Anil Neerukonda Institute of Technology & Sciences (Autonomous)
(Permanent Affiliation by Andhra University & Approved by AICTE
Accredited by NBA (ECE, EEE, CSE, IT, Mech. Civil & Chemical) & NAAC)
Sangivalasa-531 162, Bheemunipatnam Mandal, Visakhapatnam District
Phone: 08933-225083/84/87 Fax: 226395
Website: www.anits.edu.in email: principal@anits.edu.in

Material Chemistry Lab Syllabus
(For 1/IV B.Tech Civil 2023-24)
WEF 2023-24

Course Code: 23CY1203

L	T	P	E	O	Credits	Semester marks	Sessional
-	-	3	-	-	1.5	50	50

Instruction: 3 periods per week **Credits**: 1.5
End exam: 3 hours **Sessional marks**: 50
Prerequisites: Chemistry at +1 and +2 level **End exam marks**: 50

Course Objectives:

1. To impart students with practical knowledge and hands-on experience in analytical chemistry and its engineering applications.
2. To enhance students' proficiency in utilizing instrumental analysis techniques for industrial and environmental applications.

By the end of the course,

CO	Statement
1	Apply volumetric analysis and titration principles to prepare standard solutions, standardize acids with strong bases, and assess water quality, food, and soil samples.
2	Proficiently employ diverse analytical methods (spectrophotometric, pH metric, conductometric, and potentiometric) to estimate chemical properties of substances and accurately interpret data results.
3	Cultivate problem-solving and critical thinking skills through practical application of analytical methods and instrumentation in engineering design and decision-making.

List of Experiments

1. Preparation of standard solutions and standardisation of acid using a strong base by neutralisation method
2. Determination of Hardness in ground water sample (EDTA Method)
3. Estimation of Zinc in a ground water sample / Zinc Ore by complexometric method.
4. Estimation of Iron in Cement using Permanganometric method.
5. Determination of Copper in copper ore using iodometric method.
6. Estimation of lime in a cement sample using Permanganometric method
7. Determination of strength of acidic content in a soil sample using pH metric method (instrumentation method).

8. Determination of electrolytic strength in Soil by using conductometric method.

9. Estimation of Chromium in chrome steel by Redox method using potentiometer.

10. Determination of viscosity of various oil samples using Ostwald viscometer.

Demonstration Experiments

11. Determination of available chlorine content in a sample of bleaching powder.

12. Tests on soil- Determination of pH, $CaCO_3$, total soluble sulphates.

13. Estimation of metal ion (Fe, Cu, Mn, Cr, Ni) content in a soil sample using spectrophotometric method.

Prescribed Text books

1. Vogel's text book of Quantitative analysis, 5^{th} edition, 1996, G.H.Jeffery, J.Bassett, J.Mendham, R.S.Denney.
2. Vogel's A text book of Macro and semi micro Inorganic analysis, 5^{th} edition.1996, revised by G.Svehla.