



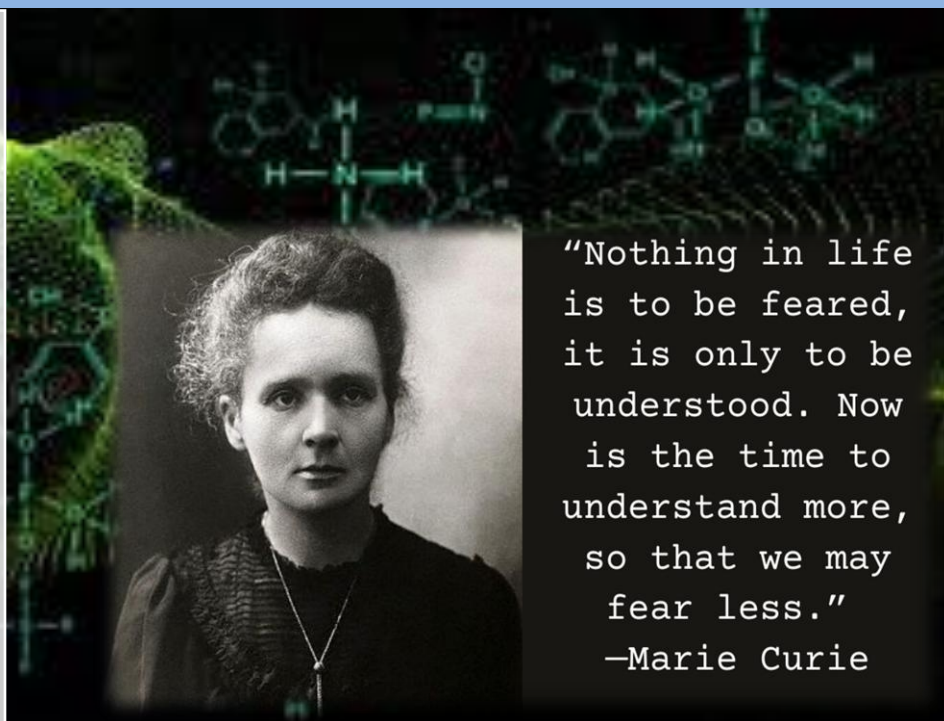
**B.Sc.**  
**COURSE OUTCOME**  
**CALENDAR**  
**SESSION 2024-25**

*DEPARTMENT OF CHEMISTRY*  
*GOVT. M. H. COLLEGE OF HOME SCIENCE AND SCIENCE*  
*FOR WOMEN, JABALPUR*

## COURSE OUTCOMES

### MAJOR PAPER 1 FUNDAMENTALS OF CHEMISTRY

#### B. Sc. First Year



"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."  
—Marie Curie

## MAJOR PAPER 1

### FIRST PAPER -FUNDAMENTALS OF CHEMISTRY

By the end of this course students will learn the following aspects of chemistry:

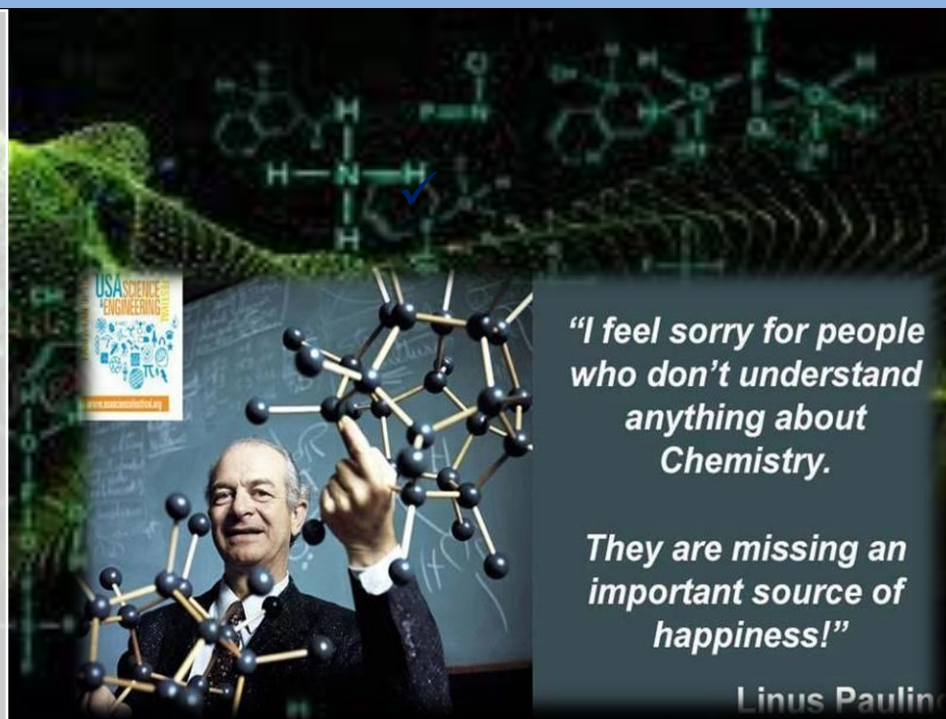
- ✓ Ancient Indian chemical techniques.
- ✓ Various theories and principles applied to reveal atomic Structure.
- ✓ Significance of quantum numbers.
- ✓ Concept of periodic properties of elements.
- ✓ Theories related to chemical bonding.
- ✓ Acid-base concept, pH, buffer.
- ✓ Factors responsible for reactivity of organic molecules.
- ✓ Basics and mechanism of chemical kinetics.
- ✓ Properties of electrolytes.



## COURSE OUTCOMES

### MAJOR PAPER 2 ANALYTICAL CHEMISTRY

### B. Sc. First Year



*"I feel sorry for people who don't understand anything about Chemistry."*

*"They are missing an important source of happiness!"*

Linus Pauling

## MAJOR PAPER 2/MINOR/ ELECTIVE SECOND PAPER -ANALYTICAL CHEMISTRY

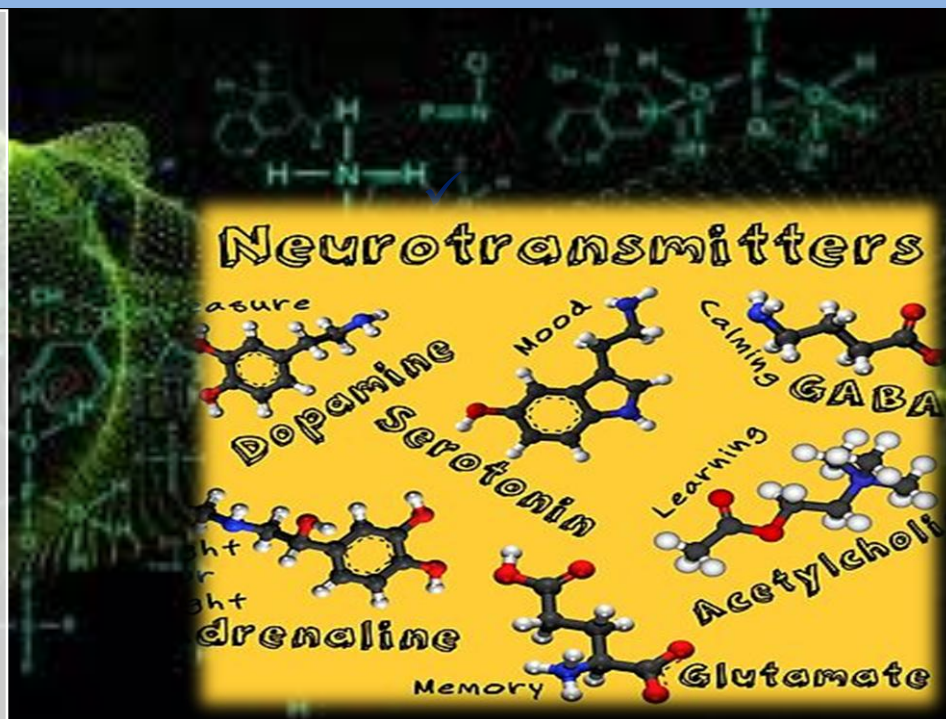
By the end of this course students will learn the following aspects of chemistry:

- ✓ Basic concepts of Mathematics for Chemists.
- ✓ Fundamentals of analytical chemistry and steps involved in analysis.
- ✓ Basic knowledge of Computer for chemistry.
- ✓ Basic Concepts of Chemical equilibrium.
- ✓ Principles of Chromatography and chromatographic techniques.
- ✓ Various techniques of Spectroscopic Analysis.

## COURSE OUTCOMES

### GENERIC ELECTIVE CHEMISTRY IN EVERYDAY LIFE

#### B. Sc. First Year



## GENERIC ELECTIVE CHEMISTRY IN EVERYDAY LIFE

By the end of this course students will learn the following aspects of chemistry:

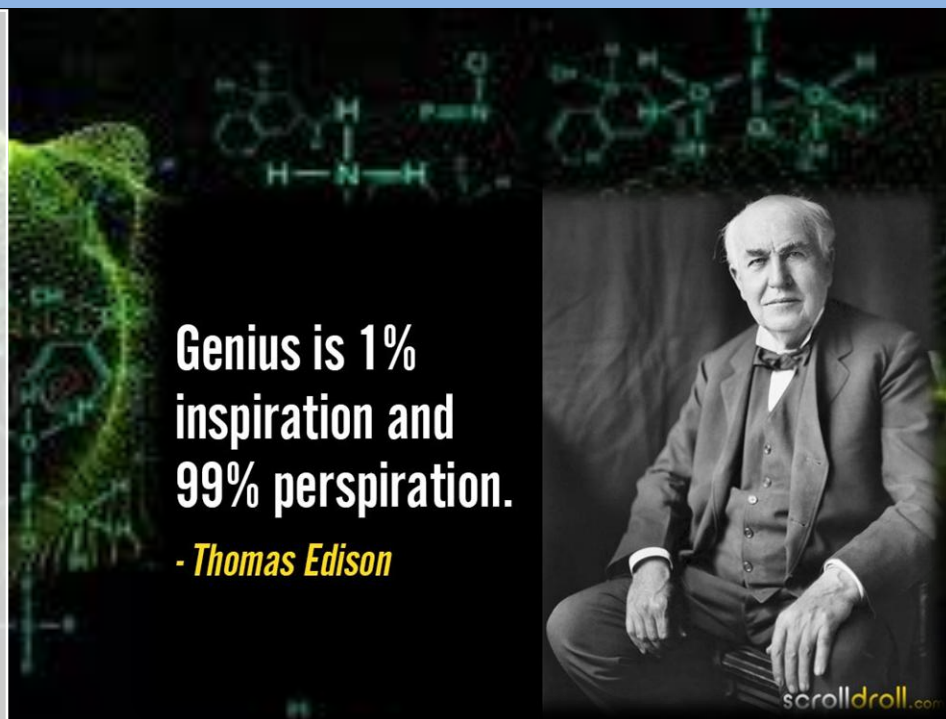
- ✓ Learn about the chemistry of ancient India. Ancient construction materials and discoveries.
- ✓ Gain information about acids, bases and salts involved in our day to day life.
- ✓ Have an idea of food adulteration, its harmful effects, and methods to detect adulteration and the important constituents of our food.
- ✓ Student will be familiar with the chemical nomenclature of the commonly used materials in daily life including toiletries, kitchen and beverages.
- ✓ Have an Elementary idea of disinfectants, pesticides and cleaners.



# COURSE OUTCOMES

## MAJOR PAPER 1 FUNDAMENTALS OF CHEMISTRY

### B. Sc. Second Year



## MAJOR PAPER 1

### REACTIONS, REAGENTS AND MECHANISMS IN ORGANIC CHEMISTRY

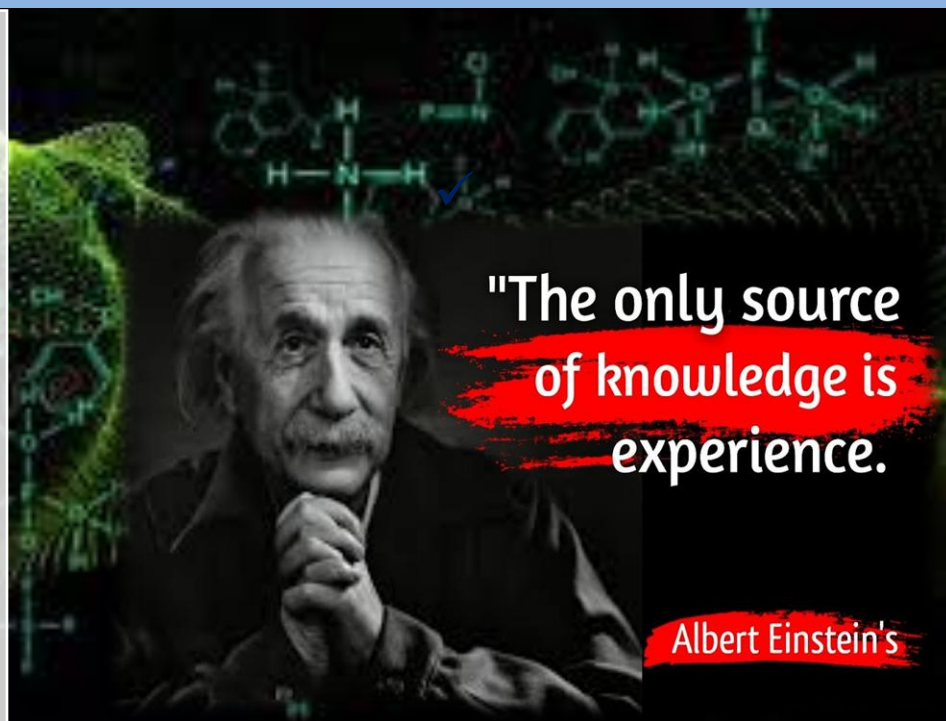
By the end of this course students will learn the following aspects of chemistry:

- ✓ By the end of this course students will acquire the knowledge of following aspects of Chemistry.
- ✓ Various organic reactions, reagents and their mechanisms, which will be helpful in understanding organic synthesis.
- ✓ Application of the reactions in the various industries. like pharmaceutical, polymer, pesticides, textile, Dyes etc.
- ✓ Important key reactions used in further study and Research work.

## COURSE OUTCOMES

### MAJOR PAPER 2 INORGANIC CHEMISTRY

### B. Sc. Second Year



## MAJOR PAPER 2/MINOR/ ELECTIVE

## SECOND PAPER – INORGANIC CHEMISTRY

### TRANSITION ELEMENTS, CHEMI-ENERGETICS, PHASE EQUILIBRIA

By the end of this course students will learn the following aspects of chemistry:

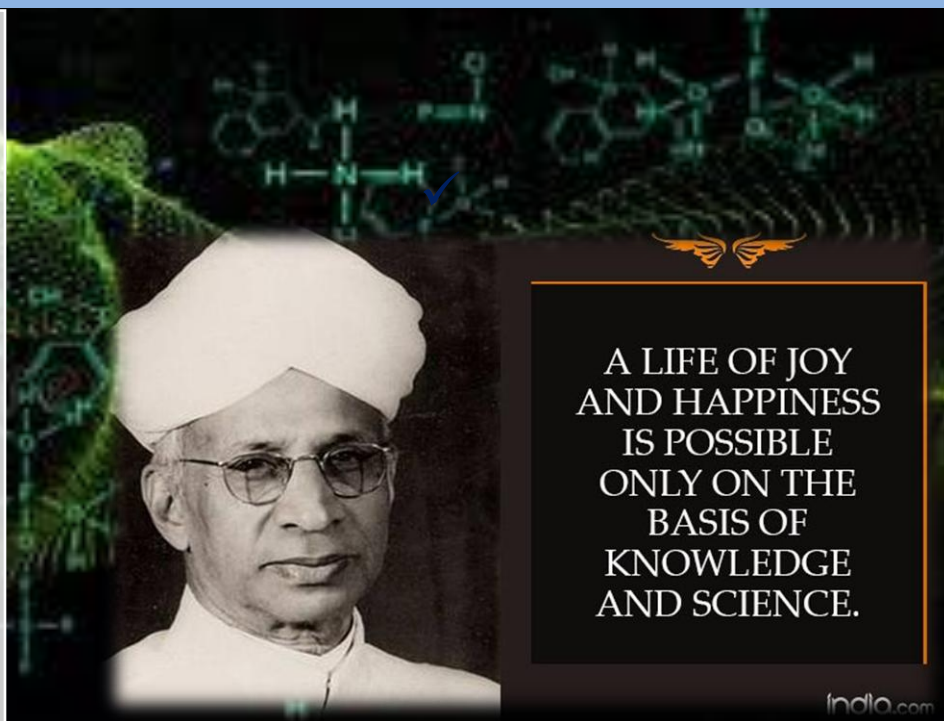
- ✓ Introductory idea about Traditional Indian Chemistry.
- ✓ Chemistry of d- & f-block Elements, Basic Concepts of Coordination Chemistry.
- ✓ Stereochemistry of Transition Metal Complexes.
- ✓ Laws of Thermodynamics.
- ✓ Concepts of Phase Equilibrium with reference to Solid Solution, Liquid-Liquid Mixtures, partially Miscible Liquids.
- Basic Concepts of Electrochemistry



**COURSE OUTCOMES**

**GENERIC ELECTIVE  
CHEMISTRY FOR FARMERS**

**B. Sc. Second Year**



## **GENERIC ELECTIVE CHEMISTRY FOR FARMERS**

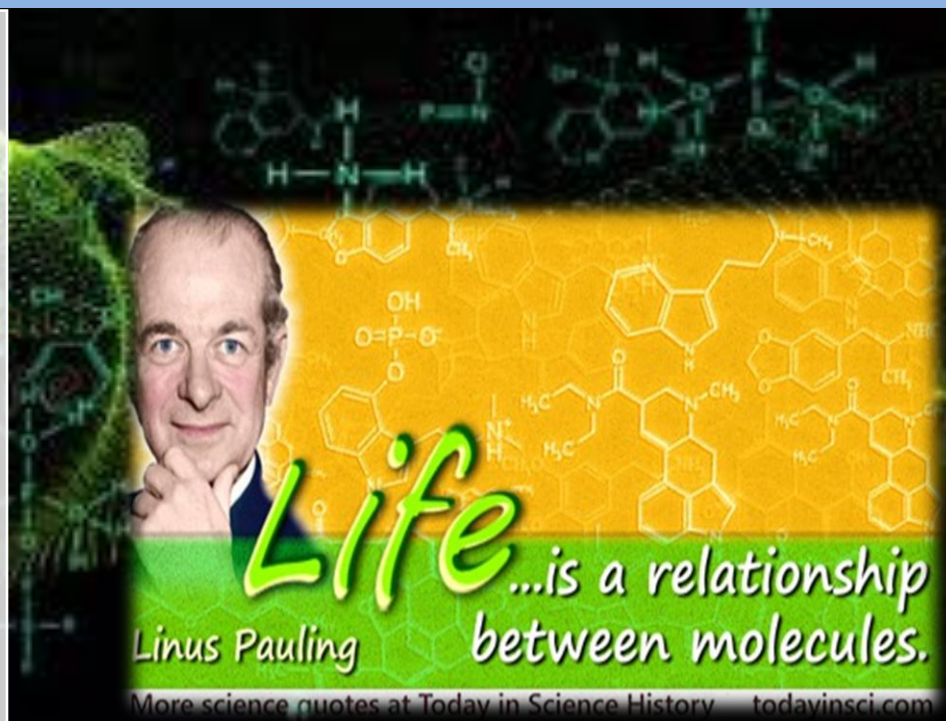
By the end of this course students will learn the following aspects of chemistry.

- ✓ Pro cultivation crop improvement soil and crop management for sustainable organic agriculture production and development.
- ✓ Physical properties of soil and fertilizers types, Soil types and soil structure required for an agricultural field.
- ✓ Analysis and identification of complex agricultural problems and formulating ethical solutions.
- ✓ Innovative processes products and technology to meet the challenges in agriculture and farming practices.
- ✓ Fundamentals of horticulture modern farming and organic farming.

## COURSE OUTCOMES

### MAJOR PAPER 1 INSTRUMENTAL TECHNIQUES IN CHEMISTRY

#### B. Sc. Third Year



## MAJOR PAPER 1

### INSTRUMENTAL TECHNIQUES IN CHEMISTRY

By the end of this course students will learn the following aspects of chemistry:

- ✓ Preparation of standard sample for analysis.
- ✓ Instrumentation for analytical methods of chemistry.
- ✓ Instrumentation for various spectroscopic techniques.
- ✓ Principles and instrumentation of various electro analytical techniques.
- ✓ Instrumentation used in optical methods of analysis.
- ✓ Advanced chromatography technique.

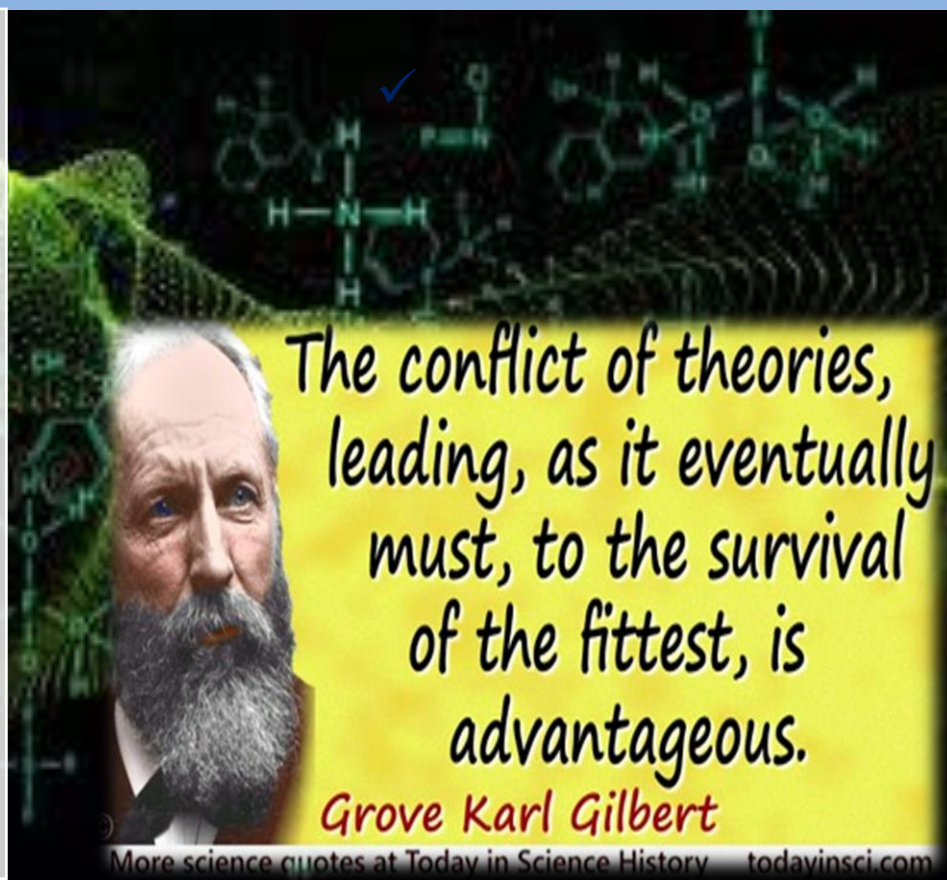


## COURSE OUTCOMES

### MAJOR PAPER 2

BIO PHYSICAL, BIO INORGANIC AND ORGANOMETALLIC CHEMISTRY

### B. Sc. Third Year



## MAJOR PAPER 2/MINOR/ ELECTIVE

### BIO PHYSICAL, BIO INORGANIC AND ORGANOMETALLIC CHEMISTRY

By the end of this course students will learn the following aspects of chemistry:

- ✓ Bio physical concepts like pHbiological oxidation bioenergetics.
- ✓ Magnetic properties and electronic spectra of transition metal complexes.
- ✓ Structure and bonding analysis of organometallic compounds using the MO theory.
- ✓ Organometallic compounds of main group elements and their structure and bonding analysis.
- ✓ Bio Inorganic Chemistry and role of metal ions in biological system.

## COURSE OUTCOMES

### GENERIC ELECTIVE PROCESSING OF FATS AND OILS

#### B. Sc. Third Year



Clemens Winkler

The world of chemical reactions is like a stage, on which scene after scene is ceaselessly played. The actors on it are the elements.

AZ QUOTES

## GENERIC ELECTIVE PROCESSING OF FATS & OILS

By the end of this course students will learn the following aspects of chemistry.

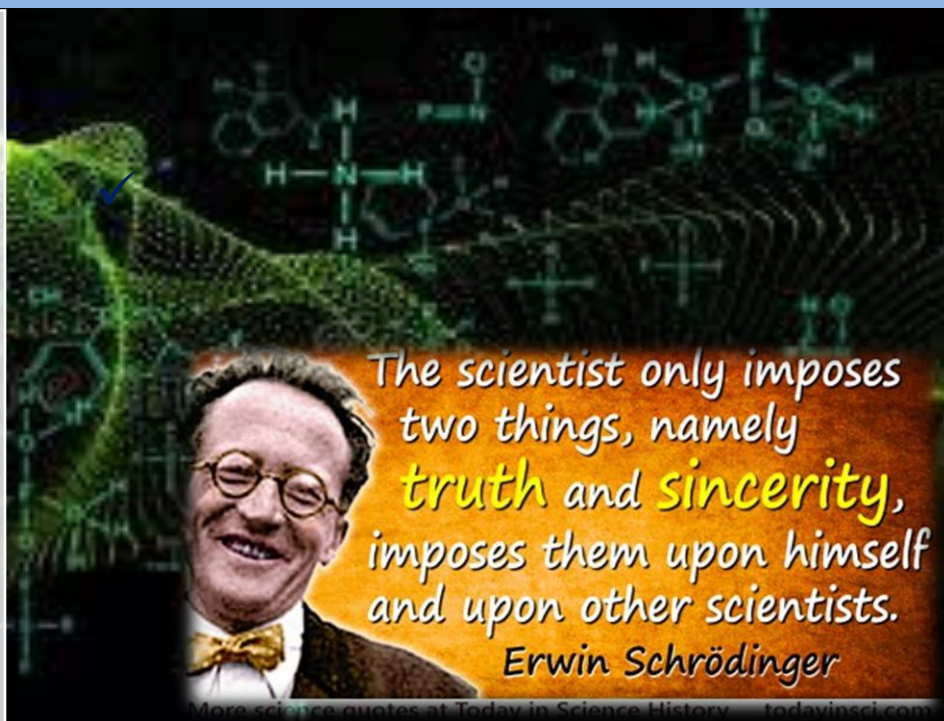
- ✓ Gain knowledge about traditional Indian oil and traditional Indian oil processing methods.
- ✓ Gain the knowledge about importance type natural resources of fats and oils and their effect on health.
- ✓ Learn the method of refining and modification of fats and oils.
- ✓ Know about the nutritional aspects of fats and oils and their storage and handling.
- ✓ Gain information regarding entrepreneurship in food processing and knowledge of local processing industries.



## COURSE OUTCOMES

### MINOR/ ELECTIVE PHARMACEUTICAL AND MEDICINAL CHEMISTRY

### B. Sc. Third Year



## MINOR/ ELECTIVE

## PHARMACEUTICAL AND MEDICINAL CHEMISTRY

By the end of this course students will learn the following aspects of chemistry:

- ✓ Understand importance of pharmaceutical chemistry and pharmacopoeia.
- ✓ Learn intellectual property rights patents trademark and copyright.
- ✓ Understand definition classification of the drug with example and structures.
- ✓ Relate the structure and physical properties of drugs to their pharmacological activity.
- ✓ Explain you chemical properties related to QSAR.
- ✓ Describe the structure activity relation of some important class of drugs, overall process of drug discovery and the role played by medicinal chemistry in this process.



**COURSE OUTCOME  
CALENDAR  
LABORATORY COURSES B.Sc.  
SESSION 2024-25**

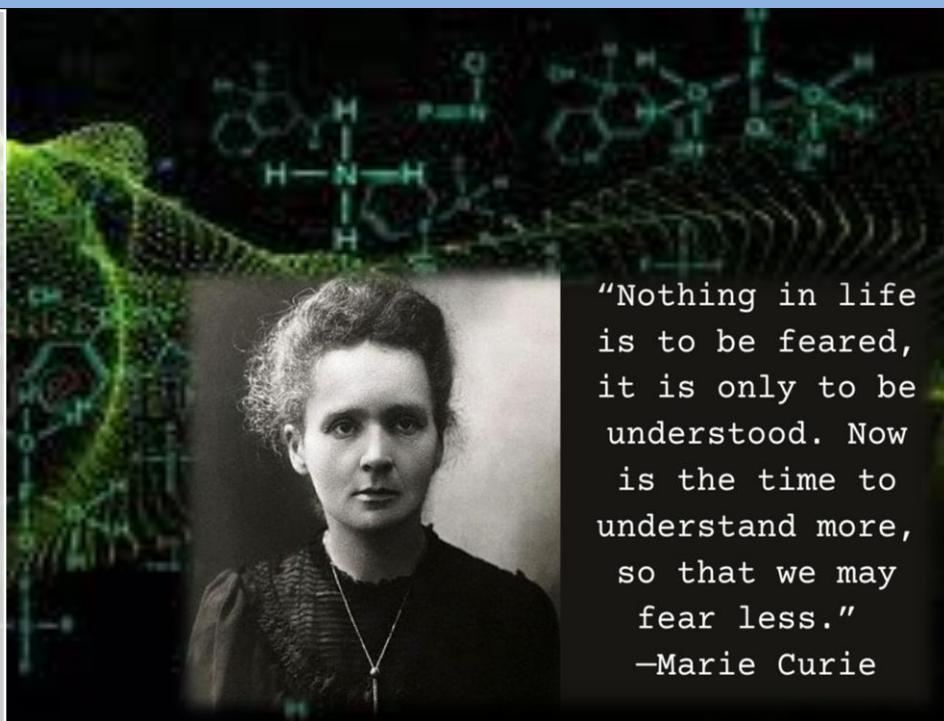
**DEPARTMENT OF CHEMISTRY  
GOVT. M. H. COLLEGE OF HOME SCIENCE AND SCIENCE  
FOR WOMEN, JABALPUR**



# COURSE OUTCOMES

## MAJOR PAPER 1 QUALITATIVE & QUANTITATIVE CHEMICAL ANALYSIS

### B. Sc. First Year



## LABORATORY COURSE: CHEMISTRY PRACTICAL MAJOR (PAPER I) - QUALITATIVE & QUANTITATIVE CHEMICAL ANALYSIS

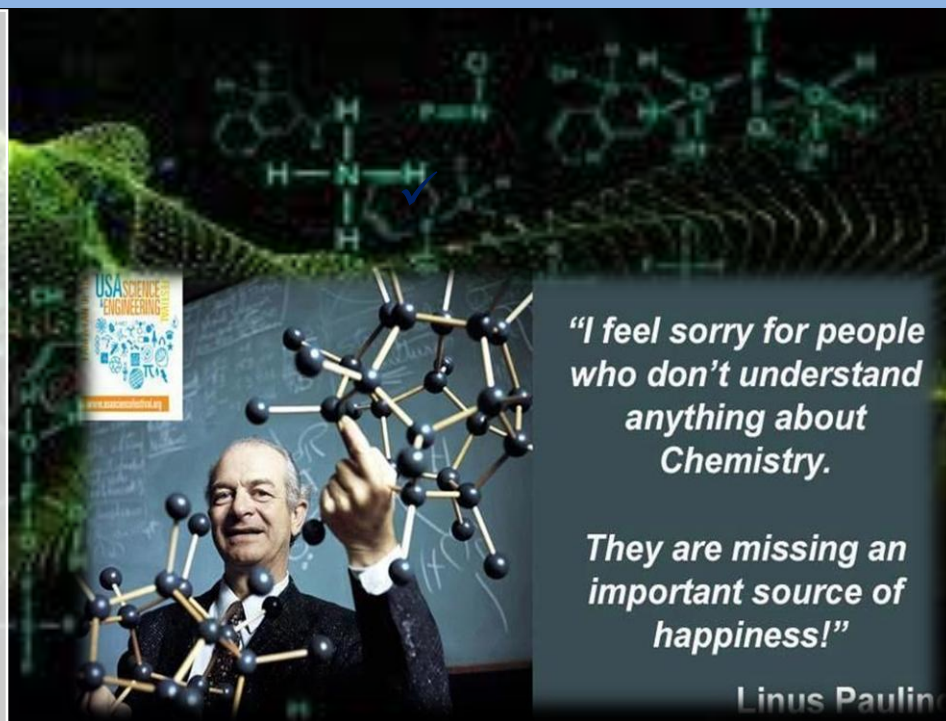
By the end of this course students will learn the following aspects of laboratory exercises in chemistry:

- ✓ Importance of chemical safety and lab safety while performing experiments in laboratory.
- ✓ Qualitative inorganic analysis.
- ✓ Elemental analysis of organic compounds (non-instrumental).
- ✓ Qualitative identification of functional group of organic compounds.
- ✓ Techniques of pH measurements.
- ✓ Preparation of buffer solutions.

## COURSE OUTCOMES

CORE COURSE /MINOR/ ELECTIVE  
ANALYTICAL PROCESSES AND TECHNIQUES

B. Sc. First Year



### CORE COURSE /MINOR/ ELECTIVE LABORATORY COURSE: CHEMISTRY PRACTICAL MAJOR (PAPER II) ANALYTICAL PROCESSES AND TECHNIQUES

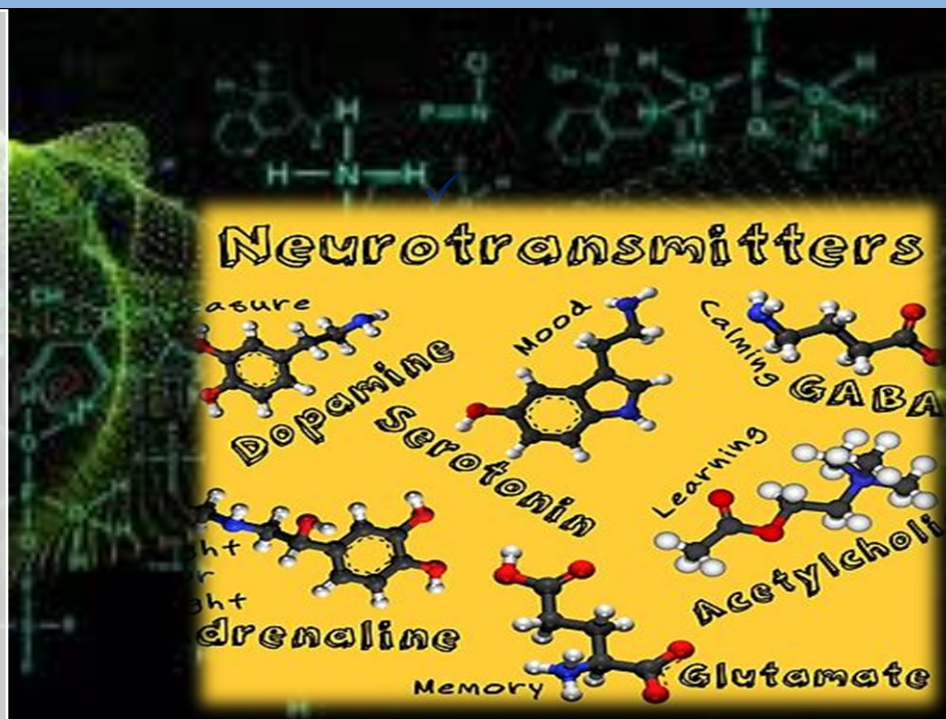
By the end of this course students will learn the following aspects of laboratory exercises in chemistry:

- ✓ Concepts and analytical methods in Chemistry
- ✓ Preparation of solutions of different concentrations.
- ✓ Standardization of the solution.
- ✓ Identification of Organic compounds by chromatographic techniques.
- ✓ Analysis by Spectral Techniques.

## COURSE OUTCOMES

### GENERIC ELECTIVE CHEMISTRY IN EVERYDAY LIFE

#### B. Sc. First Year



## LABORATORY COURSE: GENERIC ELECTIVE CHEMISTRY IN EVERYDAY LIFE

By the end of course students will learn the following aspects of laboratory exercises in chemistry

- ✓ Concepts and analytical methods in chemistry.
- ✓ Identification of acids, bases and salts involved in our day to day life.
- ✓ Methods to detect adulteration in commonly used food materials.
- ✓ Preparation of Natural indicator



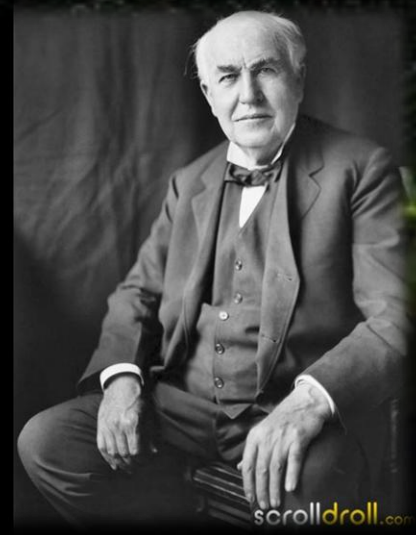
## COURSE OUTCOMES

### MAJOR PAPER 1 FUNDAMENTALS OF CHEMISTRY

#### B. Sc. Second Year

Genius is 1%  
inspiration and  
99% perspiration.

- *Thomas Edison*



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## LABORATORY COURSE: CHEMISTRY PRACTICAL MAJOR PAPER ORGANIC QUALITATIVE ANALYSIS, REACTIONS AND SYNTHESIS

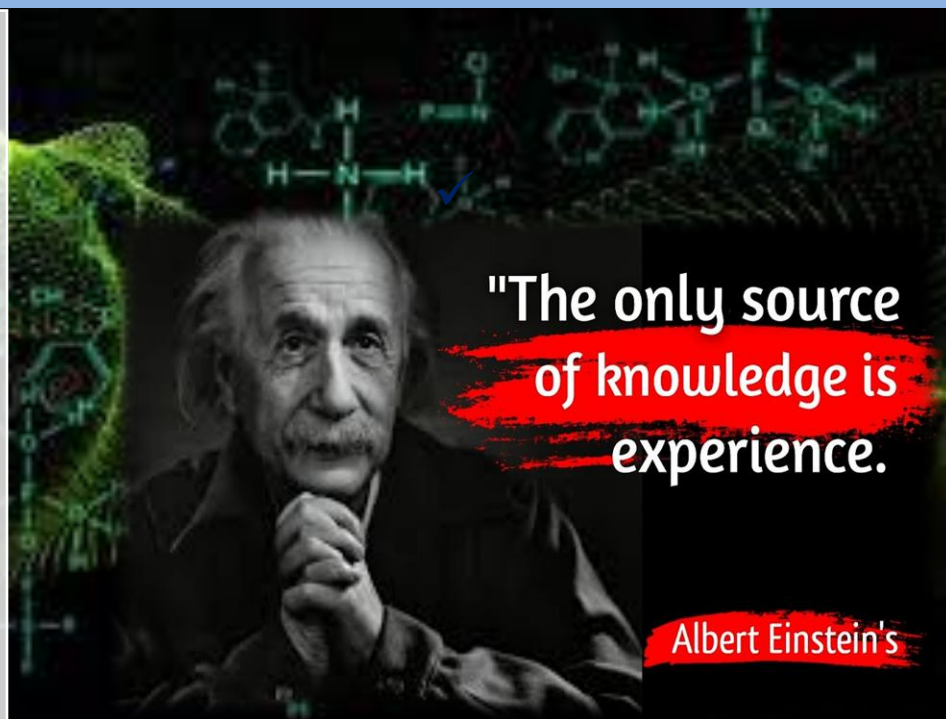
By the end of course students will learn the following aspects of laboratory exercises in chemistry -

- ✓ To perform various reactions, this will be helpful  
Understanding organic synthesis.
- ✓ To use reagents to perform organic reactions.
- ✓ To perform rearrangement reactions.
- ✓ To use chromatographic technique to monitor organic reactions.
- ✓ Applications of the reactions in the industries, e.g., pharmaceutical, polymer, pesticides, textile, dyes, etc. industries.
- ✓ These experiments will also be useful in further study and research work.

## COURSE OUTCOMES

CORE /MINOR/ELECTIVE  
INORGANIC & PHYSICAL CHEMISTRY

B. Sc. Second Year



## LABORATORY COURSE: CORE /MINOR/ELECTIVE METAL COMPLEX PREPARATION, THERMOCHEMICAL & PHASE EQUILIBRIA EXPERIMENTS

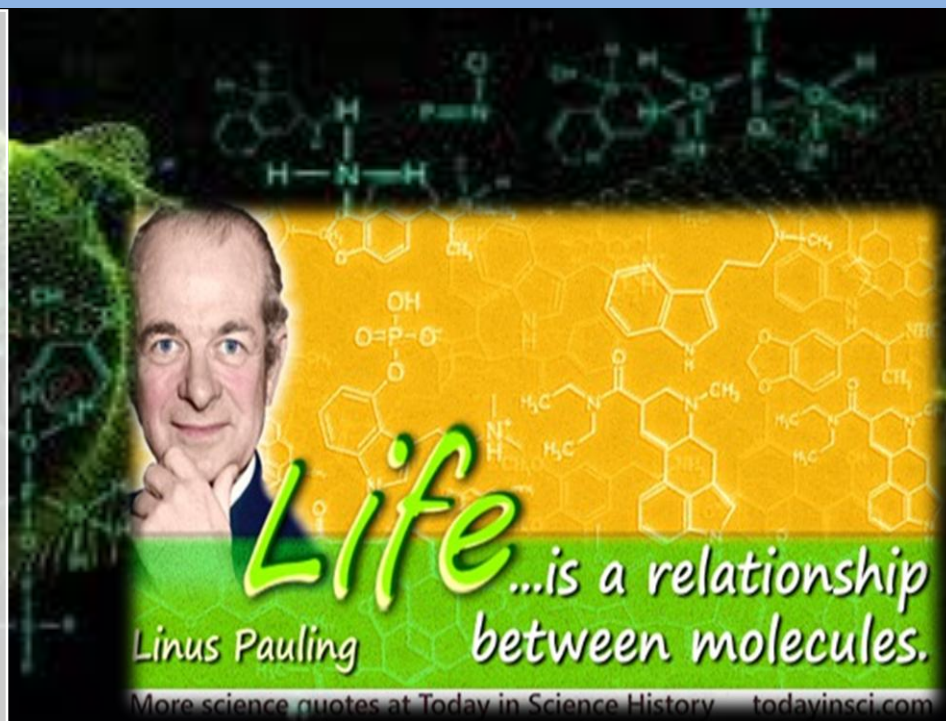
By the end of this course students will learn the following aspects of laboratory exercises of Chemistry:

- ✓ **Preparation of inorganic complexes.**
- ✓ **Use of calorimeter for thermo chemistry experiments.**
- ✓ **Determination of enthalpy of various system and reactions.**
- ✓ **Experiments on phase Equilibria.**
- ✓ **Construction of phase diagrams. Study of reaction equilibrium.**

## COURSE OUTCOMES

### MAJOR PAPER 1 INSTRUMENTAL TECHNIQUES IN CHEMISTRY

### B. Sc. Third Year



## MAJOR PAPER 1

### LABORATORY COURSE: INSTRUMENTAL ANALYTICAL TECHNIQUE IN CHEMISTRY

By the end of the course student will learn the following aspect of instrumental techniques in chemical analysis –

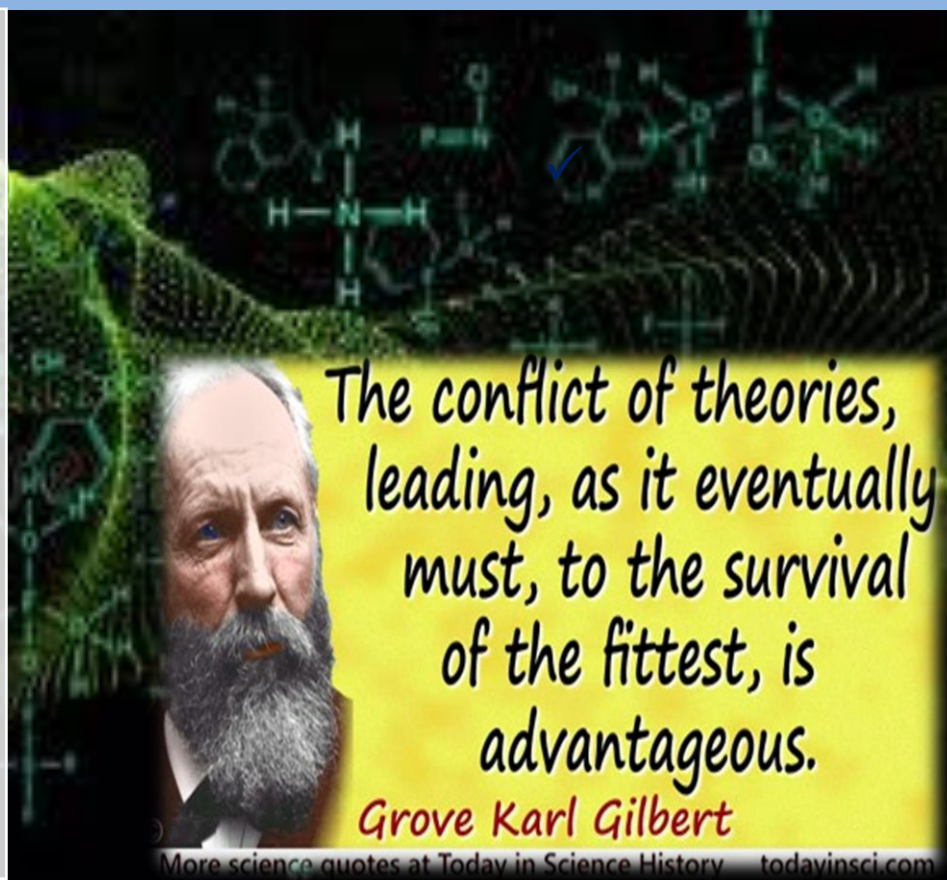
- ✓ Preparation of standard samples for analysis.
- ✓ Determination of concentration of solution spectrometrically.
- ✓ Determination of stoichiometry and stability constant and complexes.
- ✓ Potentiometric and conductometric titrations.
- ✓ Advance chromatography techniques.



## COURSE OUTCOMES

### MAJOR PAPER 2 SYNTHESIS AND ANALYTICAL TECHNIQUES

### B. Sc. Third Year



## LABORATORY COURSE

### SYNTHESIS AND ANALYTICAL TECHNIQUES

By the end of course students will learn the following aspects of laboratory exercises in chemistry

- ✓ How to synthesize ferrocene from ferric chloride.
- ✓ How to synthesis of potassium tries oxalate ferrate.
- ✓ How to determine pH of bio sample.
- ✓ How to determine sugar in blood sample by photometry.

## COURSE OUTCOMES

MINOR/ ELECTIVE  
PHARMACEUTICAL MEDICINAL CHEMISTRY

B. Sc. Third Year



Clemens Winkler

The world of chemical reactions is like a stage, on which scene after scene is ceaselessly played. The actors on it are the elements.

AZ QUOTES

## LABORATORY COURSE: MINOR/ ELECTIVE PHARMACEUTICAL MEDICINAL CHEMISTRY

On completion of this course the students will be able to understand –

- ✓ How to prepare acetanilide
- ✓ How to isolate the caffeine from the tea leaves.
- ✓ To learn about preparation of simple syrup as per IP and USP.
- ✓ Morphology of turmeric, Ginger and mentha.
- ✓ Preparation of suspension emulsion on it means in organic separations & pharmaceutical buffer solutions.