

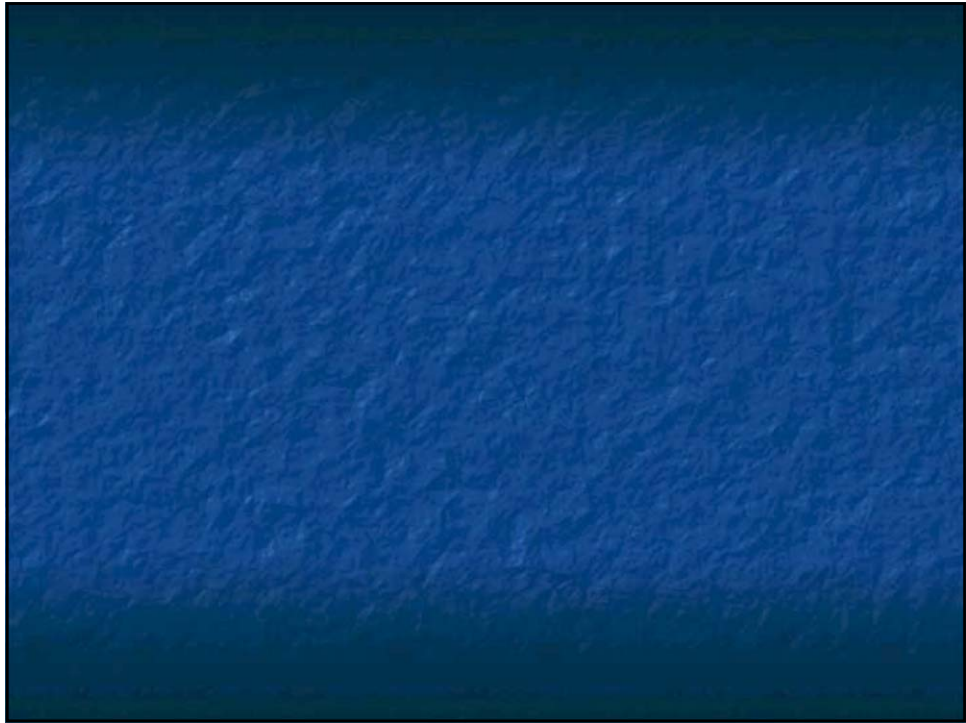


CERTIFICATE PROGRAMME IN LABORATORY TECHNIQUES

(CPLT)

Vijayshri, IGNOU, India

- 1. GOOD LABORATORY PRACTICES**
- 2. LABORATORY TECHNIQUES IN BIOLOGY**
- 3. LABORATORY TECHNIQUES IN CHEMISTRY**
- 4. LABORATORY TECHNIQUES IN PHYSICS**



Description of Programme

Course	No. of Modules	Practical Work	Assessment
Good lab practices	5(1)	7 days (3+4)	1 theory 100 2hours practical cont. 25 final 25
Lab tech in Biology	3 (1)	7 days (3+4)	theory 50 1hour practical cont. 25 final 25
Lab tech in Chemistry	3 (1)	7 days (3+4)	theory 50 1hour practical cont. 25 final 25
Lab tech in Physics	2 (1)	7 days (3+4)	theory 50 1hour practical cont. 25 final 25

LT-1



**LABORATORY ORGANISATION
AND MANAGEMENT – I**

**LABORATORY ORGANISATION
AND MANAGEMENT – II**

HAZARDS IN LABORATORIES

LABORATORY SAFETY

LABORATORY EXERCISE MANUAL

LABORATORY ORGANISATION AND MANAGEMENT - I

- **Organisation and Design of Laboratories:
Introduction**
- **Organisation and Design of Laboratories:
Preparation Room**
- **Organisation and Design of Laboratories:
Store**
- **Day-to-day Management of Laboratories**
- **Stock Control and Purchase**

LABORATORY ORGANISATION AND MANAGEMENT - II

- **Efficient Communication**
- **Files and Records**
- **Scientific Reporting**
- **Use of Computers in Laboratory
Organisation and Management**
- **Information Distribution**

HAZARDS IN LABORATORIES

- Electricity Hazards
- Gas Hazards
- Fire Hazards
- Radiation and Chemical Hazards
- Hazard in Biology Laboratory

LABORATORY SAFETY

- Personal Safety
- Accident and First Aid
- Laws and Regulations

LABORATORY EXERCISE MANUAL

1. Study of Design and Features of a Laboratory
2. Study of Design and Infrastructure of a Preparation Room of a Laboratory
3. Study of Design and Organisation of Laboratory Store
4. Study of Regular Duties of Laboratory Staff
5. Study of Procedure regarding Purchase of Laboratory related Items

6. Study of Procedure for Purchase of Alcohol and its Stock Maintenance
7. Study of Procedure for Stock Verification and Maintenance of Apparatus
8. Study of Basic Aspects of Electrical Maintenance
9. Study of Supply of Gas, Electricity and Water in a Laboratory
10. Identification of Compressed Gases and Study of their Handling and Storage
11. Study of Fire Safety Measures in a Laboratory

12. **Classifying and Handling of Hazardous Chemicals**
13. **Study of Sterilization and Safe Disposal Methods of Biological Materials**
14. **Disposal of Unserviceable and Obsolete Items**
15. **Disposal of Chemical Wastes**
16. **Attending to Emergency Situations**
17. **Group Interaction – Laws, Regulations and Related Issues**

LT-2



- **INTRODUCTION TO BIOLOGY LABORATORIES**
- **MICROSCOPY, STAINING AND CULTURE TECHNIQUES**
- **LABORATORY MANUAL - BIOLOGY**

INTRODUCTION TO BIOLOGY LABORATORIES

- **Biology Laboratory – Introduction**
- **Ancillaries of Biology Laboratory**
- **Equipment Used in Biology Laboratory**
- **Collection and Preservation of Biological Specimens**
- **Herbarium Techniques**

MICROSCOPY, STAINING AND CULTURE TECHNIQUES

- Types of Microscopes
- Basic Techniques of Slide Preparation
- Fixation and Staining Techniques
- Culture of Microorganisms

LABORATORY MANUAL - BIOLOGY

1. Handling Common Laboratory Equipment
2. Laboratory Organisation
3. Procuring Plant Material
4. Procuring Zoological Material for Lab Exercises

5. Setting of Demonstrations of Physiological Processes in Plants
6. Setting Up Apparatus for Demonstrating Physiological Activity in Animals
7. Microscope Handling and Maintenance
8. Preparation of Temporary Slide
9. Preparation Required for Dissections
10. Techniques for Microbial Culture and Gram's Staining

LT-3



- **LABORATORY APPARATUS & EQUIPMENT**
- **LABORATORY TECHNIQUES – I**
- **LABORATORY TECHNIQUES - II**

LABORATORY APPARATUS & EQUIPMENT

- **Scientific Apparatus**
- **Measurement Devices**
- **Care & Maintenance of Glassware**

LABORATORY TECHNIQUES - I

- Glass Working Techniques – I
- Glass Working Techniques – II
- Solutions
- Preparation of Solutions

LABORATORY TECHNIQUES - II

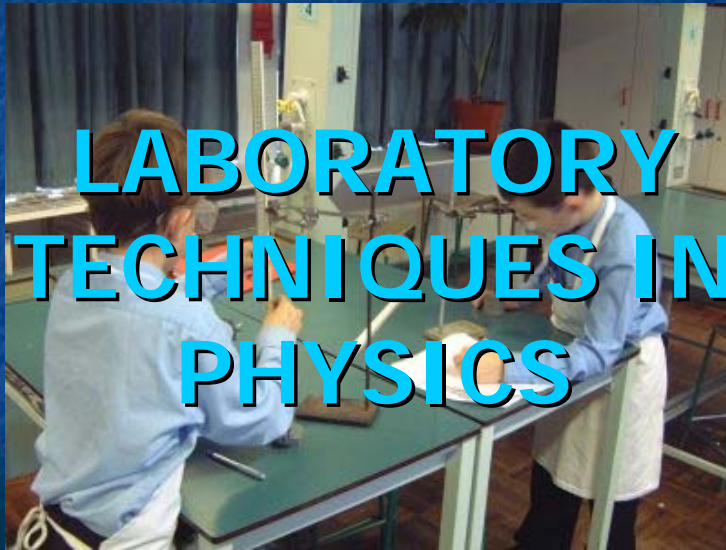
- The Preparative Techniques
- Filtration
- Distillation and Boiling Point Determination
- Recrystallisation and Melting Point Determination
- Chromatography-I
- Chromatography-II

BASIC EXPERIMENTS IN CHEMISTRY

1. Servicing Bunsen burners
2. Cork boring
3. Preparation of H_2S gas by using Kipp's apparatus
4. Calibration of Volumetric Glassware
5. Preparation of Distilled and Deionised Water

6. Centrifugation of a Colloidal Suspension
7. A Simple Titration
8. Preparation of Bench Reagents
9. Use of pH meter and Conductometer
10. Preparation of *p*-Nitroacetanilide
11. Experiments based on Chromatography
12. Glassworking Operations using Bunsen/Batwing Burner
13. Glassworking Operations using a Premixing Burner

LT- 4



LABORATORY TECHNIQUES IN PHYSICS

- BASIC APPARATUS IN PHYSICS
- BASIC EXPERIMENTS IN PHYSICS

BASIC APPARATUS IN PHYSICS

- An Introduction to the Physics Laboratory
- Common Laboratory Tools
- Basic Apparatus
- Optical Apparatus
- Basic Electricity and Electrical Components
- Electrical and Electronic Apparatus

BASIC EXPERIMENTS IN PHYSICS

1. Measurements in Physics
2. Stationary Waves in Stretched Strings
3. Measurement of Thermal Properties

4. Investigations with Mirrors and Lenses
5. Working with a Spectrometer
6. Handling and Maintaining a Multimeter
7. Fabrication of an Extension Board
8. Simple Current and Voltage Measurements
9. Using an Oscilloscope