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

PART- A: Introduction				
Program: Bachelor in Science *(Diploma / Degree/Honors)*			**Semester - IV**	Session: **2024-2025**
1	**Course Code**	**CHSE-02P**		
2	**Course Title**	**ENVIRONMENTAL CHEMISTRY LAB. COURSE**		
3	**Course Type**	**DSE**		
4	**Pre-requisite** (if, any)	-		
5	**Course Learning Outcomes (CLO)**	➢ *To know the basic idea on techniques of water analysis and acidity alkalinity* ➢ *To get experience with the calculations of BOD and COD* ➢ *To understand the basics of soil analysis viz. pH, Conductivity.* ➢ *To have an experience on the determination of heavy metals in soil and Colorimetric estimation of iron and manganese.* ➢ *To familiarize with interpretation of data*		
6	**Credit Value**	**01Credit**	*Credit =30 Hours Laboratory or Field learning/Training*	
7	**Total Marks**	**Max.Marks:50**	**Min. Passing Marks:20**	

PART-B: Content of the Course

Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)

Module	Topics(Course contents)	No. of Period
Lab./Field Training/ Experiment Contents of Course.	**Water Analysis** a. Alkalinity b. Acidity c. Temporary, Permanent and total hardness d. Sulphate e. Phosphorus	**30**
	Water analysis e. Nitrites f. Chlorides g. D.O, BOD and COD h. Insecticides i. Pesticides Analysis of chemicals used in water and waste water treatment-Alum, bleaching powder, activated carbon. Determination and comparison of chlorine content in tap water, storage tank and swimming pool.	
	Soil Analysis Determination of: a. pH b. Conductivity c. Ca d. Mg e. Heavy metals like Cr, Pb, Cd, Zn.	
	Miscellaneous Analysis of nutrients – Nitrogen (total, ammonia,nitrite, and nitrate), Phosphate Determination of N,P,K of soil	

	Determination of macro and micro nutrients in soil. Sampling of water- tap water, well water, overhead storage tank water pond water and lake water. Physicochemical and organoleptic characteristics of the above water samples. Statistical evaluation of the data obtained for optimization of results. Determination of Total solids, Total dissolved solids and total suspended solids and its significance. Determination of noise pollution in a particular area with noise dosimeter. Study of particulate matter. Study of atmospheric chemistry. Air Monitoring Gas detection.
Keywords	***Sampling, Water, soil, N/P/K, pH, Conductivity, acidity & alkalinity, Heavy metals.***

Signature of Convener & Members (CBoS) :

PART–C

Learning Resources: Text Books, Reference Books andOthers

Textbooks Recommended–

1. *Dara, S. S., & Asole, B. G. (2017). Environmental chemistry: Practical approach (2nd ed.). New Age International (India) Publishers.*
2. *Trivedi, R. K., Goyal, P., & Trisal, B. S. (2018). Manual of water and wastewater analysis (2nd ed.). ABD Publishers & Distributors.*
3. *Sehgal, H. S. (2010). A textbook of soil chemical analysis (2nd ed.). Kalyani*

Reference Books Recommended–

1. *Vogel, A. I. (1955). A text-book of quantitative inorganic analysis: theory and practice. Longmans,*
2. *Green and Company.*
3. *Sandell, E. B. (1945). Colorimetric determination of traces of metals (Vol. 59, No. 6, p. 481). LWW.*
4. *Boubel, R. W., Vallero, D., Fox, D. L., Turner, B., & Stern, A. C. (2013). Fundamentals of air*
5. *pollution. Elsevier.*
6. *Clesceri, L. S. (1998). Standard methods for examination of water and wastewater. American public*
7. *health association, 9.*
8. *Rump, H. H. (1999). Laboratory manual for the examination of water, waste water and soil (No. Ed. 3). Wiley-VCH Verlag GmbH.*

OnlineResources– e-Resources/e-booksande-learningportals

- https://ncert.nic.in/textbook/pdf/kech207.pdf
- https://archive.nptel.ac.in/courses/122/106/122106030/
- https://scienceinfo.com/environmental-chemistry-definition-importance-application-and-careers/
- https://www.ncbi.nlm.nih.gov/books/NBK83730/
- https://ebooks.inflibnet.ac.in/esp16/chapter/water-pollution/#:~:text=The%20amount%20of%20dissolved%20oxygen,dissolved%20oxygen%20than%20saline%20water.
- https://chem.libretexts.org/Bookshelves/General_Chemistry/Map%3A_Chemistry_-_The_Central_Science_(Brown_et_al.)/18%3A_Chemistry_of_the_Environment
- https://byjus.com/chemistry/environmental-chemistry/
- https://www.nrdc.org/stories/water-pollution-everything-you-need-know#whatis
- https://www.envirotech-online.com/news/gas-analyser/157/envea/portable-multi-gas-analyser-gains-qal1-certification-for-so2/60799.

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** **D. Performed the Task based on lab. work - 20 Marks** **E. Spotting based on tools & technology (written) – 10 Marks** **F. Viva-voce (based on principle/technology) - 05 Marks**	**Managed by Course teacher as per lab. status**

Name and Signature of Convener and Members of CBoS