S.S.D. Girls' College, Bathinda

Multidisciplinary Course Based On NEP-2020

B.Sc. / B.Sc. (Honours)

Session: 2025-26

SYLLABUS

B.Sc. (Med.) Part-I (SEMESTER-I)

SUBJECT: MAJOR BOTANY - CELL BIOLOGY AND GENETICS

Paper Code: BM102

Total Marks: 70
Theory Marks: 50 marks
hours/week
Internal Assessment: 20 marks
Pass Marks: 35%

Time Allowed: 3 hours
Total Teaching hours: 3

Credit: 3

INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions each from the respective section of syllabus out of which the student will be required to attempt two questions from each section. Each question will carry 8 marks. Section C will be compulsory with 9 short-answer type questions of 02 marks each which will cover the entire syllabus.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C, which is compulsory.

Section-A

1. Structural organization of cell: Prokaryotic and Eukaryotic cells; Plant and Animal cells. Structure and function of cell organelles: Mitochondria, Plastids, Endoplasmic reticulum, Ribosomes, Golgi Bodies, Lysosomes, Vacuoles and Peroxisomes
2. The cell envelops: Structure, composition and functions of cell wall in Bacteria, fungi and plants. Plasma membrane: Structure and function; various models proposed, fluid mosaic model; transport across membrane.
3. Structure and function of nucleus: organization of nuclear membrane, nucleolus and chromosomes.
4. Genetic material: Structure of DNA and RNA, elucidation of DNA and RNA as genetic materials. Organisation of DNA into chromosomes, nucleosome structure. Organisation of Genetic material in eukaryotes, prokaryotes and viruses.

Section – B

5. Replication of DNA in prokaryotes and eukaryotes, Mitosis and Meiosis
6. Transcription and Translation in eukaryotes and Prokaryotes, genetic code.
7. Mutations – spontaneous and induced; Chromosome alterations – deletions, duplication, translocation, inversions. Variations in chromosome number -- aneuploidy, polyploidy.
8. Genetic inheritance: Mendelism; laws of segregation and Independent Assortment; linkage analysis; allelic and non-allelic interactions.

S.S.D. GIRL's COLLEGE, BATHINDA

Multidisciplinary UG (Chemistry)
B.Sc. / B.Sc. (Honours)
Session 2025-2026
B.Sc. (Medical) Part-1, Sem-1
Chemistry Major-I
Paper Code: BM103

Max Marks: 70
External Semester Exam: 50
Internal Assessments: 20
Passing Marks:35%

Credits: 03
Time allowed: 3 Hrs.

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections, namely, Section A. B and C. Section A and B will have four questions from the respective section of syllabus. Each question will carry 08 marks and may be segregated into sub-parts. Section C will be compulsory with 09 short-answer type questions of 02 mark each covering the entire syllabus.

INSTRUCTIONS FORSTUDENTS

Students are required to attempt five questions selecting two questions from each of Section A & B while Section-C is Compulsory.

Section A

Atomic Structure

Idea of de-Broglie matter waves, derivation of de- Broglie equation, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, the significance of y and y^2, quantum numbers, radial and angular wave functions (excluding mathematical relations), probability distribution curves in terms of R(r) *vs* r and R(r) *vs* r^2 (for Is, 2s 3s and 2p, 3p, 4p subshells), shapes of *s, p, d* orbitals. Aufbau and Pauli exclusion principles, Hund's rule of multiplicity. Electronic configurations of the elements and ions (Atomic number up to 30).

Periodic Properties

Position of elements in the periodic table; effective nuclear charge and its calculations, atomic and ionic radii, ionization energy, electron affinity, and electronegativity -definition, trends in the periodic table.

Structure and Bonding

Hybridization, Bond length and bond angles, Bond Energy, Localized and Delocalized chemical bond, Van der Waal's interaction (dipole-dipole; dipole-induced dipole; induced dipole - induced dipole interactions), Resonance, Hyperconjugation, Inductive and Hydrogen Bonding.

Ishita Garg SH VK

Reaction Intermediates

Curved arrow notation, Drawing electron movements with arrows, half-headed and double headed arrows, hemolytic and heterolytic bond breaking, Types of reagents (Types, structure and stability)- Electrophiles and Nucleophiles, Reactive intermediates Carbocations, Carbanions, Free Radicals.

Section - B

Alkanes

Structure, IUPAC Nomenclature, and Isomerism. Methods of Preparation (from alkyl halide, Wurtz reaction, Corey-House synthesis), Physical properties, Halogenation of alkanes and its mechanism -Relative reactivities of halogens, and different classes of hydrogen atoms; Reactivity, and Selectivity.

Chemical Kinetics-I

Chemical kinetics and its scope, Rate of a reaction, factors influencing the rate of a reaction (qualitative analysis only) - concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions- zero order, first order, second order, pseudo-order, half-life, and mean life. Determination of the order of reaction - differential method, method of integration, method of half-life period, and isolation method. Radioactive decay as a first-order phenomenon (only numerical).

Chemical Kinetics-II

Theories of Chemical Kinetics, Effect of temperature on rate of reaction, Arrhenius equation (without derivation), concept of activation energy (graphical representation for exothermic and endothermic reactions). Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant.

Course Outcomes

- Gain in-depth knowledge and understanding of core concepts in Chemistry.
- Acquire laboratory and fieldwork skills, including data collection, analysis, and interpretation.
- Prepare for further studies (like M.Sc., competitive exams) or employment in education, research, industry, or government.

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Session: 2025-26

SYLLABUS

B.Sc. (Med.) Part-I (SEMESTER-I)

SUBJECT: MAJOR ZOOLOGY - ANIMAL DIVERSITY (PROTOZOA TO CHORDATA)

Paper Code: BM101

Max Marks: 70
Pass Marks: 35%
Theory Paper: 50
Internal Assessment: 20 marks

Total Teaching hours: 3 Hrs/week
Time Allowed: 3 hours
Paper Code: BM101
Credit: 03

INSTRUCTION FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C, Section A and B will have four questions each from the respective section of syllabus and will carry 8 marks each. Section C will consist of 9 short-answer type questions (8-10 lines) which will cover the entire syllabus uniformly and will carry 2 marks in all.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C, which is compulsory.

Section-A

1. **Phylum Protozoa:** General characters; Reproduction in Protozoa.
2. **Phylum Porifera:** General characters; Canal System in *Sycon*.
3. **Phylum Coelenterata:** General characters; Polymorphism in *Obelia*.
4. **Phylum Platyhelminthes:** General characters: Life history of *Taenia solium*.
5. **Phylum Nemathelminthes:** General characters: Life history of *Ascaris lumbricoides* and its parasitic adaptations
6. **Phylum Annelida:** General characters; Excretion in Annelida
7. **Phylum Arthropoda:** General characters; Respiration in Prawn and Cockroach, Metamorphosis in Insects
8. **Phylum Mollusca:** General characters
9. **Phylum Echinodermata:** General characters; Water-vascular system in Asteroidea

Section-B

10. **Protochordates:** General features
11. **Agnatha:** General features of Agnatha (Cyclostomata)
12. **Pisces:** General features; Migration and Osmoregulation in Fishes
13. **Amphibia:** General features; Parental Care, Neoteny and Paedogenesis
14. **Reptilia:** General features; venomous and non-venomous snakes, Biting mechanism in snakes and Poison apparatus
15. **Aves:** General features; Flight adaptations in birds
16. **Mammalia:** General features, Origin of mammals

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Session: 2025-26

SYLLABUS

B.Sc. (Med.) Part-I (SEMESTER-I)

SUBJECT: SEC - VERMICULTURE AND VERMICOMPOSTING TECHNOLOGY

Paper Code: BM108

Total Marks: 100
Theory Marks: 50
Viva: 20
Internal Assessment: 30
Pass Marks: 35%

Time Allowed: 3 hours
Total Teaching hours: 2 hours/week
Credit: 3

INSTRUCTION FOR THE PAPER SETTER

The End Semester examination will be of 3 hours duration. The question paper will consist of three sections: Section A, B and C.
Section A and B will have eight questions each from the respective sections of the syllabus out of which the candidate will be required to attempt four questions each. Each question will carry 10 marks.
Section C will be compulsory with five short-answer type questions of 02 marks each which will cover the entire syllabus.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt any two questions from each Section A and B and the entire Section C, which is compulsory.

Section-A

1. Introduction to Vermiculture: Definition, its value in maintenance of soil structure and role as four R's of recycling – reduce, reuse, restore.
2. Classification, habit, habitat, morphology of Pheretima posthuma: Useful, local and exotic species of earthworms.

Section – B

3. Process of Vermicomposting: Material required, bed preparation, inoculation of earthworms, precautions and best practices, harvesting, processing vermiwash, benefits and uses of compost. Different Methods of Vermicomposting: Small- and large-scale bed method, pit method, vermicompost pots, earthworm farming for home gardens, conventional commercial composting at larger scale.
4. Problems in Vermicomposting: Pests and diseases, earthworms' frequent problems, preventive methods. Vermiculture, vermicompost economy, entrepreneurship.