NIRMA UNIVERSITY
School of Engineering, Institute of Technology
B.Tech. in Chemical Engineering

Open Elective Course

L	T	P	C
3	0	0	3

Course Code	**XXXXX**
Course Title	**Chemical Analytical Techniques**

Course Outcomes (CO):

At the end of the course, student will be able to-

1. relate the fundamentals and their application in various field of engineering
2. identify and apply the principles of analytical techniques
3. select appropriate method of analysis and interpret its result

Syllabus:

		Teaching Hours
Unit I	**Overview of Analytical Techniques** Introduction to various analytical methods, characterization techniques of engineering materials	**04**
Unit II	**Ultraviolet spectroscopy** Origin and theory of ultraviolet spectra, types of transition of organic and inorganic molecules, chromophore, bathochromic shift, hypsochromic shift, Woodward-Fisher rules for calculating λmax	**12**
Unit III	**Infrared spectroscopy** Electromagnetic spectrum, modes of molecular vibration, theory and interpretation of IR spectra	**12**
Unit IV	**Physico-Chemical Analysis** Thermogravimetric analysis, differential scanning colorimetry, X-ray diffraction, energy dispersive X-Ray	**14**
Unit V	**Applications of Analytical Techniques** Applications in various domains	**03**

Self Study:

The self study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self study contents.

Suggested Readings:

1. Chatwal, Anand. *Instrumental Methods of Chemical Analysis*, Himalaya Publishing House.
2. Hobart H. Willard, Lynne L. Merritt Jr., John A. Dean, *Instrumental Methods of Analysis*, CBS Publishers.
3. Douglas A. Skoog, Donald M. West, *Fundamentals of Analytical Chemistry*, Cengage Learning.
4. William Kemp, *Qualitative Organic Analysis: Spectrochemical Techniques*, European chemistry series, McGraw-Hill.
5. M. Khopker, *Basic Concepts of Analytical Chemistry*, New Academic Science