

बरकतउल्ला विश्वविद्यालय, भोपाल
Barkatullah University, Bhopal

As per model syllabus of U.G.C. New Delhi, drafted by Central Board of Studies and Approved by Higher Education and the Governor of M.P.



जीव विज्ञान संकाय
Faculty of Life Science
पाठ्यक्रम एवं निर्धारित पुस्तकें
Syllabus & Prescribed Books

एम.एस.सी. (वनस्पतिशास्त्र)
प्रथम सेमेस्टर
(संशोधित पाठ्यक्रम) परीक्षा
M.Sc. (Botany)
First Semester
(Revised Syllabus) Examination

प्रकाशक
कुलसचिव
बरकतउल्ला विश्वविद्यालय, भोपाल

BARKATULLAH UNIVERSITY, BHOPAL

FIRST SEMESTER

EXAMINATION SCHEME

M.SC. (BOTANY)

- | | |
|--------------------------------------|---|
| 1. Course Code : | 6. Maximum marks : 600 |
| 2. Course Name : M.Sc. Botany | 7. Minimum Passing percentage : 36 |
| 3. Total Paper : 4 | 8. Practical : Y |
| 4. Compulsory Paper : 4 | 9. Practical Passing Marks : 36 each |
| 5. Optional Paper : N | |

Course Code	Paper Code	Paper Name	Theory							Practical		Total	
			Paper			CCE		Total Marks		Max	Min	Max	Min
			1	Max	Min	Max	Min	Max	Min				
	101	Biology & Diversity of Virus, Bacteria & Fungi	85	85	31	15	05	100	36	0	0	100	36
	102	Biology and Diversity of ALGAE	85	85	31	15	05	100	36	0	0	100	36
	103	Biology and Diversity of Bryophyta and Pteridophyta	85	85	31	15	05	100	36	0	0	100	36
	104	Biology and Diversity of Gymnosperms	85	85	31	15	05	100	36	0	0	100	36
		Practical-I (101) Biology & Diversity of Virus, Bacteria & Fungi (102) Biology and Diversity of ALGAE	0	0	0	0	0	0	0	0	0	100	36
		Practical-II (103) Biology and Diversity of Bryophyta and Pteridophyta (104) Biology and Diversity of Gymnosperms	0	0	0	0	0	0	0	0	0	100	36

BARKATULLAH UNIVERSITY, BHOPAL

SEMESTER WISE SYLLABUS FOR M.Sc. BOTANY EXAMINATION AS RECOMMENDED BY BOARD OF STUDIES B.U. BHOPAL (REVISED SYLLABUS)

Class	-	M.Sc.
Subject	-	Botany
Course Code	-	101
Paper name	-	Biology & Diversity of Virus, Bacteria & Fungi
Semester	-	I

Max. Marks : 85

Min. Marks : 31

UNIT-I Viruses: Characteristics Classification and Ultra structure of virions, Isolation and Purification of viruses, Chemical nature, replication, transmission of viruses Economic importance of viruses.

UNIT-II General characteristics classification, Ultra structure, Nutrition, and Reproduction Biology and economic importance of Archaeobacteria, Eubacteria, Cynobacteria, Actinomycetes, Mycoplasma, Rickettsiae, Chlamydiae.

UNIT-III General characteristics, Classification of fungi, Substrate relationship in fungi, Reproduction (Vegetative, Asexual, Sexual). Heterothallic, Para sexuality, Heterokaryosis, Economic Importance of fungi (Fungi in industries, medicine, as food, fungal diseases in plants and Humans, Fungus as biocontrol agent), Mycorrhiza.

UNIT-IV General Characteristics of mastigomycotina- Synchronium, Saprolegnia, Pythium, Phytophthora, Peranospora, Sclerospora.. General characteristics of Zygomycotina-Rhizopus, Pilobolus. General characteristic of Ascomycotina-Yeast, Taphrina, Aspergillus, Penecillium, Erysiphae, Phyllactinia, Uncinulla, Chaetomium, Peziza & Morchella.

UNIT-V General Characteristics of Basidiomycotina-Puccinia, Melampsora, Ustilago, Agaricus, Geastrum. General characteristic of Deuteromycotina—Alternaria, Curvularia, Cercospora, Colletotrichum .

SUGGESTED LABORATORY EXERCISES

- 1. Morphological study of reproductive members of fungi and cyanobacteria :
peronospora, Albugo, Mucor, Pilobolus, Yeast, Chaetomium, Morchella,
Agaricus, Melampsora curvularia, Polyporus, Phoma, Penicillium, Fusarium,
Rhizopus, Aspergillus, Colletotrichum, Nostoc, Anabaena, Gleotrichia,
Rivularia, Microcystis, Oscillatoria, Lyngbya.**
- 2. Symptomology of some diseased specimens: Whiterust, Downy mildew,
Powdery mildew, Rusts, Smut, Ergot, Groundnut leaf spot , red rot of
sugarcane, Wilts, Paddy Blast, Citrus canker, Bacterial blight of paddy,
Angular leaf spot of cotton, Tobacco mosaic, Little leaf of brinjal, Sesame
phyllody, Mango malformation, Leaf curl of papaya.**
- 3. Gram staining of Bacteria.**
- 4. Sterilization methods, preparation of media and stains.**

SUGGESTED READINGS

- Alexopoulos, C.J. Mims, C. W. and Blackwell, M; 1996: Introductory coO' Mycology, Jhon Wiley & Sons Inc.
- Clifton, A; 1958: Introduction to Bacteria, McGraw- Hills Book Co. New Delhi.
- Madigan, M T. Martinko, J. M and Parker Jack; 1997: Brock Biology Of Microorganisms, (8th edition) Prentice Hall, N.J. U.S.A
- Mandahar, C. L.; 1978: Introduction to Plant Viruses. Chand & Co.Ltd. Delhi.
- Mehrotra, R.S. and Aneja, R.S.; 1998: An Introduction to Mycology. New Age Intermediate Press.
- Rangaswamy, G. and Mahadevan, A; 1999: Diseases of Crop Plants in India (4th edn). Prentice Hall of India Ltd. New Delhi.
- Webster, J.; 1985: Introduction to Fungi Cambridge University Press.
- Dubey, R C. & Maheshwari, D. K.; 2005: A Text Book of Microbiology, S. Chand Publisher, New Delhi

BARKATULLAH UNIVERSITY, BHOPAL
SEMESTER WISE SYLLABUS FOR M.Sc. BOTANY EXAMINATION AS
RECOMMENDED BY BOARD OF STUDIES B.U. BHOPAL
(REVISED SYLLABUS)

Class	-	M.Sc.
Subject	-	Botany
Course Code	-	102
Paper name	-	Biology and Diversity of Algae
Semester	-	I

Max. Marks : 85
Min. Marks : 31

UNIT-I General characteristics of Algae: Diversified Habitats, Thallus organization, Cell Ultra structure, reproduction, Criteria for Classification of Algae, Pigmentation reserve food, Flagella Classification, Economic importance of Algae, technique of Algal Culture.

UNIT-II General characteristics of Chlorophyta and Charophyta- Chlamydomonas, Sphaerella, Pandorina, Eudorina, Chlorella, Hydrodictyon, Pediasrtrum, Ulothrix, Cladophora, Draparnadiopsis, Spirogyra, Zygnema, Bryopsis and Nitella.

UNIT-III General characteristics of Xanthophyta: Botrydium, Vaucheria, General characteristics of Bacillariophyta: Diatoms (Pinnularia,) General Characteristics of Euglenophyta :Euglena.

UNIT-IV General Characteristic of Phaeophyta: Ectocarpus, Dictyota, Laminaria, Fucus, Sargassum.

UNIT-V General Characteristic of Rhodophyta: Porphyra, Batrachospermum, Gelidium, Cryptonemia, Gigartina,, Rhodymenia, Polysiphonia.

SUGGESTED LABORATORY EXERCISES

1. Morphological study of representative members of Algae
2. Volvox, Pandorina, Chara, Nitella, Oedogoneum, Spirogyra, Zygnema, Coleochaete, Chaetophora, Hydrodictyon, Ulva, Pithophora , Stigloclonium , Draparnaldiopsis , Clostridium , Cosmarium , Valonia , Vaucharia , Botydium,

Dictyota , Padina , Laminaria , Saragassum, Fucus , Cutleria , Porphyra ,
Batrachospermum , Gracillaria, Polysiphonia

3. Study of algae as Biofertilizer, algal bloom.

4. Study the role of algae in Eutrophication.

5. Culture technique of Algae .

SUGGESTED READINGS

- Smith G. M. Cryptogamic Botany Vol I(1st edition)~ TataMcGraw-Hill Publishing Company Ltd. Bombay -New Delhi.
- Kumar H. D. 1988: Introduction to Phycology. Affiliated East-West Press Ltd.
- Prescott,G.W.,1969. The Algae:A review . Butler &Tanner Ltd., From & London
- Chapman & Chapman, The Algae
- Sharma O.P.,The Algae
- Gangulee, H.C. &Car ,A.K. Vol. I&II ,1989, College Botany, Books & allied(P Ltd. , Calcutta
- Fritsch, F.E. , Vol.I, 1965, The Structure and Reproduction of the Algae,The Syndics of Cambridge university Press

BARKATULLAH UNIVERSITY, BHOPAL

SEMESTER WISE SYLLABUS FOR M.Sc. BOTANY EXAMINATION AS RECOMMENDED BY BOARD OF STUDIES B.U. BHOPAL (REVISED SYLLABUS)

Class	-	M.Sc.
Subject	-	Botany
Course Code	-	103
Paper name	-	Biology and Diversity of Bryophyta and Pteridophyta
Semester	-	I

Max. Marks : 85

Min. Marks : 31

- UNIT-I** General Characteristics, Classification, Morphology, Reproduction, Life history, Distribution, Origin, Evolution & Affinities, Ecology and Economic Importance of Bryophytes. Contribution to Bryophytes in India.
- UNIT-II** General Characteristic of Hepaticopsida- Marchantia, Targionia, Dumortiera, Cythodium, Plagiochasma, Sphaerocarpus, Pellia, Porella. General Characteristic of Anthocerotopsida: Anthoceros, Notothylas. General Characteristic of Bryopsida : Sphagnum, Polytrichum.
- UNIT-III** General Characteristic, Classification, Origin, Telome Theory, Stellar Organization, Homospory, Heterospory and Seed Habit, Reproduction, Indian Contribution to Pteridophyta, Palaeobotany & Geological Time- Scale. Fossilization Types of Fossils.
- UNIT-IV** General Characteristic of Psilophyta : Rhynia, Horniophyton, Zosterophyllum, Psilophyton, Asteroxylon, Psilotum, Tmesipteris. General Characteristics of Lycopside: Lycopodium, Protolpidodendron Lepidodendron, Isoetes, Selaginella,
- UNIT-V** General Characteristics of Sphenophyta : Hyenia, Sphenophyllum, Calamites, Equisetum, General Characteristic of Filicophyta: Ophioglossum, Osmunda, Gleichenia, Filicophyta Dryopteris, Lygodium, Marsilia, Salvinia, Azolla,

SUGGESTED LABORATORY EXERCISES

Morphological study of representative members of

Bryophyta: Riccia, Marchantia, Targionia, Dumortiera, Cythodium, Plagiochasma, Peltia, Porella, Anthoceros, Notothylas, Sphagnum, Polytrichum. Economically Important Bryophytes

Pteridophyta :- Psilotum , Isoetes , Lycopodium , Sellagena , Ophioglossum , Osmunda , Lyathia , Marsilea , Salvinia , Azolla , Gleichenia , Dryopteris , Alsophilla , Study of fossil members.

Suggested Reading

Chopra & Kumar 1988 Biology of Bryophyta Wiley Eastern Ltd.

Kashyap-1972 Liver Works of western Himalayas and Panjab. Research co. Publication.

Parihar-N.S.1991 Bryophyta, Central Book Depot. Allahabad.

Puri .P.1980 Bryophyta Morphology, Growth and Differentiation , Atama Ram and sons, Delhi.

Ram Udar 1970 An introduction to Bryophyta , Shashidhar Malviya Prakashan.

Smith, G. M. Cryptogamic Botany. Vol II Tata Mc Grew- Hill Publishing Company Bombay, New Delhi.

Watson 1968 Structure and life of Bryophyta. Hutchinson & company Ltd.

Arnold C.A. An Introduction to Paleobotany, Tata Mc Graw- Hill Publishing co New Delhi.

Eames A.J. Morphology of Vascular Plants- Lower groups, Tata Mc Graw Hill Publishing co. New Delhi.

Parihar, N.S. 1965 Pteridophyta, Central Book Depot,Allahabad.

Parihar, N.S. 1996 Biology and Morphology of pteridophytes. Central Book Depot Allahabad.

Rashid, A. 1999 An Introduction to pteridophytes, Vikash Publising House Pvt .Ltd.

Sporne, K.R. 1991 The morphology of pteridophytes.

BARKATULLAH UNIVERSITY, BHOPAL

SEMESTER WISE SYLLABUS FOR M.Sc. BOTANY EXAMINATION AS RECOMMENDED BY BOARD OF STUDIES B.U. BHOPAL (REVISED SYLLABUS)

Class	-	M.Sc.
Subject	-	Botany
Course Code	-	104
Paper name	-	Biology and Diversity of Gymnosperms
Semester	-	I

Max. Marks : 85

Min. Marks : 31

UNIT-I General Characteristics, Classification, Distribution of Gymnosperms in India,, Economic Importance, Evolutionary Tendencies in Gymnosperms Indian Contribution to Gymnosperms.

UNIT-II General Characteristics of fossil Gymnosperms, (Pteridospermales): Lygenopteris, Medullosa, Glossopteris, Caytonia, Pentoxylon,

UNIT-III General characteristics of (Cycadeoidales & Cycadales): Bennettitales, Williamsonia, Cycadeoidea, Cycas, Zamia Nillsonia.

UNIT-IV General Characteristics of Ginkgoales, Corditales and Coniferales: Ginkgo, Cordites, Cedrus, Pinus, Araucaria, Cryptomeria, Thuza, Cupressus, Podocarpus, Taxux.

UNIT-V General Characteristics of Ephedrales, Welwitschiales And Gnetales : Ephedra, Welwitschia, Gnetum.

SUGGESTED LABORATORY EXERCISES

1. Monographic study of following :- Cycas ,Pinus, Ginkgo , Cedrus , Abies , Picea , Cupressus , Araucaria , Cryptomeria , Taxodium , Podocarpus , Agathis , Taxus , Ephedra and Gnetum. Economically important Gymnosperms
2. Study of important fossil gymnosperm from prepared slides and specimens.

Suggested Reading :-

Bhatnager, S.P. and Moitra, A. 1996; Gymnosperm. New Age International, Pvt. Ltd New Delhi.

Chamberlin, Gymnosperms- Structure & Evolution ; CBS Publisher & Distributors Delhi.

Singh, H. 1978 Embryology of Gymnosperms, Gebruder Bortrager, Berlin

Shukla A.C. &Mishra S.P. Essentials of Paleobotany; Vikash Publishing House Pvt. Ltd. Delhi, Bombay.

Practical - I

MM : 100

Practical Base on the Course Code 101: Biology & Diversity of Virus, Bacteria & Fungi & Course Code 102: Biology and Diversity of Algae

**M.Sc Botany (Semester system)
SEMESTER-I
Practical scheme for Part-I
(Based on Course PG 101 and 102)**

**M.M-100
Exercise –**

Time 4 Hrs

- | | |
|---|----|
| 1. Prepare a slide of given material A (fungi). Draw well labelled diagrams. Identify giving reasons..... | 12 |
| 2. Bacterial Staining | 08 |
| 3. Prepare a slide of given material B (Algal mixture). Draw well labelled diagrams. At least Three Algae Identify giving reasons | 30 |
| 4. 1 to 10 spot..... | 20 |
| 5. Viva Voce..... | 10 |
| 6. Sessional..... | 20 |

100

Practical Base on the Course Code 103: Biology and Diversity of Bryophyta and Pteridophyta & Course Code 104: Biology and Diversity of Gymnosperms

**M.Sc Botany (Semester system)
SEMESTER-I
Practical scheme for Part-II
(Based on Course PG 103 and 104)**

M.M-100

Time 4 Hrs

Exercise –

- 1. Prepare a slide of given material B (Bryophyte). Draw well labelled diagrams. Identify giving reasons 15**
- 2. Prepare a slide of given material C (Pteridophyta). Draw well labelled diagrams. Identify giving reasons 15**
- 3. Monographic study of given material D (Gymnosperm). Draw well labelled diagrams. Identify giving reasons 20**
- 4. 1 to 10 spot..... 20**
- 5. Viva Voce..... 10**
- 6. Sessional..... 20**

100