

SRI VENKATESWARA UNIVERSITY::TIRUPATI
S.V.U. COLLEGE OF SCIENCES;
DEPARTMENT OF CHEMISTRY
(Syllabus common for SV University College and affiliated by SVU Area
W.E.F. 2021-2022
SCHEME OF INSTRUCTION AND EXAMINATION
M.Sc. CHEMISTRY

M.Sc. INORGANIC CHEMISTRY

SEMESTER-IV

Sl. No	Course Code	Components of Study	Title of the Course	Credit Hrs/Week	No. of Credits	IA Marks	SEM End Exam Marks	Total
1	CHE-IC-401	Core-Theory	Co-ordination compounds, Organometallic chemistry of non-transition elements	6	4	20	80	100
2	CHE-IC-402	Core-Theory	Instrumental Methods of Analysis	6	4	20	80	100
3	CHE-IC-403	Generic Elective*	(a) Applied and Environmental aspects	6	4	20	80	100
			(b) Bioinorganic, Bioorganic & Biophysical Chemistry					
4	CHE-IC-404	Core & Gen. Practicals	Instrumental methods of Analysis -II	6	4	-	-	100
5	CHE-IC-405	Multi disciplinary Course / Project work	Project work	6	4	-	-	100
6	CHE-406	Open Elective (For other departments)	(a) Drug Chemistry (b) Electro analytical Techniques	6	4	20	80	100
		Total		36	24			600

*Among the Generic Elective a student shall choose any one.

CHE : IC 403(A): (GENERIC ELECTIVE) APPLIED AND ENVIRONMENTAL ASPECTS

UNIT-I: SAMPLING AND SEPARATION METHODS

15 Hrs

Preparing the sample for analysis: Sampling, The effect of sampling uncertainties, Gross sample, determination of the size of the gross sample. Analytical sample. Preparation of laboratory sample from gross sample, Moisture in the sample, Karl-Fisher reagent for the determination of moisture content in samples.

Decomposition and dissolving the sample: Decomposition of sample by fluxes, wet digestion, dry ashing, combustion with oxygen, microwave decomposition.

Separation and pre-concentration: Extractive separation of metal ions as chelates (dithizone, oxine, APDC, NaDDTC), Solid-phase extraction

UNIT-II: ANALYSIS OF AGRO CHEMICALS and MINERALS

15 Hrs

Soil analysis: Soil moisture, pH, total nitrogen, Phosphorus, silica, boron and metals (Cd, Cu, Fe, Mn, and zinc) in soil.

Fertilizer analysis: Analysis of Ammonical fertilizers, Phosphate fertilizers, Nitrate fertilizers

Pesticide Analysis: Analysis of organo chlorine pesticides by gas chromatography, Determination of DDT residue in vegetable and food grains. Analysis of organo phosphorous pesticides (Malathion, parathion) by spectrophotometric and chromatographic methods.

Analysis of Minerals and Ores: Limestone, Ilmenite, Chalcopylites and Beryl. Analysis of Cement, Ceramics and glass.

UNIT-III: ANALYSIS OF COMPLEX MATERIALS

15 Hrs

Analysis of Fuels: Coal, proximate and ultimate analysis, heating values and grading of coal.

Liquid Fuels: Flash point, aniline point, octane number and carbon residue.

Analysis of Gaseous Fuels: Producer gas, Water gas, Calorific values

Analysis of alloys: German Silver, Brass, bronze, Solder, Steels containing elements such as Mo, Co, V, Cr, Si and Ni.

Analysis of Explosives: Introduction, Classification, Deflagrating or low explosives, Characteristics of explosives, Nitrocellulose, PETN or PENTHRITE, Di-nitrobenzene (DNB), Trinitrobenzene (TNB), Trinitrotoluene (TNT),

UNIT – IV: ENVIRONMENTAL POLLUTION MONITORING:

15 Hrs

Water Quality monitoring: Methods of water sample collection, Determination of Dissolved oxygen(D.O), Biochemical Oxygen Demand(BOD) and Chemical Oxygen Demand(COD)

Analytical methods for the determination of the following ions in water:

Anions: F^- , PO_4^{3-} , NO_3^- , NO_2^- Cations: Cr^{6+} , As^{5+} , Pb^{2+} , Hg^{2+} , Cd^{2+}

Air Quality Monitoring: Air sampling methods, Chemical analysis of the following Air pollutants. i) Gaseous pollutants: Carbon monoxide (CO), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), Aliphatic hydrocarbons and polycyclic aromatic hydrocarbons (PAH). (ii) Particulate matter

Books Suggested

1. Analytical Chemistry, Gary D. Christian, John Laliley and Senes, New York, 6th Ed., 2007.
2. Fundamentals of ANALYTICAL CHEMISTRY, Skoog, West, Holler; 7th Editin 2001
3. Analytical Chemistry Principles and Techniques, I.G. Harge, Prentice Hall.
4. Principles of Instrumental analysis, D.A. Skoog and J.L. Loacy, W.B. Saunders.
5. Fundamentals of Air Pollution By A.C. Strem and others, Academic Press, 1975.
6. Standard methods for the examination of water and waste water published by American public health association, 15th Ed.1981.
7. Methods of Soil Analysis, C.A. Black, Part I and II.
8. Handbook of Analytical Control of Iron and Steel Production, Harrison John Weily 1979
9. Standard methods of Chemical Analysis, Welcher
10. Technical Methods of Analysis, Griffin, Mc Graw Hill
11. Environmental Chemistry, Anil Kumar De, Wiley Eastern Ltd.