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

PART-A: Introduction				
Program:Bachelor in Science *(Degree/Honors)*			**Semester VI**	Session: **2024-2025**
1	**CourseCode**	**ICSC-06T**		
2	**CourseTitle**	**PHARMACEUTICALS**		
3	**CourseType**	**DSC**		
4	**Pre-requisite(if,any)**	***As per program***		
5	**Course Learning. Outcomes(CLO)**	➢ **To correlate and compare the historical background/development of Indian and other important pharmacopoeias, and also an understanding of procedures in pharmaceuticals.** ➢ **To describe the manufacture and quality specifications of pharmaceutical excipients/additives, and gain an understanding of the applications of sutures, ligatures, and surgical dressings.** ➢ **To acquaint students with packaging/ancillary materials, machinery, and important legal aspects of the food and drug industry.** ➢ **To explain and compare the various statistical tools and testing methods employed for pharmaceutical quality control.**		
6	**CreditValue**	**3 Credits**	***Credit = 15 Hours -learning & Observation***	
7	**TotalMarks**	**Max.Marks:**	**100**	**Min Passing Marks:40**

PART -B: Content oftheCourse		
TotalNo.of Teaching–learning Periods(01 Hr. per period) - 45 Periods (45 Hours)		
Unit	**Topics(Coursecontents)**	**No.ofPeriod**
I	Historicalbackground&development ofpharmaceutical industryinIndia in brief.Pharmacopoeias-DevelopmentofIndianpharmacopoeia& introduction fB.P.,U.S.P., E.P., N.F&other important Pharmacopoeias. Introductiontovarioustypesofformulations&routesofadministration.Asepticconditions,need forsterilization,variousmethodsofsterilization.	**12**
II	Various types of pharmaceutical excipients, their chemistry, process of manufacture & quality specifications. Glidants, lubricants, diluents, preservatives, antioxidants, emulsifying agents, coating agents, binders, coloring agents, flavouring agents, gelatin and other additives, sorbitol, mannitol, viscosity builders etc. Surgical dressing, sutures, ligatures with respect to the process, equipment used for manufacture, method of sterilization and quality control.	**11**
III	Pharmaceutical packaging introduction, package selection, packaging materials, ancillary materials, packaging machinery, quality control of packaging materials. F.D.A. Important schedules & some legal aspects of drugs. Pharmaceutical quality control (other than analytical methods covered under core subject) sterility testing, pyrogenic testing, glass testing, bulk density of powders etc.	**11**
IV	Evaluation of crude drugs - Moisture content, extractive value, volatile oil content, foreign organic matter, quantitative microscopic exercises, including starch, leaf content (palisade ratio, stomatal number & index, vein, islet number & vein	**11**

	termination number), crude fiber content, introduction to chromatographic method for identification of crude drugs. Chromatography: Paper chromatography, TLC, HPLC, GLC. Ion chromatography	
Keywords	***Pharmacopoeias, Formulations, Excipients, Sterilization, Packaging, Testing, Chromatography, HPLC,TLC.***	

SignatureofConvener&Members (CBoS):

PART–C:Learning Resources

Text Books, Reference Books and Others

Text Books Recommended –

1. *Mehrotra, K.N. (2005). Handbook of Drugs and Cosmetic Act. PharmaMed Press.*

Reference Books Recommended –

1. *Remstad, J.P. (1996). Modern Pharmacognosy. McGraw Hill.*
2. *Indian Pharmacopoeia (1985). Government of India, Ministry of Health and Family Welfare.*
3. *British Pharmacopoeia (1990). Her Majesty's Stationery Office.*
4. *Pharmaceutical Dosage Forms (2008). Lippincott Williams & Wilkins.*

Online Resources:

- https://igmpi.ac.in/IGMPIcampaign/Adword.php?gad_source=1&gclid=Cj0KCQjwgJyy-BhCGARIsAK8LVLMgtVOcIgWqnEjZ4SAUFYBfoY4nDDOTl_JwT0iVAkjhH85hZYjsHkaAoRHEALw_wcB
- https://www.slideshare.net/slideshow/different-techniques-of-pharmaceutical-analysis-239579341/239579341
- https://pubmed.ncbi.nlm.nih.gov/36179505/

PART-D:Assessment andEvaluation

Suggested Continuous Evaluation Methods:
MaximumMarks: 100 Marks
ContinuousInternal Assessment(CIA):30 Marks
EndSemesterExam(ESE):70 Marks

Continuous InternalAssessment (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.,**1out 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 *(Degree/Honors)*			**Semester-VI**	Session: **2024-2025**
1	**CourseCode**	**ICSC-06P**		
2	**CourseTitle**	**INDUSTRIAL CHEMISTRY LAB. COURSE-VI**		
3	**CourseType**	**DSC**		
4	**Pre-requisite(if,any)**	***As per program***		
5	**Course Learning. Outcomes(CLO)**	➢ To learn techniques for analyzing plant materials, conducting microbiological testing of drugs, ➢ To estimate drug concentration using spectrophotometry. ➢ To gain hands-on experience formulating pharmaceutical dosage forms ➢ To analyze fats, oils, and jewelry for their respective properties and composition.		
6	**CreditValue**	**1 Credits**	***Credit =30 Hours Laboratory or Field learning/Training***	
7	**TotalMarks**	**Max.Marks:50**		**Min Passing Marks:20**

PART -B: Content oftheCourse		
Total No. of learning-Training/performancePeriods:30 Periods (30 Hours)		
Module	**Topics(Coursecontents)**	**No. of Period**
Lab./Field Training/ Experiment Contents of Course	1. Palisade ratio, stomatal index - determination and identification of few drugs, TLC method for identification. 2. Microbiological testing - determination of MIC of some antibacterial drugs by zone/cup plate method. 3. Spectrophotometric estimation of drugs – ciprofloxacin, paracetamol, etc. 4. Preparation of pharmaceutical formulations like cream, suspension, and emulsions. 5. Determination of saponification value of oil/polymeric materials. 6. Determination of iodine value of oil/polymeric materials. 7. Quantitative analysis of jewelry. 8. Determination of ash content in polymeric substance.	**30**
Keywords	***Stomatal Index, Microbial testing, estimation, spectrometry, Saponification, cup-plate method, iodine value, ash content***	

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. Vallabh Prakashan.*
2. *Birajdar Arunadevi S. (2018). Basic Principles of Chromatography and HPLC. Springer*

Reference Books Recommended –

1. *Wills, T.B. (1987). Practical Pharmacognosy. CBS Publishers & Distributors.*
2. *Vogel, A.I., et al. (1989). Vogel's Textbook of Quantitative Chemical Analysis. Longman Scientific & Technical.*

Online Resources–

- **https://jru.edu.in/studentcorner/lab-manual/dpharm/1st-year/Pharmaceutics.pdf**
- **https://link.springer.com/book/10.1007/978-3-031-20298-8**
- **https://www.newhaven.edu/ resources/documents/academics/surf/past-projects/2013/kasey-cargill-paper.pdf**
- **https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/iodine-value#:~:text=It%20is%20defined%20as%20the,and%20all%20results%20are%20summed.**

PART-D:Assessment andEvaluation

Suggested Continuous Evaluation Methods:
MaximumMarks: 50 Marks
ContinuousInternal Assessment(CIA):15 Marks
EndSemesterExam(ESE):35Marks

Continuous InternalAssessment(CIA): **(By Course Teacher)**	Internal Test / Quiz-(2): **10 &10** Assignment/Seminar +Attendance- **05** Total Marks -**15**	Better marks out of thetwo Test / Quiz +obtained marks in Assignment shall be considered against **15** Marks
End Semester Exam (ESE):	**Laboratory / Field Skill Performance: On spot Assessment** **M. Performed the Task based on lab. work - 20 Marks** **N. Spotting based on tools& technology (written) – 10 Marks** **O. Viva-voce (based on principle/technology) - 05 Marks**	**Managed by Course teacher as per lab. status**

Name and Signature of Convener & Members of CBoS: