SANKALCHAND PATEL UNIVERSITY
।। अथातो ज्ञानजिज्ञासा ।।

FACULTY OF PHARMACY
First Semester Master of Science
In Effect from Academic Year 2020-21

Subject Code: 1PA1010101	**Subject Title:** MODERN ANALYTICAL TECHNIQUES
Pre-requisite Subject	**- NONE -**

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)		
				Theory (T)		Total Marks
Lecture	Tutorial	Practical	Credit	University Assessment	Continuous Assessment	Theory
4	NA	NA	4	80	20	100

Scope and Objectives:

This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are UV, Fluorimeter, NMR, Mass spectrometer, IR, HPLC, GC etc.

Learning Outcome:

- Student shall be able to understand the theoretical and practical skills of the instruments
- Student shall be able to do analysis of various drugs in single and combination dosage forms
- Student shall be able to design and develop analytical skills

Unit	Content	Hrs
1	**UV-Visible spectroscopy**: Introduction, Theory, Laws, Instrumentation associated with UV-Visible spectroscopy, Choice of solvents and solvent effect and Applications of UV/Visible Spectroscopy **IR spectroscopy**: Theory, Modes of Molecular vibrations, Sample handling, Instrumentation of Dispersive and Fourier - Transform IR Spectrometer, Factors affecting vibrational frequencies and Applications of IR spectroscopy	15
2	**fluorimetry**: Theory of Fluorescence, Factors affecting fluorescence, Quenchers, Instrumentation and Applications of fluorescence spectrophotometer **Flame emission spectroscopy and Atomic absorption spectroscopy**: Principle, Instrumentation, Interferences and Applications	15
3	**NMR spectroscopy**: Quantum numbers and their role in NMR, Principle, Instrumentation, Solvent requirement in NMR, Relaxation process, NMR signals in various compounds,Chemical shift, Factors influencing chemical shift, Spin-Spin coupling, Coupling constant, Nuclear magnetic double resonance, Brief outline of principles of FT-NMR and 13C NMR. Applications of NMR spectroscopy **Mass Spectroscopy**: Principle, Theory, Instrumentation, Different types of ionization like electron impact, chemical, field, FAB and MALDI, APCI, ESI, APPI, Analyzers like Quadrupole and Time of Flight, Mass fragmentation and its rules, Meta stable ions, Isotopicpeaks and Applications of Mass Spectroscopy	15
4	**Chromatography**: Principle, apparatus, instrumentation, chromatographic parameters, factors affecting resolution and applications of the following: a) Paper chromatography b) Thin Layer chromatography c) Ion exchange chromatography d) Column chromatography e) Gas chromatography f) High Performance Liquid chromatography b) Introduction to LC/MS, GC/MS as hyphenated techniques	15

References:

1 Spectrometric Identification of Organic compounds – Robert M Silverstein, Sixth edition, John Wiley & Sons,2004.

2 Principles of Instrumental Analysis – Doglas A Skoog, F. James Holler, Timothy A. Nieman, 5th edition,

Eastern press, Bangalore,1998.
3 Instrumental methods of analysis – Willards, 7th edition, CBSpublishers.
4 Practical Pharmaceutical Chemistry – Beckett and Stenlake, VolII, 4th edition, CBS Publishers, New Delhi,1997.
5 Organic Spectroscopy – William Kemp, 3rd edition, ELBS,1991.
6 Quantitative Analysis of Drugs in Pharmaceutical formulation – P D Sethi, 3rd Edition, CBS Publishers, New Delhi,1997.
7 Pharmaceutical Analysis- Modern methods – Part B – J W Munson, Volume 11, Marcel Dekker Series
8 Pharmaceutical Analysis by S. Ravishankar
9 Instrumental Analysis by Chatwal&Anand
10 Principle of Instrumental Analysis by AshutoshKar
11 Instrumental Analysis by G. Vidyasagar
12 Principle of Instrumental Analysis by B. K. Sharma