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
Internal Assessment: 20 marks
Pass Marks: 35%

Time Allowed: 3 hours
Total Teaching hours: 3 hours/week
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.

Course Outcomes

1. Students will be able to understand the concept of the structure and purposes of basic components of Prokaryotic and Eukaryotic cells.
2. To impart knowledge to students about ultra structure and functions of cells organelles.
3. They will understand the structure and functions of genetic material.

RECOMMENDED READINGS

1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K. and Walter, P.2008. Molecular Biology of the Cell, 5th Edition. Garland Science Taylor & Francis Group, USA.
2. Gupta, P.K.2014. Cytogenetics. Rastogi Publications, Meerut.
3. Singh, B.D. 2006. Genetics. Kalyani Publishers, NewDelhi.
4. Singh, R.J. 2017.Plant Cytogenetics, 3rd Edition. CRC Press.

Multidisciplinary Course Based On NEP-2020

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

B.Sc.-I (Med.) Part-I Semester-I Major Botany

2025-26 Syllabus

Practical Paper: Cell Biology and Genetics

Practical Paper Code: BM102P

Total Marks: 30
Practical Marks: 20 marks
Internal Assessment: 10 marks
Pass marks: 35%

Time Allowed: 3 hours
Total Teaching hours: 2 hours/week
Credit: 1

SUGGESTED LABORATORY EXCERCISES

Teachers may select plants/material available in their locality/institution.

1. To study cell structure from onion leaf peels.
2. Examination of electron micrographs of eukaryotic cells with special reference to organelles.
3. Examination of various stages of mitosis and meiosis using appropriate plant material (e.g. onion root tips, onion flower buds).
4. Preparation of Karyotypes from dividing root tip cells of *Allium*.
5. Study of pollen mitosis of *impatiens balsamina*.
6. Study of special types of chromosomes from slides/photographs.
7. Working out the Mendelian laws of inheritance using seed mixture /data provided.

INSTRUCTIONS FOR PAPER SETTER

1. Preparations of squash mount to show a cell division stage from onion root tip/flower.
2. Experiment on laws of inheritance using seed mixtures.
3. Preparation of temporary slide of onion peels to study cell structure.
4. Identification of three slides/Electron microphotographs.
5. Practical Note Book.
6. Viva-voce.

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

Session: 2025-26

SYLLABUS

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

SUBJECT: MAJOR BOTANY – DIVERSITY OF MICROBES

Paper Code: BM202

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

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

INSTRUCTIONS TO 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. Viruses: General characters, structure, classification and replication of viruses; importance of viruses, a brief account of Mycoplasma.
2. Bacteria-A general account with particular reference to ultra-structure, classification, mode of reproduction. A brief account of Archaebacteria.
3. Nutritional types in bacteria, economic importance of viruses and bacteria.
4. General account of Cyanobacteria: thallus organization, photosynthetic pigments, reserve food material & multiplication with emphasis on *Oscillatoria*.

SECTION-B

5. Fungi and Fungi like organisms: General characters. Classification and economic importance. Important features and life history of members of Kingdom Chromista: *Phytophthora* and Protozoa: *Stemonitis.*
6. Important features and life history of members of Kingdom Fungi: Chytridiomycota-*Physoderma*; Zygomycota-*Mucor*; Ascomycota-*Saccharomyces, Pencillium* and *Peziza*.
7. Important features and life history of Basidiomycota and Mitosporic Fungi: *Puccinia, Ustilago, Agaricus*; *Cercospora, Colletotrichum.*
8. Lichens: Structure, morphology, reproduction and economic importance.

Course Outcomes

1. To study and impart knowledge about the general characteristics, structure, reproduction, life history and economic importance of fungi.
2. To understand the features of Lichens, Viruses and Bacteria.
3. A general account of mycoplasma, mycorrhiza and cyanobacteria.

RECOMMENDED READINGS

1. Alexopolus, C.J., Mims, C.W. and Blackwell, M. 1996. *Introductory Mycology*. John Willey & Sons. Inc., Singapore.
2. Dube, H.C.1990. *An Introduction to Fungi*. Vikas Publishing House Pvt. Ltd., New Delhi.
3. Sharma, P.D. 2001. *The Fungi*. Rastogi Co., Meerut.

Multidisciplinary Course Based On NEP-2020

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

Session: 2025-26

SYLLABUS

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

PRACTICAL PAPER: DIVERSITY OF MICROBES

Paper Code: BM202P

Max Marks:30
Practical Marks:20
Internal Assessment:10

Total Teaching Hrs.: 2 Hrs Per Week
Time Allowed: 3 Hrs.
Credit: 01

SUGGESTED LABORATORY EXCERCISES

Teachers may select plants/material available in their locality/institution.

1. Study of the genera included under Blue-Green algae and fungi indicating their systematic position.
2. Observation of disease symptoms in hosts infected by bacteria – (Citrus canker), fungi – (Late blight of potato, loose smut of wheat, brown rust of wheat, yellow stripe rust of wheat, tikka disease of groundnut, red rot of sugarcane), viruses – (Yellow vein mosaic of bhindi) and mycoplasma – (little leaf disease of brinjal). Examination of diseased material and identification of pathogens.
3. Gram staining of bacteria.
4. Study of crustose, foliose and fruiticose lichen thalli.

INSTRUCTIONS FOR PAPERSETTER

1. Identification, classification and morphological note on specimens from Algae, Fungi, Lichens.
2. Study of diseased plant material.
3. Practical notebook.
4. Viva-voce.