

**GOVT DR SHYAMA PRASAD MUKHERJEE SCIENCE & COMMERCE**

**COLLEGE, KOLAR ROAD BHOPAL M.P.**

Tele. No : 07552551837 | e-mail : [hegbscbho@mp.gov.in](mailto:hegbscbho@mp.gov.in) | website : [www.gscbhopal.in](http://www.gscbhopal.in)



**Govt. Dr. Shyama Prasad Mukherjee  
Science & Commerce college, Bhopal  
(M.P.)**

**COURSE OUTCOME**

**GOVT DR SHYAMA PRASAD MUKHERJEE SCIENCE & COMMERCE  
COLLEGE, KOLAR ROAD BHOPAL M.P.**

Tele. No : 07552551837 | e-mail : [hegbsccbho@mp.gov.in](mailto:hegbsccbho@mp.gov.in) | website : [www.gscbhopal.in](http://www.gscbhopal.in)



# SCIENCE

**B.Sc. Chemistry  
(Major)**

**Fundamentals Of  
Chemistry**

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

1. Ancient Indian chemical techniques.
2. Various theories and principles applied to reveal atomic structure.
3. Significance of quantum numbers.
4. Concept of periodic properties of elements.
5. Theories related to chemical bonding.
6. Acid-base concept, pH, buffer.
7. Factors responsible for reactivity of organic molecules.
8. Basics and mechanism of chemical kinetics.
9. Properties of electrolytes.

**B.Sc. Chemistry  
(Practical Major)**

**Qualitative &  
Quantitative  
Chemical Analysis**

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

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

**B.Sc. Chemistry  
(Minor)**

**BASIC ANALYTICAL  
TECHNIQUES**

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

1. Basic concepts of Mathematics for Chemists.
2. Fundamentals of analytical chemistry and steps involved in analysis.
3. Basic knowledge of Computer for chemists.
4. Basic Concepts of Chemical equilibrium.
5. Principles of Chromatography and chromatographic techniques.
6. Various techniques of Spectroscopic Analysis.

**B.Sc. Chemistry  
(Practical Minor)**

**ANALYTICAL  
PROCESSES &  
TECHNIQUES**

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

1. Concepts and analytical methods in Chemistry.
2. Preparation of solutions of different concentrations.
3. Standardization of the solution.
4. Identification of Organic compounds by chromatographic techniques.
5. Analysis by Spectral Techniques.





**B.Sc.  
Botany(Major)**

**Applied Botany**

By the end of this course the student should have:

- Understood the significance and role of botany.
- Learnt the basic aspects of applied botany.
- Gained knowledge about employment opportunities in field of botany
- Gained knowledge about start-up opportunities in the field of botany
- Learnt about opportunities of social services
- Gain knowledge about best health practices

**B.Sc.  
Botany(Practical  
Major)**

**Applied Botany  
Practical**

	the subject Botany, Biology, Life Science in class/12th/.
Course Learning outcomes (CLO)	On completion of this course, learners will be able to: By the end of this course the student should have knowledge of practical skill related with ethnobotany, tissue culture, application of bioinformatics software and tools of recombinant DNA technology.

**B.Sc.  
Botany(Minor)**

**Basic Botany**

- This course will help the student to understand the diversity of plants and evolutionary process in plant kingdoms.
- It gives an accounts of plant adaptations from aquatic condition to colonize terrestrial habitat.
- The changes in morphological, anatomical and reproductive structures that propel plant evolution can be investigated.
- The economic importance and significance of plants in nature will be understood.
- They will be acquainted with locally prevalent microbial diseases of plants and humans

**B.Sc.  
Botany(Practical  
Minor)**

**Basic Botany  
Practical**

- Students will learn to carry out practical work in the laboratory,
- Interpreting plant morphology and anatomy of various groups of lower and higher plants.
- Students will be able to identify the major groups of microorganisms.



**B.Sc.  
Zoology(Major)**

**Animal  
Diversity:Non-  
Chordata**

subject Biology in 12<sup>th</sup> Class

Upon completion of the course students should be able to

1. Learn about the importance of systemic, taxonomy and phylogeny to get a concrete idea of evolution of non-chordate phyla.
2. Understand the various morphological, anatomical structures and functions of animals of different phyla.
3. Get the knowledge about economic, ecological and medical significance of various animals in human welfare.
4. Understand the important parasites and their control measures.

**B.Sc. Zoology  
(Practical Major)**

**Invertebreta**

subject Biology in 12<sup>th</sup> Class

Upon completion of the course students should be able understand

1. Identify invertebrate animals of different phyla and their histology through study of museum specimens and slides
2. Learn their different systems through dissections
3. Enhance collaborative learning and communication skills through practical sessions, team work, group discussions, assignments and projects.



**B.Sc.  
Zoology(Minor)**

**Cell Biology,  
Reproductive Biology  
and Developmental  
Biology**

**B.Sc. Zoology  
(Practical Minor)**

**Cytology,  
Reproductive  
Biology and  
Embryology**

Upon completion of the course students should be able to

1. Develop deeper understanding of what life is and how it functions at cellular level
2. Understand the nature and basic concepts of Cell biology, Reproductive and Developmental biology
3. Understand structure and functions of cell membrane and cellular organelles
4. Understand the importance of latest reproductive trends, reproductive techniques to be applied for human welfare.
5. Understand the general patterns and sequential developmental stages during embryogenesis; and understand how the developmental processes lead to establishment of body plan of multi-cellular organisms.
6. Understand about the evolutionary development of various animals.

4

Upon completion of the course students should be able to understand

1. The different stages of mitotic and meiotic cell division and special types of chromosomes
2. Different stages of embryology
3. Through squash preparations understand the stages of cell division and structure of polytene chromosome
4. Enhance collaborative learning and communication skills through practical sessions, team work group discussion, assignments and project.



### B.Sc. Physics(Major)

### Thermodynamics & Statistical Physics

1. The course would enable the students to understand the basic Physics of heat and temperature in relation to energy, work, radiation and matter.
2. The students are expected to learn that “how laws of thermodynamics are used in a heat engine to transform heat into work”.
3. This course will also develop an understanding of the various concepts of statistics and the methods to apply them in thermodynamics.
4. Students will understand the importance of studying statistical mechanics with the behavior of particles under classical and quantum conditions.

### B.Sc. Physics (Practical Major)

### Thermodynamics & Statistical Physics Lab

1. The students would gain practical knowledge about heat and radiation by performing various experiments.
2. The students will acquire knowledge about the different forms of distribution of subatomic particles in the system using statistical methods.
3. The students will be able to use various thermodynamical instruments in daily life.

### B.Sc. Physics(Minor)

### Mechanics & General Properties of Matter

1. The course would empower the students to develop the idea about the behavior of physical bodies.
2. It will provide the basic concepts related to the motion of all the objects around us in daily life.
3. The students would be able to build foundation to various applied field in science and technology especially in the field of mechanical engineering.
4. The students will acquire the knowledge of basic mathematical methods to solve the various problem in physics.
5. The students will be able the understand the relativistic effect and the relation between energy and mass.

### B.Sc. Physics (Practical Minor)

### Mechanics & General Properties of Matter LAB

1. The students would acquire basic practical knowledge related to mechanics through the experiments.
2. Students will be familiar with various measurement devices by which they can measure various physical quantities with accuracy.
3. The students will develop the concept related to the mechanics and properties of matter.



**B.Sc. Mathematics  
(Major)**

**Algebra, Vector  
Analysis & Geometry**

The course will enable the students to:

1. Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix, using the rank of matrix.
2. To find the Eigen values and corresponding Eigen vectors for a square matrix.
3. Using the knowledge of vector calculus in geometry.
4. Enhance the knowledge of three dimensional geometrical figures (eg. cone and cylinder).

**B.Sc. Mathematics  
(Minor)**

**Calculus & Differential  
Equation**

The course will enable the students to:

1. Sketch curves in a plane using its Mathematical properties in the different coordinate systems of reference.
2. Using the derivatives in Optimization, Social sciences, Physics and Life sciences etc.
3. Formulate the Differential equations for various Mathematical models.
4. Using techniques to solve and analyze various Mathematical models.





## **B.Sc. Biotechnology (Major)**

## **Cell Biology & Biochemistry**

## **B.Sc. Biotechnology (Practical Major)**

## **Lab Work for Cell Biology & Biochemistry**

**Learning Outcome :-**At the end of the paper , a student should be able to :

1. Understand basics of cell biology.
2. Appreciate the importance of bonding and spatial arrangements of molecules for proper functioning and stability.
3. Understand both the physical as well as chemical properties of biomolecules
4. The Student Could Pursue a career in biochemical testing. The decrease of increase in the amount of some of the biomolecules can have clinical significance.
5. Students can also go in for medical Laboratory Technique Courses, opening opportunities in hospitals and pathological laboratories.

**Course Objective :-**The Main Objective of the course will be to give hands-on practical knowledge in Biotechnology. The Demand For Trained workforce in Biotechnology is ever growing in Fundamental Research and Industry Sector. Academic and Research Sectors also Require Interdisciplinary trained manpower to foster the Biotechnology Revolution. The curriculum aims to impart basic knowledge with emphasis on its applications to make the students ready for industries and research work in concerned field.

**Learning Outcome :-**At the end of the paper , a student will be able to :

1. Understand basic techniques of cell biology.
2. Know the physical as well as chemical properties of biomolecules
3. Pursue a career in biochemical testing. The decrease of increase in the amount of some of the biomolecules can have clinical significance.
4. Take medical Laboratory Technique Courses, opening opportunities in hospitals and pathological laboratories.

# GOVT DR SHYAMA PRASAD MUKHERJEE SCIENCE & COMMERCE COLLEGE, KOLAR ROAD BHOPAL M.P.

Tele. No : 07552551837 | e-mail : [hegbscbho@mp.gov.in](mailto:hegbscbho@mp.gov.in) | website : [www.gscbhopal.in](http://www.gscbhopal.in)



**B.Sc. Biotechnology  
(Minor)**

**Microbiology &  
Immunology**

**B.Sc. Biotechnology  
(Practical Minor)**

**Lab on Microbiology  
& Immunology**

**Course Objectives:** To create general understanding about microbiology and immunology

1. The students will be able to understand microbial diversity and Nutrition.
2. The students will be able to understand immune system, Immune responses and Vaccination.
3. The students will be able to describe role of immune system in both maintaining health and contributing to disease.
4. The students will be able to understand immunological techniques.

**Course Learning Outcomes:** At the end of the course student will familiar with -

1. Microbial diversity and nutrition.
2. Immune system, its properties and types.
3. Immunoglobulin structure, types and functions and can apply the concept of hypersensitivity and vaccination for different diseases.

**Course Learning Outcomes:**

On completion of this course, learners will be able to have sufficient scientific understanding of microbiology and immunology-

- 1 Students apply concept, Principle and types of sterilization methods viz performing microbiological experiments.
- 2 Students apply the concept and characteristics of antiseptic, disinfected and their mode of action in day to day life.
- 3 Students will apply principle, working and applications of instruments – Laminar airflow, Autoclave, Hot air oven etc



## B.Sc. Computer Science (Major)

### Computer System Architecture

**On completion of this course, learners will be able to:**

1. Understand the basic structure, operation and characteristics of digital computer.
2. Be able to design simple combinational digital circuits based on given parameters.
3. Familiarity with working of arithmetic and logic unit as well as the concept of pipelining.
4. Know about hierarchical memory system including cache memories and virtual memory.
5. Understand concept and advantages of parallelism, threading, multiprocessors and multicore processors.
6. Know the contributions of Indians in the field of computer architecture and related technologies.

## B.Sc. Computer Science (Major)

### Computer Architecture Lab

**On completion of this course, learners will be able to:**

1. Realization of the basic logic and universal gates.
2. Verify the behavior of logic gates using truth tables.
3. Implement Binary-to -Gray, Gray-to -Binary code conversions
4. Design half and full adder circuit using basic gates.
5. Design and construct flip flops and verify the excitation tables.



# GOVT DR SHYAMA PRASAD MUKHERJEE SCIENCE & COMMERCE COLLEGE, KOLAR ROAD BHOPAL M.P.

Tele. No : 07552551837 | e-mail : hegbsccbho@mp.gov.in | website : www.gscbhopal.in



## B.Sc. Computer Science (Minor)

## Programming Methodologies & Data Structures

## B.Sc. Computer Science (Minor)

## Office Tools & Programming Methodology Lab

### On completion of this course, learners will be able to:

1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles.
2. Writing efficient and well-structured computer algorithms/programs.
3. Learn to formulate iterative solutions and array processing algorithms for problems.
4. Use recursive techniques, pointers and searching methods in programming.
5. Will be familiar with fundamental data structures , their implementation; become accustomed to the description of algorithms in both functional and procedural styles
6. Have knowledge of complexity of basic operations like insert, delete, search on these data structures.
7. Possess ability to choose a data structure to suitably model any data used in computer applications.
8. Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc.
9. Assess efficiency tradeoffs among different data structure implementations.
10. Implement and know the applications of algorithms for searching and sorting etc.
11. Know the contributions of Indians in the field of programming and data structures.

### On completion of this course, learners will be able to:

1. Develop simple algorithms and flow charts to solve a problem with programming using top down design principles.
2. Writing efficient and well-structured computer algorithms/programs.
3. Learn to formulate iterative solutions and array processing algorithms for problems.
4. Use recursive techniques, pointers and searching methods in programming.
5. Possess ability to choose a data structure to suitably model any data used in computer applications.
6. Implementation of algorithms for searching and sorting.



**GOVT DR SHYAMA PRASAD MUKHERJEE SCIENCE & COMMERCE  
COLLEGE, KOLAR ROAD BHOPAL M.P.**

Tele. No : 07552551837 | e-mail : [hegbsccbho@mp.gov.in](mailto:hegbsccbho@mp.gov.in) | website : [www.gscbhopal.in](http://www.gscbhopal.in)



# ARTS



## **B.A. History(Major)**

### **Idea of Bharat**

Students will acquire knowledge regarding the primitive life and cultural status of the people of ancient India. They can gather knowledge about the society, culture, religion and political history of ancient India. They will also acquire the knowledge of changing socio-cultural scenarios of India. By studying this paper, students will get to know the golden past of India and feel proud of themselves.

## **B.A. History (Minor)**

### **History of Ancient India from Early to 1205**

The students will learn to analyze the various stages of evolution and development of man in the Prehistoric, Protohistoric and Historic Age. To have an in depth knowledge about the ancient civilizations of India like Indus-Saraswati Civilization, Vedic civilization, Later Vedic Civilization etc. and compare them with the other contemporary civilizations of the world. To explain in detail about golden past of India during the Mauryan and Gupta period, their conquests, art, architecture and literature, etc. They will be able to write meaningful essays on the brave and courageous Rajput clans and the South Indian dynasties of India.





## B.A. Sociology(Major)

### Indian Society & Culture

इस पाठ्यक्रम से छात्रों को भारतीय समाज की अवधारणा, कार्य और दैनिक जीवन से परिचित कराने की आशा है। यह छात्रों के समक्ष भारतीय समाज का एक व्यापक, एकीकृत और अनुभवजन्य चित्र प्रस्तुत करेगा :

1. इस पाठ्यक्रम से विद्यार्थियों को भारतीय समाज की मूल संरचना के बारे में एक धारणा मिलेगी, इसके ऐतिहासिक आधार, समाज और संस्थानों की बुनियादी दार्शनिक नींव सम्बन्धी अंतर्दृष्टि मिलेगी।
2. इस पाठ्यक्रम की सहायता से विद्यार्थियों में भारतीय परम्पराओं की व्यापक समझ विकसित होगी, जो वर्तमान समय में हमारे समाजीकरण से विलुप्त है।
3. इस पाठ्यक्रम के द्वारा विद्यार्थी भारतीय समाज के तीन स्तर: अरण्यक, लोक (ग्राम्य) और नगर के बारे में भी विस्तार से जानकारी प्राप्त करेंगे।
4. यह पाठ्यक्रम विद्यार्थियों के भविष्य में विभिन्न स्थानीय/क्षेत्रीय रोजगार के संसाधनों को चूने में मदद करेगा।

## B.A. Sociology (Minor)

### Basic Concepts of Sociology

1. The course is designed to incorporate all the key concepts of Sociology which would enable the learner to develop keen insight to distinguish between the commonsense knowledge and Sociological knowledge.

2. The conceptual learning of Society, Social groups, Social structure, Social institution etc, will help students in their day to day living.

3. By studying this paper students will get information about various employment opportunities in government, corporate, N.G.O. and self employment sector.

4. This paper gives students an awareness of cultural differences and provides them with opportunity to enhance their cultural sensitivity.

5. The concepts of Indian social institutions, such as, family, Marriage, Kinship will enable students to consider their roles in solving many social problems.

6. The theory of cultural lag will make students better understand the conflict of generational gap and minimize it in due course.

7. Teaching of culture, socialization and civilization will emphasise not only the new agencies of socialization but also their significance in personality development.



**B.A.  
Economics(Major)**

**Micro Economics**

After completing this course, students will be able to understand rational behaviour and fundamentals of microeconomics. They will be able to explain consumer's and producer's behaviour and their optimum decisions. Students will be able to know about the firms and industry, markets and their decisions about optimum production. They will be also able to explain the theory of distribution and concept of economic welfare. Learning microeconomics is an excellent way to gain an understanding of many factors that affect us in the real-world, such as methods of buying goods, product pricing and input pricing. Ultimately, learning microeconomics is key in learning about the principles of economics.

**B.A.  
Economics (Minor)**

**Micro Economics**

After completing this course, students will be able to sharpen the analytical skills by highlighting on broad overview of the Indian economy. They will be familiar with the issues related to Agriculture, Industry, Foreign Trade, Economic Planning and various Economic Problems of India. Students will be acquainted with broad overview of Madhya Pradesh Economy. They will be able to develop, analyse and interpret events and issues related to Indian Economy.





## B.A. Political Science(Major)

### Political Theory

1. Student will be able to understand meaning and significance of Political theory, different ideologies and approaches.
2. They will be able to explain concept of state and its changing nature.
3. They will learn what is power and authority and how they are interwoven. These two concepts will further enhance their understanding of politics.
4. They will be able to learn different dimensions of sovereignty and its relation with state.
5. They will be able to explain liberty, equality, justice and rights. Understanding of these key political concepts will facilitate students in real political world.
6. They will be able to explain different models of democracy and theories of representation.

## B.A. Political Science(Minor)

### Indian Constitution

1. Students will be able to understand the constitutional development in India.
2. They will be able to answer how constituent assembly was formed.
3. They will be able to describe the significance of the Preamble, Fundamental rights and Directive Principles of State Policy in the constitutional design of India.
4. They will be able to answer questions pertaining to the function and role of the President, Prime Minister, Governor, Chief Minister, Parliament and State legislature, and the courts in the Constitutional design of India.
5. They will be able to identify the power division in constitutional setup.



## **B.A. Geography (Major)**

### **Human Geography: Environment & Culture**

After the completion of course, the students will be able to:

- i. Discuss and describe the major concepts and key principles of Human Geography including place, space, scale and landscape.
- ii. Appreciate the diversity of the cultural backgrounds and places.
- iii. Approach problem solving from a geographic perspective by understanding the role location plays.

## **B.A. Geography (Practical Major)**

### **Cartographic Techniques**

After the completion of course, the students will be able to:

- i. Develop hands on skills in diagrammatic representation of data.
- ii. Comprehend thematic mapping techniques, its cartographic representation and interpretation.
- iii. Take up Cartography as a profession.



## **B.A. Geography (Minor)**

### **Physical Geography: Lithosphere (Geomorphology)**

After the completion of course, the students will have ability to:

- i. Understand the internal structure of the earth, rocks that compose it and forces within the earth that act to deform it.
- ii. Learn about the contribution of ancient Indian scholars in the development of Physical Geography.
- iii. Analyze how the natural and anthropogenic operating factors affect the development of land forms.
- iv. Understand about the denudation processes that unceasingly act at the earth's surface to shape land forms and reduce relief.
- v. Assess the role of structure, stage and time in shaping the land forms.

## **B.A. Geography (Practical Minor)**

### **General Cartography**

After the completion of course, the students will have ability to:

- i. Understand the internal structure of the earth, rocks that compose it and forces within the earth that act to deform it.
- ii. Learn about the contribution of ancient Indian scholars in the development of Physical Geography.
- iii. Analyze how the natural and anthropogenic operating factors affect the development of land forms.
- iv. Understand about the denudation processes that unceasingly act at the earth's surface to shape land forms and reduce relief.
- v. Assess the role of structure, stage and time in shaping the land forms.



**GOVT DR SHYAMA PRASAD MUKHERJEE SCIENCE & COMMERCE  
COLLEGE, KOLAR ROAD BHOPAL M.P.**

Tele. No : 07552551837 | e-mail : [hegbsccbho@mp.gov.in](mailto:hegbsccbho@mp.gov.in) | website : [www.gscbhopal.in](http://www.gscbhopal.in)



# COMMERCE





## B.Com

### Business Organization & communication

After completion of this course it is expected that the student shall understand the basics of the business and will be able to imbibe how any business can be organized successfully. The chapters related to communication shall be able to elucidate how communication plays an important role in modern business scenario.

## B.Com

### Financial Accounting

**Successful completion of this course, the student will be able to:**

- Acquire conceptual knowledge of basics of accounting
- Identify events that need to be recorded in the accounting records
- Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP
- Describe the role of accounting information and its limitations
- Equip with the knowledge of accounting process and preparation of accounts of a sole trader
- Identify and analyze the reasons for the difference between cash book and pass book balances
- Recognize circumstances providing for increased exposure to errors and frauds



**B.Com**

**Bussiness  
Mathematics**

**Successful completion of this course, the student will be able to:**

- Acquire conceptual knowledge of basics of accounting
- Identify events that need to be recorded in the accounting records
- Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP
- Describe the role of accounting information and its limitations
- Equip with the knowledge of accounting process and preparation off in a accounts of sole trader
- Identify and analyze the reasons for the difference between cash book and pass book balances
- Recognize circumstances providing for increased exposure to errors and frauds



**GOVT DR SHYAMA PRASAD MUKHERJEE SCIENCE & COMMERCE  
COLLEGE, KOLAR ROAD BHOPAL M.P.**

Tele. No : 07552551837 | e-mail : [hegbsccbho@mp.gov.in](mailto:hegbsccbho@mp.gov.in) | website : [www.gscbhopal.in](http://www.gscbhopal.in)



# HOME SCIENCE





## **B.Sc. Home Science (Major)**

### **Food & Nutrition**

Nutrition is the prime necessity of life. In this subject the students will study about different nutrients, their functions, deficiency and effect of excess intake on body. , he will also aquinted with low cost and high nutritive value foods preparations.The students will be able to:

1. Explain the Basic nutritional concepts.  
Understand role of different nutrients in body
2. Identify food groups and sources of nutrient
3. Understand nutritional aspects and orient towards subject related job programs
4. Will also aquinted with low cost and high nutritive value foods and to combat malnutrition in society.

## **B.Sc. Home Science (Practical Major)**

### **Dietary Principals & Participations**

On completion of this course , the students will be able to:

1. Explain the Basic nutritional concepts.
2. Identify nutrients in foods and food groups
- 3..Able to prepare low cost high nutritive value recipes and thereby help in combating malnutrition



## **B.Sc. Home Science (Minor)**

### **Fundamentals of Textiles**

A successful completion of this course will enable students to:

1. Understands and define the key textile terms.
2. Describe textile fibres in terms of their production and properties.
3. Understand production techniques and properties of yarns.
4. Explain various methods of fabric construction and relate them to specific uses keeping in mind fabric properties.
5. Recall various dyeing, printing and finishing techniques.

## **B.Sc. Home Science (Practical Minor)**

### **Fundamentals of Textiles**

**On completion of this course, learners will be able to:**

1. Develop the skills for identification of fibers and fabrics.
2. Understands the fabric construction techniques by preparing samples of various types of weaves.
3. Learn the methods of dyeing and printing of fabrics.