



Karmaveer Bhaurao Patil University, Satara

Syllabus for

IR Experts Skill Level-7

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2024-2025

SKILL DEVELOPMENT COURSES: 2024-25
IR EXPERT
Skill Level: 7

Department of Chemistry

1. Title: IR Expert

2. Year of Implementation: 2024-25

Structure of Skill Development Courses

Skill Level	Theory Hours	Practical Hours	Total Hours	Credits	No. of students in batch
7	15	30	45	02	30

Syllabus

Learning Objectives:

1. To give knowledge about IR Spectroscopy.
2. To make the students familiar about instrument handling.
3. To improve the understanding of students regarding application of instrument in analytics.

Theory Syllabus (15 Hrs)

Unit I-Instrumentation

(07)

Introduction, principle, Instrumentation, sample preparation, Radiation Source, Prism, detectors, single beam and double beam spectrophotometer, FT-IR

Unit II- IR frequency and Band Analysis

(08)

IR region, Lambert-Beer law, methods of IR spectral analysis, Fundamental frequency, Types of band, functional group and their frequency, Nature and appearance of IR band, Interpretation of IR spectra

Practical Syllabus (30 Hrs)

List of Experiments:

(24 Hrs)

- 1) IR sample preparation for solid compounds.
- 2) IR sample preparation for liquid compounds.
- 3) IR sample preparation for gaseous compounds.
- 4) To understand IR software and its functioning.

- 5) To Interpret IR spectra for functional group for alcohol, phenol and ether.
- 6) To Interpret IR spectra for Carbonyl functional group (Aldehyde, Ketone & Acid.)
- 7) To Interpret IR spectra for functional group (Amide, Anhydride & Acyl chloride.)
- 8) To Interpret IR spectra for functional group (Amine and Lactum.)
- 9) To Interpret IR spectra for functional group (Ester and Lactone.)
- 10) Plotting of IR spectrum from obtained data.

Project/Field Visits/ Industrial Visit

(06 Hrs)

Learning Outcomes: After completion of this course students will be able to..

- 1) Perform IR spectrophotometer
- 2) Demonstrate IR spectra for particular functional groups.
- 3) Prepare various samples for IR analysis.

Recommended Books:

1. W. Kemp, Organic Spectroscopy ELBS
2. D. L. Pavia, Lampman, Kriz, Vyvyan Spectroscopy, Indian edition.
3. V.M. Parikh, Application spectroscopy of organic molecules. (Mehata)
4. P.S. Kalsi Spectroscope of organic compounds.
5. Silverstein and Basslar, Spectroscopic identification of organic compounds.

BOS Sub Committee:

1. Dr. S.B. Kamble
2. Miss. A.S. More

Expert Committee:

1. Dr.S.P. Pawar, Asst. Prof, RSCS, Kolhapur
2. Mr. Ajit Ekal, Manager, Insta Vision
Laboratories & Services Satara.