

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

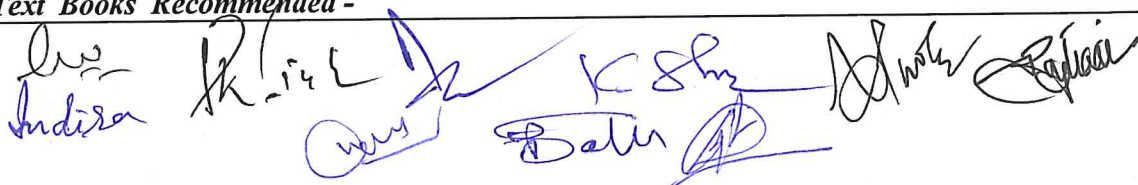
<b>PART- A: Introduction</b>			
Program: Bachelor in Science (Degree/Honors)		Semester - V	Session: 2024-2025
1	Course Code	ICSC-05T	
2	Course Title	INDUSTRIAL ECONOMICS & INSTRUMENTATION	
3	Course Type	DSC	
4	Pre-requisite (if, any)	<i>As per program</i>	
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> <li>➤ To gain knowledge of the process of estimating the costs associated with completing a project within scope and according to its timeline.</li> <li>➤ To determine the real value of assets and to fix the right price for products.</li> <li>➤ To develop the ability to calculate profit and to learn about management skills and become efficient managers.</li> <li>➤ To learn about the instrumental techniques useful in the industrial field.</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	Factors involved in project cost estimation, Methods employed for the estimation of capital investment, Capital formation, Elements of cost accounting, Interest & investment cost, Time value of money equivalence, Depreciation, Method of determining depreciation, Taxes, Some aspects of marketing, Pricing policy	12	
II	Profitability criteria, economics of selecting alternatives, variation of costs with capacity, break-even point, optimum batch sizes, production, scheduling, sampling of bulk materials, techniques of sampling of solids, liquids, and gases, collection & processing data, particle size determination, rheological properties of liquids, plastics, and their analysis & control, location of industry.	11	
III	Industrial Organization, Concept of scientific management in industry, Functions of management: decision making, planning, organizing, directing, Materials management, Inventory control, Management of human resources: selection, incentives, welfare & safety.	11	
IV	Instrumentation, UV-Visible Spectroscopy, IR Spectroscopy (non-dispersive IR), NMR Spectroscopy, Atomic Absorption & Flame Photometry, X-Ray Fluorescence, Ion-Selective Electrodes, Neutron Diffraction	11	
Keywords	Cost pricing, capital formation, industrial organization, UV visible, IR, NMR, X-ray		

*Signature of Convener & Members (CBoS) :*

**PART-C: Learning Resources**

Text Books, Reference Books and Others

Text Books Recommended -



**Text Books Recommended –**

1. Tarachand (2010). *Industrial Organization & Management (Vols. I & II)*. New Delhi, India: Everest Publishing House.
2. Khandelwal, O. P. (2009). *Book on Management*. New Delhi, India: Himalaya Publishing House.
3. Sharma, B. K. (2008). *Instrumental Methods of Analysis*. New Delhi, India: Goel Publishing House.

**Reference Books Recommended –**

1. Bethel, L. L. (1998). *Industrial Organization & Management*. Upper Saddle River, NJ: Prentice Hall.
2. Elrich, R. F. (2017). *Rheology: Theory & application (Vol. 5)*. Amsterdam, Netherlands: Elsevier.
3. Willard, H. H., Merit, L. L., & Dean, J. A. (2015). *Instrumental Methods of Analysis*. New Delhi, India: CBS Publishers.
4. Skoog, D. A., & West, D. M. (2013). *Fundamentals of Analytical Chemistry*. Belmont, CA: Cengage Learning

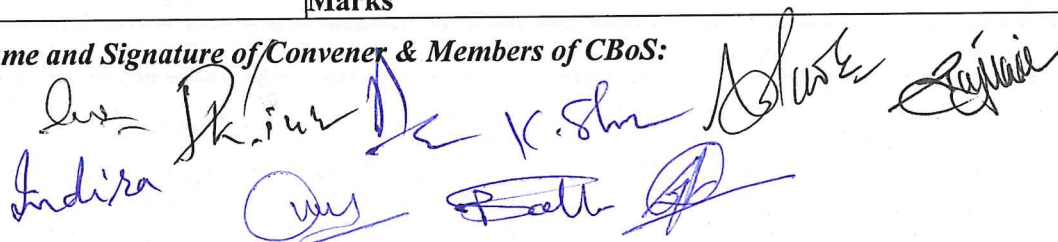
**Online Resources–**

- <https://www.udemy.com/course/industrial-instrumentation-and-control-devices/?couponCode=LEADERSALE24A>
- <https://onlinelibrary.wiley.com/journal/14676451>
- <https://ocw.mit.edu/courses/14-271-industrial-organization-i-fall-2005/>
- [https://business-school.exeter.ac.uk/module/?mod\\_code=BEEM015&ay=2023/4&sys=0](https://business-school.exeter.ac.uk/module/?mod_code=BEEM015&ay=2023/4&sys=0)

**PART -D: Assessment and Evaluation**

<b>Suggested Continuous Evaluation Methods:</b>		
<b>Maximum Marks:</b>	<b>100 Marks</b>	
<b>Continuous Internal Assessment (CIA):</b>	<b>30 Marks</b>	
<b>End Semester Exam (ESE):</b>	<b>70 Marks</b>	
<b>Continuous Internal Assessment (CIA): (By Course Teacher)</b>	Internal Test / Quiz-(2): <b>20</b> / <b>20</b> Assignment / Seminar - <b>10</b> Total Marks - <b>30</b>	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against <b>30</b> Marks
<b>End Semester Exam (ESE):</b>	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4=20 Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks	

Name and Signature of Convener & Members of CBoS:


  
 Indira, K. S. Sharma, A. K. Sharma, Rajni



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<b>PART-A: Introduction</b>			
Program: Bachelor in Science (Degree/Honors)		Semester-V	Session: 2024-2025
1	Course Code	ICSC-05P	
2	Course Title	INDUSTRIAL CHEMISTRY LAB. COURSE- V	
3	Course Type	DSE DSC	
4	Pre-requisite(if, any)	As per program	
5	Course Learning Outcomes(CLO)	<ul style="list-style-type: none"> <li>➤ To learn the synthesis of compound in laboratory.</li> <li>➤ To learn the packaging of products</li> <li>➤ To learn the testing of drug or crude materials.</li> <li>➤ To understand the industrial need of lab.</li> </ul>	
6	Credit Value	1 Credits	Credit =30 Hours Laboratory or Field learning/Training
7	Total Marks	Max.Marks:50	Min Passing Marks:20
<b>PART -B: Content of the Course</b>			
Total No. of learning-Training/performancePeriods:30 Periods (30 Hours)			
Module	Topics(Coursecontents)		No. of Period
Lab./Field Training / Experiment Contents of Course	<ol style="list-style-type: none"> <li>1. Synthesis of common industrial compounds involving two-step reactions:4-bromo aniline,3-Nitroaniline, Sulphanilamide,4-Amino benzoicacid,4-Nitro benzoic acid, di halo benzenes, Nitro halo benzenes.</li> <li>2. Industrial analysis of common raw materials as per industrial specification: Phenol, Aniline, Formaldehyde, Hydrogen peroxide, Acetone, Epoxide, Olefins, oils etc.</li> <li>3. Demonstration of various pharmaceutical packaging materials, quality control tests of some materials,-A1 Strips, Cartons, Glass bottles</li> <li>4. Limit tests for chlorine, heavy metals, arsenic etc. of two representative bulk drug.</li> <li>5. Active ingredient analysis of few types of formulations representing different methods of analysis -acidimetry, alkalimetry, non-aqueous.</li> <li>6. Determination of sulphate ash, loss of drying &amp; othertestsofbulkdrugs,completeIPmonographofthreedrugs representingvariety of testing</li> <li>7. Evaluation of crude drugs - macroscopic examination, determination &amp;identification of starch granules, calcium oxalate</li> </ol>		30
Keywords	Synthesis of organic compound, Crude test, Limit test, Pharmaceutical Packaging.		

Signature of Convener & Members (CBoS):

## PART-C: Learning Resources

### Text Books, Reference Books and Others

#### Text Books Recommended –

1. Vasudevan, T.N. (2006). *Practical Pharmacognosy*. New Delhi, India: Vallabh Prakashan.

#### Reference Books Recommended –

1. Wills, T.B. (2008). *Practical Pharmacognosy*. London, England: CBS Publishers & Distributors Pvt Ltd.
2. Vogel, A.I. (2000). *Vogel's Textbook of Quantitative Chemical Analysis*. Harlow, England: Pearson Education Limited.
3. Mann, A.K. (2007). *Practical Organic Chemistry*. New Delhi, India: Orient Blackswan.

### Online Resources–

- <https://www.sciencedirect.com/topics/engineering/raw-material-preparation>
- <https://www.ncbi.nlm.nih.gov/books/NBK92218/>
- <https://www.jiwaji.edu/pdf/ecourse/pharmaceutical/Evaluation%20of%20crude%20drugs.pdf>

## PART-D: Assessment and Evaluation

### Suggested Continuous Evaluation Methods:

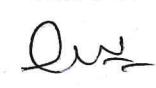
Maximum Marks: 50 Marks

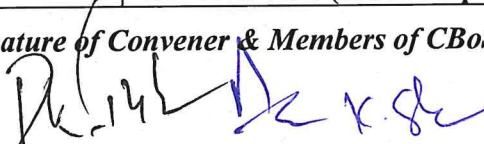
Continuous Internal Assessment(CIA): 15 Marks

End Semester Exam(ESE): 35Marks

<b>Continuous Internal Assessment (CIA):</b> (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
	<b>End Semester Exam (ESE):</b>	<b>Laboratory / Field Skill Performance: On spot Assessment</b> J. Performed the Task based on lab. work - 20 Marks K. Spotting based on tools & technology (written) – 10 Marks L. Viva-voce (based on principle/technology) - 05 Marks

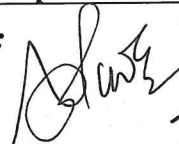
Name and Signature of Convener & Members of CBoS:

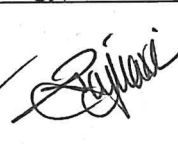
  
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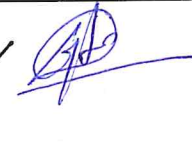
  
R. K. Singh

  
Anurag

  
Bahar

  
Anurag

  
Rajni

  
Anurag