S.R.R. & C.V.R. Government Degree College (A)

An Autonomous & ISO 9001: 2015 Certified Institution:: Ranked by NIRF in 101-150 band at NIRF-2020 & 151-200 band in NIRF 2019 NAAC accredited Institution with grade B+ with C.G.P.A 2.6 during March, 2017

Machavaram, Vijayawada, Krishna District, AP-520 004

BOTANY SYLLABUS

2017-2018

DEPARTMENT OF BOTANY

SRR & CVR GOVERNMENT DEGREE COLLEGE (A), VIJAYAWADA-52004

An autonomous college in the jurisdiction of Krishna University, Machilipatnam. A.P.

I-BZC	BOTANY-I	SEM-I	Course code: BOT 1321	2017-2018	No. of Credits:4	No. of Hrs /Week:4

Microbial Diversity, Algae and Fungi

Objective: On successful completion of this course, the students will be able to know the diversity of Microbes, Algae and Fungi.

CO1: Students will be able to acquire, articulate, retain and apply specialized skills and knowledge relevant to Microbiology
CO2: Able to explore the diversity of microorganisms and microbial communities as well as their significance to humans and nature.
CO3: To Understand the classification, Structure , reproduction and Life History of Algae and Fungi
CO4: To understand history, relevance of microbiology and classification of Microorganisms and special groups of Bacteria
CO5: To understand bacterial cell structure, Nutrition, Reproduction and Economic importance, Virus structure, Replication , Viral diseases

UNIT- I: MICROBIAL WORLD (Origin and Evolution of Life, Microbial diversity (12hrs)

Discovery of microorganisms, origin of life, spontaneous, biogenesis, Pasteur experiments, germ theory of disease.
Classification of microorganisms – R.H. Whittaker's five kingdom concept, Carl Woese's-Domain system.
Brief account of special groups of bacteria- Archaebacteria, Mycoplasma, Chlamydia, Actinomycetes, Rickettsias and Cyanobacteria.

UNIT- II: VIRUSES (12hrs)

Viruses- Discovery, general account, structure & replication of –T4 Phage (Lytic, Lysogenic) and TMV, Viroids, Prions.
Plant diseases caused by viruses– Symptoms, transmission and control measures (Brief account only).
Study of Tobacco Mosaic, Bhendi Vein clearing and Papaya leaf curl diseases.

UNIT III: BACTERIA (12hrs)

Bacteria: Discovery, General characteristics, cell structure and nutrition.
Reproduction- Asexual and bacterial recombination (Conjugation, Transformation, Transduction).
Economic importance of Bacteria.

UNIT –IV Algae (12hrs)

General account - thallus organization and reproduction in Algae.
Fritsch classification of Algae (up to classes only) and economic importance.
Structure, reproduction and life history of Oedogonium, Ectocarpus and Polysiphonia.

UNIT V: FUNGI **(12hrs)**

General characteristics and outline classification (Ainsworth).

Structure, reproduction and life history of Rhizopus (Zygomycota),Penicillium (Ascomycota), and Puccinia (Basidiomycota).

Lichens-Structure and reproduction; ecological and economic importance.

Suggested activity: Seminar, Quiz, debate, collection of diseased plant parts –studying symptoms and identification of pathogen, collection and study of fresh and marine Algae available in local area.

Additional inputs:

Penicillium life cycle

Mushroom cultivation

Outlines of Bacillariophyceae

Books for Reference:

1. Oladele Ogunseitan (2008) Microbial Diversity: Form and Function in Prokaryotes Wiley- Blackwell.

2. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata Mc Graw-Hill Co, New Delhi.

3. Presscott, L. Harley, J. and Klein, D. (2005) Microbiology, 6th edition, Tata Mc Graw- Hill Co. New Delhi.

4. Fritsch F.E. (1935 The Structure & Reproduction of Algae 1945): Cambridge University Press Cambridge, U.K. Vol. I, Vol. II.

5. Smith, G.M (1955) :Cryptogamic Botany(Vol. I Algae, Fungi, & Lichens) McGraw-Hill Book Co., New York .

6. Ian Morris (1967): An Introduction to the Algae, Hutchinson, London.

7. Alexopoulos,C.J.., Mims, C.W. & Blackwell, M. (1996): Introductory Mycology John Wiley& Sons., Inc., N.Y., Chicester, Berisbane, Toronto, Singapore.

8. Webster, J (1999) : Introduction to Fungi(2nd edition) Cambridge University Press.

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I-BZC	BOTANY-I	SEM-I	Course code: BOT 1321P	2017-18	No. of Credits:1	No. of Hrs /Week:2

MICROBILA DIVERSITY, ALGAE AND FUNGI

1. Knowledge of Equipment used in Microbiology: Spirit lamp, Inoculation loop, Hot-air oven, Autoclave/Pressure cooker, laminar air flow chamber and Incubator.
2. Preparation of liquid and solid media for culturing of microbes (Demonstration).
3. Study of viruses and bacteria using electron photo micrographs (TMV, Bacteriophage, HIV, Cocci, Bacillus, Spirillum bacteria).
4. Gram staining technique.
5. Study of Plant disease symptoms caused by Bacteria (Citrus canker, leaf blight of rice, Angular leaf spot of Cotton) and viruses (TMV, Bhendi vein clearing and Leaf curl of Papaya),Fungi (Late blight of potato, Red rot of Sugarcane and Paddy blast).
6. Study of vegetative and reproductive structures of the following :
   a) **Cyanobacteria:** *Nostoc and Scytonema.*
   b) Algae: *Oedogonium, Ectocarpus, Polysiphonia*,
   c) Fungi: *Rhizopus, Penicillium and Puccinia* .
7. Study of plant materialinfected by Fungi (Rot of tomatoes,blue and greenmoulds of Ciitrus fruits and wheat rust(Section cutting of diseased parts of Wheat and Barberry -identification of different spores).
8. Lichens: Morphology and of anatomy of different thalli.
9. Field Visit.

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I-BZC	BOTANY-II	SEM-II	Course code: BOT 2321	2017-2018	No. of Credits:4	No. of Hrs /Week:4

DIVERSITY OF ARCHEGONIATES AND PLANT ANATOMY

Objective: On successful completion of this course, the students will be able to know the diversity, life cycle of Pteridophytes and Gymnosperms and tissues, tissue systems and anomalous secondary growth.

CO1: Able to explore the diversity of Bryophytes and their life cycles
CO2: Able to understand the life cycle of Pteridophytes
CO3: To understand evolution and life cycles of Gymnosperms
CO4: To understand the tissues and tissue systems in Angiosperms.
CO5: Able to know the process of secondary and anomalous secondary growth.

UNIT – I: BRYOPHYTES 12 Hrs

1. Bryophytes: General characters, Classification (up to classes)
2. Structure, reproduction and Life history of *Marchantia*, and *Funaria.*
3. Evolution of Sporophyte in Bryophytes.

UNIT - II: PTERIDOPHYTES 12 Hrs

1. Pteridophytes**:** General characters, classification (up to Classes)
2. Structure, reproduction and life history of *Lycopodium,* and *Marsilea.*
3. Heterospory and seed habit.
4. Evolution of stele in Pteridophytes.

UNIT – III: GYMNOSPERMS 12 Hrs

1. Gymnosperms: General characters, classification (up to classes)
2. Morphology, anatomy**,** reproduction and life history of *Pinus and Gnetum*
3. Economic importance with reference to wood, essential oils and drugs

UNIT-IV: TISSUES AND TISSUE SYSTEMS 12Hrs

1. Meristems - Root and Shoot apical meristems and their histological organization.
2. Tissues – Meristematic and permanent tissues (simple, complex, secretory)
3. Tissue systems**–**Epidermal, ground and vascular.

UNIT-V: SECONDARY GROWTH 12Hrs

1. Anomolous secondary growth in Achyranthes, Boerhaavia and Dracaena
2. Study of local timber of economic importance-Teak, Rose wood, Red sanders and Arjun (Tella maddi)

Additional Inputs:

Study of Rhynia

Structure of Anthoceros sporophyte

Study of fossil Gymnosperms

General process of secondary growth

Books for Reference:

1. Cavers, Frank ( ): The inter-relationships of the Bryophytes New Phytologist, Indian Reprint.

2. Smith, G.M. (1955): Cryptogamic Botany Vol. II. (2nd Edition) (Bryophytes & Pteridophytes) Tata McGraw Hill Publishing Co., New Delhi.

3. Parihar, N.S. ( ): An Introduction to embryophyta – Vol.II. Bryophyta Central Book Depot, Allahabad.

4. Watson, E.V. (1968): British Mosses & Liverworts Cambridge University Press, U.K

5. Eames, A.J. (1936) : Morphology of Vascular Plants (Lower Groups) McGraw Hill, N.Y.

6. Parihar, N.S. (19) : An Introduction to Embryophyta Vol.II Pteridophyta Central Book Depot., Allahabad.

7. Smith, G.M. (1955) :Cryptogamic Botany Vol.II (2nd Edn.,) (Bryophytes & Pteridophytes) Tata McGraw Hill Publishing Co., New Delhi.

8. Sporne, K.R. (1970) : The Morphology of Pteridophytes (The Structure of Ferns and Allied Plants) Hutchinson University Library, London

9.Bierhorst, D.W. (1971) : Morphology of Vascular Plants, The MacMillan Co., N.Y. & Collier- MacMillan Ltd., London.

10. Coulter, J.M.& C.J. Chamberlain (1964) : Morphology of Gymnosperms Central Book Depot, Allahabad.

11. Sporne, K.R. (1971): The Morphology of Gymnosperms (The Structure and Evolution of Primitive seed Plants) Hutchinson University Library, London.

12. Esau, K. (1965) : Vascular Differentiation in Plants. Holt, Rinehart & Winston, N.Y., Chicago, San Fransisco, Toronto, London.

13. Eames, A.J., & Mc Daniels, L.H.(1979) : An Introduction to Plant anatomy Tata- McGraw-Hill Publishing Co., (P) Ltd. Bombay, New Delhi.

14. Esau. K.(1980) : Plant Anatomy, (2nd Edition) Wiley Eastern Ltd., New Delhi

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I-BZC	BOTANY-II	SEM-II	Course code: BOT 2321P	2017-2018	No. of Credits:1	No. of Hrs /Week:2

DIVERSITY OF ARCHEGONIATES AND ANATOMY

Practical syllabus

1. Morphology (vegetative and reproductive structures) , anatomy of the following :

   Marchantia, Funaria, Lycopodium and *Pinus.*

2. Anatomy:

   a) Demonstration of double staining technique.

   b) Tissue organization in root and shoot apices using permanent slides

   c) Preparation of double staining slides

   d) Anomalous secondary structure of *Achyranthes, Boerhavia* and *Dracaena.*

   e) Anatomical study of wood in T.S., T.L.S. and R.L.S.

3. Field visits to local timber depots