

St. Aloysius College (Autonomous) Jabalpur
B.Sc I (2009-10)
Botany Syllabus
Semester- I
Course- Diversity of Microbes and Cryptogams
PAPER-I

MM. 35

Unit-1

Viruses and mycoplasma: characteristics of viruses and mycoplasma, general account of TMV and T4 bacteriophage.

Unit-2

Bacteria: structure, nutrition, reproduction and economic importance; general account of cyanobacteria.

Unit-3

Algae; general characters, classification and economic importance; important features and life history of Chlorophyceae – Volvox, Oedogonium; Charophyceae-Chara.

Unit-4

Algae Xanthophyceae – Vaucheria; **Phaeophyceae** –Ectocarpus, Sagassum; **Rhodophyceae** – Polysiphonia.

Unit-5

Fungi: general character, classification and economic importance; Important features and life history of Mastigomycotina- Phytophthora; Zygomycotina - Mucor.

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Botany Syllabus
Semester- I
Course- Cell Biology and Genetics
Paper- II

MM. 35

Unit-1

The Cell envelops; plasma membrane; bilayer lipid structure; functions of the cell Wall.

Unit-2

Structure and function of cell organelles: Golgi, ER, peroxisomes, Vacuoles Chloroplast mitochondria.

Unit-3

Structure and function of nucleus: Ultra structure: Nuclear membrane; Nucleolus. extranuclear genome; presence and function of mitochondrial and plastid DNA, Plasmids

Unit-4

Chromosome organization; Morphology; Centromere and telomere, special types of chromosomes, mitosis, meiosis

Unit-5

Variations in chromosomes structure: Deletions, Duplications, Translocations, Inversions; Variation in Chromosome number, Aneuploidy, Polyploidy.

Books:-

- 1 G.M.Smith 1971 Cryptogunle Botany. Vol I. Algae & Fungi Tata McGraw Hill Pub. Co.New Delhi.
- 2 G.M.Smith 1971 Cryptogunle Botany. Vol II. Bryophytes & Pteridophytes. Tata McGrew Hill Pub. Co.New Delhi.
- 3 O.P.Sharma 1992 Text book of Thallophytea. McGrew Hill Pub. Co.
- 4 O.P.Sharma 1990 Text book of Pteridophyta. Mcmillan India ltd.
- 5 P.D.Sharma 1991. The Fungi Rastogi & Co.Meerut.
- 6 H.C.Dubey 1990 Anintroduction of fungi. Vikas Pub.house pvt.
- 7 P.Puri 1980 Bryophyta Atma Ram & Sons ,Delhi.
- 8 A.Clifton 1958 introduction to the Bacteria McGrew Hill Pub. Co.New Delhi.
- 9 Alberts B.D.Lewis, J.Raff, M.Ruberts, K. and Watson I.D. 1999 Molecular Biology of Cell Garland Pub. Co.Inc. New York, USA.
- 10 Atherly,A.G., Girton, J.R. and McDonald, J.F. 1999 the Science of Genetics, Saunders College Pub. Fort Worth, USA.

- 11 P.K.Gupta 1999 A text Book of Cell and Molecular Biology, Rastogi Pub. Meerut India.
- 12 Kleinsmith L.J. and Kish V.M. 1995 Principles of Cell and Molecular Biology (2nd edition) Harper Collins College pub. New York USA.
- 13 P.K.Gupta Gentic's Rastogi Pub. Meerut.
- 14 Sinha & Sinha cytogenetics & plant Breeding Vikas Pub.

PRATICAL WORK

1. Study of the genera include under algae and fungi.
2. observation of diseases symptoms in hosts infected by, viruses and mycoplasma. Section cutting of diseased material and identification of the pathogens as per the theory syllabus.
3. Gram staining of bacteria.
4. Study of crustose, foliose and other type of lichen thalli.
5. To study cell structure from onion leaf peels: demonstration of staining and mounting methods.
6. Comparative study of cell structure in onion cells. Hydrilla and Spirogyra. Study of cyclosis in Tradescantia staminal cells.
7. Study of plastids to extreme pigment distribution in plants (e.g. Cassia, Lycopersicon and Capsicum).
8. Examination of electron micrographs of eukaryotic cells with special reference organelles.
9. Study of electron micrographs of viruses, bacteria, cyno bacteria and eukaryotic cells for comparative cellular organization.
10. Examination of various stages of mitosis and meiosis using appropriate plant material (e.g. onion root tips, onion flower buds).
11. Cytological examination of special type of chromosomes: bar body, lambrush and polytene chromosomes.

SCHEME OF PRATICAL EXAMINATION

SEMISTER I

Algae / Fungi - 10
Mitosis / Meiosis - 10
Plant diseases - 10
Spotting - 10
Project - 05
Sessional - 05

TOTAL 50

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Botany Syllabus
Semester- II
Course- Diversity of Microbes and Cryptogams
Paper- I

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Unit-1

Asco mycotina: Aspergillus, Peziza; Basidomycotina – Puccinia, Deurteromycotina – Cercospora, Colletotrichum; general account of lichens.

Unit-2

Bryophyta: classification, study of morphology, anatomy, reproduction of Hepaticopsida (e.g. Riccia, Marchantia).

Unit-3

Bryophyta: Study of morphology, anatomy reproduction of: Anthrocerotopsida (e.g. Anthocros), Bryopsida (e.g. Polytrichum).

Unit-4

Pteridophyta; important characters and classification, stelar organization, morphology and anatomy of Rhynia

Unit-5

Pteridophyta; Structure Anatomy and reproduction in Lycopodium, Selaginella, Equisetum, and Marsilea.

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Unit-1

DNA the genetic material, DNA structure, Replication the Nucleosome model Satellite and repetitive DNA.

Unit-2

The structure of gene, Genetic code, Transfer of genetic information; Transcription, Translation, Protein Synthesis, tRNA, Ribosomes

Unit-3

Regulation of gene expression in Prokaryotes and Eukaryotes.

Unit-4

Genetic inheritance; Mendelism; laws of segregation and independent assortment; Linkage analysis; interactions of genes.

Unit-5

Genetic variations; Mutations, Spontaneous and induced; transposable elements; DNA damage and repair.

Book:-

1. Alberts B.D.Lewis, J.Raff, M.Ruberts, K. and Watson I.D. 1999 Molecular Biology of Cell Garland Pub. Co.Inc. New York, USA.
2. Atherly, A.G., Girton, J.R. and McDonald, J.F. 1999 the Science of Genetics, Saunders College Pub. Fort Worth, USA.
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6. Sinha & Sinha cytogenetics & plant Breeding Vikas Pub.
- 7 G.M.Smith 1971 Cryptogunle Botany. Vol I. Algae & Fungi Tata McGraw Hill Pub. Co.New Delhi.
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- 9 O.P.Sharma 1992 Text book of Thallopiphytea. McGrew Hill Pub. Co.
- 10 O.P.Sharma 1990 Text book of Pteridophyta. Mcmillan India ltd.

- 11 P.D.Sharma 1991. The Fungi Rastogi & Co.Meerut.
- 12 H.C.Dubey 1990 Anintroduction of fungi. Vikas Pub.house pvt.
- 13 P.Puri 1980 Bryophyta Atma Ram & Sons ,Delhi.
- 14 Rashid Pteridophyta
- 15 P.C.Vashishatha Pteridophyta S.Chand
- 16 Praihar Pteridophyta
- 17 B.R. Vashishatha Bryophyta S.Chand.

BOTANY PRACTICAL WORK

B.Sc. I

Semester – II

2008 -09

1. Study of the morphology reproductive structures and anatomy of the examples given in theory under fungi bryophyte and pteridophyta.
2. Preparation of Karyotypes from dividing root tip cells and pollen grains.
3. Working out the laws of inheritance using seed mixtures.
4. Working out the mode of inheritance of linked genes from test cross and or F2 data.

SCHEME OF PRATICAL EXAMINATION

SEMISTER I

Fungi / Bryophyta - 10

Pteridophyta - 10

Genetical Problem - 10

Spotting - 10

Project - 05

Record - 05

TOTAL 50

Projects

Class - B.Sc I

1. Mass cultivation algae such as Spirulina.
2. Mass cultivation Saccharomyces.
3. Mass cultivation of edible Mushrooms.
4. Mass cultivation of Moss Sticks.

Semester wise syllabus for Undergraduates As recommended by Central board of Studies and Approved by HE the Governor of M.P

5. Role plants in sewage treatment, eg. Azolla, Salvinia, Water hycanthis etc.
6. Phytoremediation of degraded lands/wasteland sush mine overburdens.
7. Study of mitosis in different plant material to study variation in Chromosomes size, eg. Allium cepa and Alovera.
8. Study of meiotic behaviour in Allium cepa.
9. Study of various shapes of Chloroplasts in Algae.
10. Study of mendels laws of Inheritance:-
 - (a) Law of Segregation,
 - (b) Law of Independent assortment.

Note:- Projects other than the above list may also be undertaken related to the syllabus to availability of resources.

11. To Inumerate the diversity of green algae in local fresh water habits.
12. To prepare an inventory of Diatoms from different habitats.
13. To study different types of Cyanobacteria from the local area.
14. To study diversity of Mushroom from tribal areas.
15. To study frequency of lichens in the adjoining natural habitat.
16. To enumerate the diversity of locally cultivated growing pteriophytes.

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Department of Higher Education, Govt. of M.P.
Semester wise syllabus for Undergraduates
As recommended by Central board of Studies and
Approved by HE the Governor of M.P.
Marks-50
Class- B.Sc II
Subject- Botany
Semester- III
Course- Diversity and Systematics of Seeds plants
Paper- I

Unit-1

Characters and classification of Gymnosperms;
Heterospory and origin of seed habit;
Evolution and diversity of Gymnosperms.

Unit-2

Geological time scale, fossilization; Fossil Gymnosperms;
e.g. Lyginopteris, Lygenostoma.

Unit-3

Morphology, Anatomy, Reproduction and Life cycle of Cycas.
Morphology, Anatomy, Reproduction and Life cycle of Pinus.

Unit-4

Morphology, Anatomy, Reproduction and Life cycle of Ephedra.
Origin and evolution of Angiosperm.

Unit-5

Primitive Angiosperms (Magnoliaceae Winteraceae);
Angiosperms taxonomy – aims, fundamental components (alpha, beta & gama taxonomy).

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Semester wise syllabus for Undergraduates
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Marks-50

Class- B.Sc II

Subject- Botany

Semester- III

**Course- Structure, Development and
Reproduction in flowering plants.**

Paper- II

Unit-1

The basic body plan of a flowering plant. Variation in habit of flowering plants, Diversity in plant form in annuals, biennials and perennials.

Unit-2

The root System: The root apical meristem; differentiation of primary and secondary tissues and their roles; Structural modification of storage, respiration, reproduction and interaction with microbes.

Unit-3

The Shoot system: the shoot apical meristem and histological organisation, Anatomy of primary stem in monocotyledons and Dicotyledons.

Unit-4

Formation of internode, Branching pattern – monopodial and Sympodial growth, Canopy architecture.

Unit-5

Vascular cambium and its function; formation of secondary Xylem, Characteristics of growth rings, Sapwood and heart wood secondary phloem, Cork cambium and periderm.

Books:-

1. Bhatnagar, S.P. and Moitra 1996. Gymnosperms. New Age International Limited, New Delhi.
2. Davis, P.H. and Heywood, V.H. 1963. Principles of Angiosperm taxonomy. Oliver and Boyd, London.
3. Gifford, E.M. and Foster, A.S. 1988. Morphology and Evolution of Vascular plants. W.H. Freeman & Company, New York.
4. Heywood, V.H. and Moore, D.M.(eds) 1984. Current concepts in plant taxonomy. Academic press London.
5. Jeffery, C. 1982. An Introduction to plant taxonomy. Cambridge University Press Cambridge, London.
6. Jones, S.B. Jr. and Luchsinger, A.E. 1986. plant systematics (4th edition). McGraw Hill Book Co. New York.
7. Maheshwari, J.K. 1963 Flora of Delhi, CSIR, New Delhi.
8. Radford, A.E. 1986. Fundamentals of plant systematics. Harper and Row, New York.
9. Singh G. 1999. Plant systematics: Theory and Practice. Oxford and IBH pvt.Ltd. New Delhi.

Semester wise syllabus for Undergraduates As recommended by Central board of Studies and Approved by HE the Governor of M.P

10. Sporne, K.R. 1965 The Morphology of Gymnosperms. Hutchinson & Co. pub. Ltd., London.
11. Stewart, W.m. 1983. Paleobotany and the evolution of plants. Cambridge University Press Cambridge.

BOTANY PRACTICAL WORK

B.Sc. II

Semester – III

2009 - 10

Marks -50

1. Section cutting and double staining glycerine mount of Gymnosperms material and their identification. **10**
2. Section cutting and double staining glycerine mount of Angiosperms material and their identification. **10**
3. Studing of branching patterns / plant forms **05**
4. Spotting (1-5) **10**
5. Project. **05**
6. Sessionals. **10**

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