PANIPAT INSTITUTE OF ENGINEERING AND TECHNOLOGY, PANIPAT

DEPARTMENT OF PHARMACY

Course: B.Pharmacy

LESSONPLAN

Faculty Name: Dr. Neelam Malik **Class: B. Pharmacy –7thth semester**

Subject : Instrumental Method of Analysis **Subject Code: BP701T**

Scope of the Subject: This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart a fundamental knowledge on the principles and instrumentation of spectroscopic and chromatographic technique. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.

Course outcome: Upon completion of the course student shall be able to

- Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
- Understand the chromatographic separation and analysis of drugs.
- Perform quantitative & qualitative analysis of drugs using various analytical instruments.

- **Number of Lectures**: 45 + 5
- **Each lecture**: 01 hour

Lecture No.	Particular	Remark/Date
Introduction		
Unit 1		
Module 1: UV Visible spectroscopy, Fluorimetry		
1.	Electronic transitions, chromophores, auxochromes, spectral shifts**.**	
2.	Solvent effect on absorption spectra	
3.	Beer and Lambert's law, Derivation and deviation**.**	
4.	Instrumentation - Sources of radiation, wavelength selectors, sample cells	
5.	Detectors Photo tube, Photomultiplier tube, Photo voltaic cell, Silicon Photodiode**.**	
6.	Applications - Spectrophotometric titrations, Single component and multi component analysis	
7.	Theory, Concepts of singlet, doublet and triplet electronic state	
8.	Internal and external conversions, factors affecting fluorescence	
9.	Quenching and instrumentation of Fluorimetry	
10.	Applications of Fluorimetry	
UNIT -ll		
Module 2: IR spectroscopy		
11.	Introduction to IR spectroscopy	

12.	Fundamental modes of vibrations in poly atomic molecules Sample handling	
13.	Factors affecting vibrations	
14.	Instrumentation - Sources of radiation, wavelength selectors	
15.	Detectors - Golay cell, Bolometer, Thermocouple, Thermister, Pyroelectric detector	
Module 3: Flame Photometry		
16.	Principle, interferences, instrumentation	
17.	Applications of Flame Photometry and IR spectroscopy	
Module 4: Atomic absorption spectroscopy		
18.	Principle, interferences, instrumentation of Atomic absorption spectroscopy	
19.	Applications of Atomic absorption spectroscopy	
Module 5: Nepheloturbidometry		
20.	Principle, instrumentation and applications	
UNIT-lll		
Module 6: Chromatography		
21.	Methodology and advantages of Adsorption and partition column chromatography	
22.	Disadvantages and applications Adsorption and partition column chromatography	
23.	Introduction, Principle and Methodology of Thin layer Chromatography	
24.	R_f values, advantages, disadvantages and applications of TLC.	
25.	Introduction and methodology of Paper Chromatography	
26.	development techniques of Paper Chromatography	
27.	Advantages, disadvantages and applications of Paper Chromatography	
28.	Introduction, factors affecting electrophoretic mobility in Electrophoresis	
29.	Techniques of paper, gel, capillary electrophoresis	
30.	Applications of electrophoresis	
UNIT IV		
Module 7: Gas chromatography		
31.	Introduction, theory and instrumentation	
32.	Derivatization and temperature programming	
33.	Advantages and disadvantages	
34.	Applications of Gas chromatography	
Module 8: High performance liquid chromatography (HPLC)		
35.	Introduction and theory of HPLC	
36.	Instrumentation of HPLC	
37.	Advantages and applications of HPLC	
UNIT V		
Module 8: Ion exchange chromatography		
38.	Introduction, classification, ion exchange resins, properties	
39.	Mechanism of ion exchange process	
40.	Factors affecting ion exchange	

41.	Methodology and applications	
Module 9: Gel chromatography		
42.	Introduction and theory	
43.	Instrumentation and applications	
Module : Affinity chromatography		
44.	Introduction and theory	
45.	Instrumentation and applications	
Revision		
46.	Revision of Unit 1 with previous question paper	
47.	Revision of Unit 1l with previous question papers	
48.	Revision of Unit lll with previous question papers	
49.	Revision ofUnit 1V with previous question papers	
50.	Revision of Unit V with previous question papers	

Teacher in-charge **HOD** **Principal**