

ENGINEERING CHEMISTRY LABORATORY

Course Code	21CHEL16/26	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2	SEE Marks	50
Credits	01	Exam Hours	3hrs

Course objectives:

CLO1	Quantitative analysis of materials by volumetric and chemical methods.
CLO2	Instrumental methods for developing experimental skills in building technical competence

SL.N O	Instrumentation Experiments
1	Potentiometric estimation of FAS using standard $K_2Cr_2O_7$ solution.
2	Conduct metric estimation of the acid mixture.
3	Determination of Viscosity coefficient of a given liquid using Ostwald's viscometer
4	Colorimetric estimation of copper.
5	Determination of pKa value of a given weak acid using a pH meter
Volumetric experiments	
1	Estimation of Total hardness of water by EDTA complexometric method.
2	Estimation of CaO in cement solution by rapid EDTA method.
3	Determination of percentage of copper in brass using standard sodium thiosulphate solution.
4	Determination of Chemical oxygen demand of industrial wastewater.
5	Estimation of percentage of iron in the given rust solution using standard Potassium Dichromate solution (External indicator method)
Demonstration Experiments (For CIE)	
1	Flame photometric estimation of Sodium & Potassium.
2	Synthesis of nanomaterial by Precipitation method.

Course outcomes (Course Skill Set):

At the end of the course the student will be able to:

C01	Determine the pKa and coefficient of Viscosity of a given organic liquid.
C02	Estimate the amount of substance present in the given solution using Potentiometer Conductometric and Colorimetric analysis
C03	Determine the total hardness and chemical oxygen demand in the given water sample by volumetric analysis method
C04	Determine the percentage of Cao, copper, and Iron in the given analyte solution by titration method.
C05	Demonstrate flame photometric estimation of sodium & potassium and the synthesis of nanomaterials by Precipitation method.

Assessment Details (both CIE and SEE)

Continuous Internal Evaluation (CIE): The CIE marks awarded in the case of Practical shall be based on the weekly evaluation of laboratory journals/ reports after the conduction of every experiment and one practical test.

Semester End Evaluation (SEE): The practical examinations are to be conducted as per the timetable of the University in batch-wise with the strength of students not more than 10-15 per batch.

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

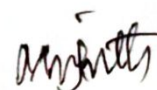
Suggested Learning Resources:

Text Books:

1. Vogel's A.I. A textbook of quantitative analysis, 35th edition, 2012.
2. Willard, Merit, Dean and Settle, A textbook of Instrumental analysis, 6th edition 2012.

Reference books:

1. G.H Jeffery, J Bassett, J Mendham, and R.C. Denney Vogel's A.I. A textbook of quantitative analysis, Dorling Kindersley (India) Pvt., Ltd. 35th edition, 2012.
2. Gary D Christian, Analytical Chemistry, Wiley India, 6th edition, 2015.
3. T. Pradeep, A Textbook of Nanoscience and Nanotechnology, McGraw Hill Education (India) Pvt., Ltd., 1st edition, 2015



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