



GOVIND GURU TRIBAL UNIVERSITY BANSWARA

B.Sc.
Three-Year Graduate Course
Semester I
BOTANY
DCC
Biodiversity
(Microbes, Algae, Fungi, Lichen and Mycorrhiza)

Unit 1 : Microbes and Fungi

Viruses - Discovery, general structure, replication, Viroid and Prion; **Bacteria**-Discovery, General characteristics and cell structure; Recombination transformation and transduction and conjugation, **Mycoplasma** - General characteristics; **Fungi**- General characteristics, reproduction and classification proposed by Alexopoulos; True Fungi - General characteristics, Brief study of life cycle of *Penicillium*, *Alternaria*, *Puccinia*; Symbiotic Associations- Lichens and Mycorrhiza.

Unit2: Algae and Bryophytes

General characteristics; Range of thallus organisation and reproduction; Classification of algae proposed by Frietsch.; Morphology and life-cycles of the following: *Nostoc*, *Oedogonium*, *Ectocarpus*, *Polysiphonia*. Economic importance of algae

Bryophytes-General characteristics, Classification (up to family) with examples, morphology, anatomy and reproduction of *Riccia*, *Marchantia*, *Anthoceros* and *Sphagnum*, Economic and Ecological importance.

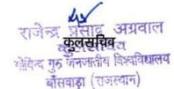
श्री गोविंद गुरु अंग्रेजी
बांसवाड़ा
गोविंद गुरु जनजातीय विश्वविद्यालय
बौसवाड़ा (राजस्थान)

Unit 3 : Pteridophytes and Gymnosperms

Pteridophytes- General characteristics, Classification (up to family) with example morphology, anatomy and reproduction of *Psilotum*, *Equisetum*, *Selaginella* and *Marsilea*, Heterospory and origin of seed habit, stelar types and evolution. **Gymnosperm-** General characteristics and broad classification (up to family) with examples of gymnosperms. Occurrence, structure, life history of *Cycas*, *Pinus* and *Ephedra* and economic importance.

Suggested Reading:

1. Robert Edward Lee. (2018). Phycology. Cambridge University Press, U.K. 5th edition.
2. Kumar,H.D.(1999).IntroductoryPhycology.AffiliatedEast-We'st.PressPvt,Ltd.Delhi.2ndedition.
3. Sambamurty, A.V.S.S. (2006). A textbook of Algae. I.K International Publishing House,Pvt.Ltd.
4. Sharma, O. P. (2011). Algae. Tata McGraw Hill Education Private Limited, U.K. 1st edition
5. Pandey, S.N and Trivedi, P.S. (2015). A text book of Botany Vol.I Vikas publishing House PvtLtd, New Delhi.
6. Pandey, B.P. (2010). College Botany Vol II. S. Chand and Company Ltd., New Delhi,India.
7. Tortora,G.J.Funke,B.R.,Case,C.L.(2010).Microbiology: AnIntroduction, Pearson Benjamin Cummings, U.S.A.edition.



- 8 PelczarM.J., Chan E.C.S and KreigN.R. (1997). Microbiology. Tata MacGrawHill.
- 9 Willey, J M., Sherwood, L.M. and Woolverton, C.J. (2017). Prescott's Microbiology, 11thEdition, McGraw-Hill, USA.
- 10 Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology.Tata McGrawHill, Delhi,India.
- 11 Sethi,I.K.andWalia,S.K.(2011),TextbookofFungi&TheirAllies,MacMillanPublishersPvt.Ltd.,Delhi.
- 12 Alexopoulos,C..1.,Mims,C.W.,Blackwell,M.(1996).IntroductoryMycology,John WileyandSons(Asia),Singapore.4thedition.
- 13 Mehrotra, R.S. and K.R. Aneja. (1999). An Introduction to Mycology. New Age InternationalPublisher.
- 14 Webster, J. and Weber, R. (2007). Introduction to Fungi. Third Edition. CambridgeUniversityPress. Cambridge and New York.
- 15 Parihar, N.S. (1991). An Introduction to Embryophyta Vol. I Bryophyta. Central Book Depot, Allahabad.
- 16 Vashishta, P.C., Sinha, A.K., Kumar, A. (2010). Bryophyta, S. Chand. Delhi, India.
- 17 BhatnagarS.P and MoitraAlok 1996. Gymnosperms. New Age International Pvt. Ltd.Publishers, NewDelhi, India.
- 18 BierhorstD.W. (1971). Morphology of Vascular Plants. New York and London.
- 19 Sporne K.R. (2015). Morphology of Gymnosperms, Scientific Publishers, Jodhpur


 राजीव शतान अग्रवाल
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 एवं विद्यालय
 गोदावरी मुनि एकाकीय विद्यालय
 बीतवडा (गोदावरी)

Practical Exercises

1. Study of vegetative and reproductive structures of *Nostoc*, *Oscillatoria*, *Volvox*, *Oedogonium*, *Chara*, *Ectocarpus* and *Polysiphonia* through temporary preparations / permanent slides/specimens.
2. Study of external and internal morphology and microscopic preparations of the following taxa of Bryophytes, Pteridophytes, Fungi and Pathogens: *Riccia*, *Marhantia*, *Anthoceros*, *Sphagnum*, *Selaginella*, *Equisetum*, *Penicillium*, *Alternaria*, *Puccinia*, *Agaricus*.
3. Lichens: (specimens)
4. Mycorrhiza: ectomycorrhiza and endomycorrhiza (Photographs).
5. Electron micrographs/Models of Viruses – T-Phage and TMV, Line drawing / Photograph of Lytic and Lysogenic Cycle.
6. Gram staining technique
7. Temporary, double-stained microscopic preparations of T.S. of the stem of *Pinus* and *Ephedra* and T.S. Leaflet and Rachis of *Cycas* and needle of *Pinus*, T.S. of normal and coral loid roots of *Cycas*. Study of male cone and megasporophyll of *Cycas*.

Scheme of Practical Examination

S. No.	Exercise	Marks
1.	Exercise-1 Algae	10
2.	Exercise-2 Fungi	8
3.	Exercise-3 Bryophyte	10
4.	Exercise-4 Pteridophyte	10
5.	Exercise-5 Gymnosperm	10
6.	Exercise-6 Microbiology	6
7.	Spot Test	18
8.	Record	8
9.	Viva Voce	20

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