - Azo dyes.		11
III	Study of following group of dyes:- - Nitroso dyes. - Nitro dyes. - Azoic dyes. - DPM dyes. - TPM dyes. - Phthaleins dyes. - Xanthene dyes.		11
IV	Non-textile use of dyes:- - Food dyes. - Medicinal dyes. - Leather dyes. - Indicators. - Paper dyes.		11
<b>Keywords</b> Colour & Dyes, Synthetic & Natural Dyes, Classification, Recent Applications			



**Signature of Convener & Members (CBoS):**

<b>PART-C: Learning Resources</b>		
<b>Text Books, Reference Books and Others</b>		
<b>Text Books Recommended –</b>		
<ol style="list-style-type: none"> <li>1. Agrawal, O. P. (2001). <i>Synthetic dyes</i>.</li> <li>2. Venkataraman, K. (Ed.). (1952). <i>The chemistry of dyes and pigments</i>. Blackie &amp; Son Limited. (Note: Edited work, Venkataraman may not be the sole author)</li> <li>3. Mudgal, S. P. (2015). <i>Fundamentals of dye chemistry</i>. New Age International (Publishers).</li> <li>4. Desai, N. R. (2000). <i>Textile dyes: Classification, chemistry and applications</i>. Universal Publishing Company.</li> </ol>		
<b>Reference Books Recommended –</b>		
<ol style="list-style-type: none"> <li>1. Fierts-Dvid, H. E., &amp; Balangey, L. (1975). <i>Fundamental process of dye chemistry</i>. Inter Science.</li> </ol>		
<b>Online Resources–</b>		
<ul style="list-style-type: none"> <li>➤ <a href="https://www.sciencedirect.com/topics/medicine-and-dentistry/dye">https://www.sciencedirect.com/topics/medicine-and-dentistry/dye</a></li> <li>➤ <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10685195/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10685195/</a></li> <li>➤ <a href="https://en.m.wikipedia.org/?title=Synthetic+dyes&amp;redirect=no">https://en.m.wikipedia.org/?title=Synthetic dyes&amp;redirect=no</a></li> <li>➤ <a href="https://maiwa.com/collections/natural-dyes">https://maiwa.com/collections/natural-dyes</a></li> <li>➤ <a href="https://www.researchgate.net/publication/323960391_Classifications_properties_and_applications_of_textile_dyes_A_review">https://www.researchgate.net/publication/323960391 Classifications properties and applications of textile dyes A review</a></li> <li>➤ <a href="https://www.slideshare.net/slideshow/dyes-and-pigments/79104161">https://www.slideshare.net/slideshow/dyes-and-pigments/79104161</a></li> </ul>		
<b>PART-D: Assessment and Evaluation</b>		
<b>Suggested Continuous Evaluation Methods:</b>		
<b>Maximum Marks: 100 Marks</b>		
<b>Continuous Internal Assessment(CIA):30 Marks</b>		
<b>End Semester Exam(ESE):70 Marks</b>		
<b>Continuous Internal Assessment(CIA): (By Course Teacher)</b>	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
<b>End Semester Exam (ESE):</b>	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**

<b>PART-A: Introduction</b>			
Program: Bachelor in Science (Honors/ Honors with Research)		Semester - VIII	Session: 2024-2025
1	CourseCode	CHSE-09P	
2	CourseTitle	TECHNOLOGY OF SELECTED FINISHED PRODUCT – DYES LAB. COURSE	
3	CourseType	DSE	
4	Pre-requisite(if,any)	As per program	
5	Course Learning Outcomes(CLO)	<ul style="list-style-type: none"> <li>➤ To understand the synthesis and purification of dyes.</li> <li>➤ Understanding characterization and applications of dyes.</li> <li>➤ Employing different analytical methods to purify, characterize and evaluate applications of dyes.</li> <li>➤ To apply spectroscopic methods to characterize and extract dyes.</li> <li>➤ To conduct a visit of dye industry and preparation of report.</li> </ul>	
6	CreditValue	1 Credits	Credit =30 Hours Laboratory or Field learning/Training
7	TotalMarks	Max.Marks:50	Min Passing Marks:20
<b>PART -B: Content of theCourse</b>			
TotalNo.of learning-Training/performancePeriods:30 Periods (30 Hours)			
Module	Topics(Coursecontents)		No.ofP eriod
Lab./Field Training/ Experiment Contents of Course	<ul style="list-style-type: none"> <li>• Synthesis of dyes.</li> <li>• Chromatographic methods for dye purification.</li> <li>• Analytical methods for dye and pigment characterization.</li> <li>• Extraction of dyes by nanomaterials or by other means.</li> <li>• Spectroscopic methods to characterize dyes.</li> <li>• Visit dye industry and prepare report.</li> <li>• Execution of field visit/seminar/report/quiz/project etc.</li> </ul>		<b>30</b>
Keywords	Dye, synthesis, purification, analytical methods, spectroscopic methods, characterization of dyes, industry, nanomaterials.		

### PART-C: Learning Resources

#### Text Books, Reference Books and Others

##### Text Books Recommended –

1. Ajayi, S. B. (2009). *Dyes and dyeing in ancient India*. National Book Trust, India.
2. Chatwal, A., & Anand, S. (2011). *Instrumental methods of chemical analysis (5th ed.)*. Anand Publishers.
3. Mehta, B. K., & Singh, M. (2005). *Analysis of dyes and pigments*. CBS Publishers & Distributors.
4. Pandey, S., & Sharma, H. C. (Eds.). (2014). *Nanomaterials for textiles*. Elsevier.
5. Agarwal, Y. K. (2001). *A course in instrumental analysis*. Krishna Publishers.

##### Reference Books Recommended –

1. Zollinger, H. (2003). *Colour chemistry: Syntheses, properties, and applications of organic dyes and pigments*. Wiley-VCH Verlag GmbH & Co. KGaA.
2. Snyder, L. R., & Kirkland, J. J. (2010). *High-performance liquid chromatography (3rd ed.)*. John Wiley & Sons, Inc.
3. Sherma, J., & Fried, B. (2002). *Modern chromatographic techniques in food analysis*. CRC Press.

##### Online Resources–

- e-Resources / e-books and e-learning portals
- <https://archive.nptel.ac.in/courses/116/104/116104046/>
- <https://nptel.ac.in/courses/116104044>
- [https://onlinecourses.nptel.ac.in/noc22\\_te04/preview](https://onlinecourses.nptel.ac.in/noc22_te04/preview)
- [https://onlinecourses.swayam2.ac.in/cec19\\_te01/preview](https://onlinecourses.swayam2.ac.in/cec19_te01/preview)

##### 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):35Marks

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 Y. Performed the Task based on lab. work - 20 Marks Z. Spotting based on tools& technology (written) – 10 Marks AA. Viva-voce (based on principle/technology) - 05 Marks

Name and Signature of Convener & Members of CBoS: