

B.Sc. BOTANY I&II Year, CBCS Syllabus
Telangana State Council of Higher Education, Govt. of Telangana B.Sc., CBCS Common Core Syllabi for all Universities in
Telangana
PROPOSED SCHEME FOR
CHOICE BASED CREDIT SYSTEM IN B.Sc., BOTANY

FIRST YEAR

SEMSTER-I

CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
BS 101	Environmental studies	AECC-1	2	2
BS 102	English	CC-1A	5	5
BS 103	Second Language	CC-2A	5	5
BS 104	Optional-I Botany-I Microbial Diversity of Lower Plants	DSC-1A	4T+2P=6	4+1=5
BS 105	Optional-II	DSC-2A	4T+2P=6	4+1=5
BS 106	Optional-III	DSC-1A	4T+2P=6	4+1=5
Total Credits				27

SEMSTER-II

CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
BS 201	Gender Sensitization	AECC-2	2	2
BS 202	English	CC-1B	5	5
BS 203	Second Language	CC-2B	5	5
BS 204	Optional-I Botany-II Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany	DSC-1B	4T+2P=6	4+1=5
BS 205	Optional-II	DSC-2B	4T+2P=6	4+1=5
BS 206	Optional-III	DSC-3B	4T+2P=6	4+1=5
Total Credits				27

SECOND YEAR

SEMSTER-III

BS 301	SEC-I: Biofertilizers	SEC-1	2	2
BS 302	English	CC-1C	5	5
BS 303	Second language	CC-2C	5	5
BS 304	Optional-I BOTANY-III Taxonomy of Angiosperms and Medicinal Botany	DSC-1C	4T+2P=6	4+1=5
BS 305	Optional-II	DSC-2C	4T+2P=6	4+1=5
BS 306	Optional-III	DSC-3C	4T+2P=6	4+1=5
Total Credits				27

SEMSTER-IV

BS 401	SEC-II: Herbal Technology	SEC-2	2	2
BS 402	English	CC-1D	5	5
BS 403	Second language	CC-2D	5	5
BS 404	Optional- I BOTANY-IV Plant Anatomy, Embryology and Palynology	DSC-1D	4T+2P=6	4+1=5
BS 405	Optional II	DSC-2D	4T+2P=6	4+1=5
BS 406	Optional III	DSC-3D	4T+2P=6	4+1=5
Total Credits				27

AECC: Ability Enhancement Compulsory Course, SEC: Skill Enhancement Course, DSC: Discipline Specific Course, DSE: Discipline Specific Elective, GE: Generic Elective

B.Sc (CBCS) Botany- I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants

DSC - 1A (4 hrs./week)

Theory Syllabus

Credits- 4
(60 hours)

UNIT - I

1. Brief account of Archaeobacteria, Actinomycetes. (4h)
2. Cyanobacteria: General characters, cell structure, thallus organisation and their significance as biofertilizers with special reference to *Oscillatoria*, *Nostoc* and *Anabaena*. (6h)
3. Lichens: Structure and reproduction; ecological and economic importance. (5h)

UNIT- II

4. Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro. (7h)
- 5.. Bacteria: Structure, nutrition, reproduction and economic importance. An outline of plant diseases of important crop plants caused by bacteria and their control with reference to Angular leaf spot of cotton and Bacterial blight of Rice. (8h)
6. General account of Mycoplasma with reference to Little leaf of brinjal and Papaya leaf curl

UNIT-III

7. General characters, structure, reproduction and classification of algae (Fritsch) and thallus organization in algae. (3h)
8. Structure and reproduction of the following:
Chlorophyceae- *Volvox*, *Oedogonium* and *Chara*. (5h)
Phaeophyceae- *Ectocarpus* (2h)
Rhodophyceae- *Polysiphonia*. (3h)
9. Economic importance of algae in Agriculture and Industry. (2h)

UNIT-IV

10. General characters and classification of fungi (Ainsworth). (3h)
11. Structure and reproduction of the following:
(a) Mastigomycotina- *Albugo*
(b) Zygomycotina- *Mucor*
(c) Ascomycotina- *Saccharomyces* and *Penicillium*.
(d) Basidiomycotina- *Puccinia*
(e) Deuteromycotina- *Cercospora*. (10h)
12. Economic importance of fungi in relation to mycorrhizae and mushrooms. General account of mushroom cultivation (2h)

References:

1. Alexopolous, J. and W. M. Charles. 1988. Introduction to Mycology. Wiley Eastern, New Delhi.
2. Mckane, L. and K. Judy. 1996. Microbiology – Essentials and Applications. McGraw Hill, New York.
3. Pandey, B. P. 2001. College Botany, Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd, New Delhi.
4. Pandey, B. P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology and Genetics. S. Chand & Company Ltd, New Delhi.
5. Sambamurthy, A. V. S. S. 2006. A Textbook of Plant Pathology. I. K. International Pvt. Ltd., New Delhi.
6. Sambamurthy, A. V. S. S. 2006. A Textbook of Algae. I. K. International Pvt. Ltd., New Delhi.
7. Sharma, O. P. 1992. Textbook of Thallophyta. McGraw Hill Publishing Co., New Delhi.
8. Thakur, A. K. and S. K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.
9. Vashishta, B. R., A. K. Sinha and V. P. Singh. 2008. Botany for Degree Students: Algae. S. Chand& Company Ltd, New Delhi.
10. Vashishta, B. R. 1990. Botany for Degree Students: Fungi, S. Chand & Company Ltd, New Delhi.
11. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.

**B.Sc (CBCS) Botany-I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants**

Theory Model Question Paper

Time : 2 hrs

Max. Marks: 40

Draw well-labeled diagrams wherever necessary.

1. Write short notes on any FOUR of the following: -

4 X 2 = 8M

- a. Heterocyst.
- b. Citrus Canker.
- c. Nucule
- d. Cleistothecium.
- e. Mycoplasma
- f. *Mucor*

II. Essay Questions:

4 X 8 = 32M

1. a. Briefly describe the structure and reproduction of *Oscillatoria*.

(OR)

b. Describe the cyanophycean cell structure.

2. a. Describe the structure and modes of transmission of plant viruses.

(OR)

b. Write an essay on economic importance of Bacteria.

3. a. Describe the life cycle of *Oedogonium* with the help of well- labelled diagram .

(OR)

b. Give an account on thallus organization in algae.

4. a. Describe the life cycle of *Albugo* with the help of well-labelled diagram .

(OR)

b. Give a brief account on Mushroom cultivation.

**B.Sc (CBCS) Botany-I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants**

Practical Syllabus

(45 hours)

1. Study of viruses and bacteria using electron micrographs (photographs). (3h)
2. Gram staining of Bacteria. (3h)
3. Study of symptoms of plant diseases caused by viruses, bacteria, Mycoplasma and fungi:
Viruses: Tobacco mosaic
Bacteria: Angular leaf spot of cotton and Rice tungro.
Mycoplasma: Little leaf of Brinjal and Leaf curl of papaya (3h)
Fungi: White rust on Crucifers, Rust on wheat & Tikka disease of Groundnut. (6h)
4. Vegetative and reproductive structures of the following taxa:
Algae: *Oscillatoria*, *Nostoc*, *Volvox*, *Oedogonium*, *Chara*, *Ectocarpus*
and *Polysiphonia*. (6 h)
Fungi: *Albugo*, *Mucor*, *Saccharomyces*, *Penicillium*, *Puccinia* and *Cercospora* (6h)
5. Section cutting of diseased material infected by Fungi and identification of pathogens as per theory syllabus. White rust of Crucifers, Rust on wheat & Tikka disease of Groundnut. (9h)
6. Lichens: Different types of thalli and their external morphology (3 h).
7. Examination of important microbial, fungal and algal products:
Biofertilizers, protein capsules, antibiotics, mushrooms, Agar-agar etc. (3h)
8. Field visits to places of algal / microbial / fungal interest (e.g. Mushroom cultivation, water bodies). (3h)

B.Sc (CBCS) Botany- I year
Semester-I - Paper-I
Microbial Diversity of Lower Plants

Practical Model Paper

Time : 2 1/2 hrs

Max. Marks: 25

1. Identify the given components 'A' , 'B' & 'C' in the algal mixture .
Describe with neat labeled diagrams & give reasons for the classifications. **3 X 3 = 9M**
2. Classify the given bacterial culture 'D' using Gram – staining technique. **4M**
3. Take a thin transverse section of given diseased material 'E'.
Identify & describe the symptoms caused by the pathogen. **5M**
4. Identify the given specimens 'F', 'G' & 'H' by giving reasons .
(Fungal-1, Bacteria-1 & Viral-1) **3 X 1 = 3M**
5. Comment on the given slides 'I' & 'J' .
(Algae-1 , Fungi-1) **2 X 1 = 2M**
6. Record **2M**

B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Bryophytes, Pteridophytes, Gymnosperms and Paleobotany

DSC-1B (4 hrs./week)

Theory Syllabus

Credits- 4
(60 hours)

UNIT-I

1. Bryophytes: General characters and classification. (3h)
2. Structure, reproduction, life cycle and systematic position of *Marchantia*, *Anthoceros* and *Polytrichum*. (Development stages are not required). (10h)
3. Evolution of Sporophyte in Bryophytes. (2h)

UNIT-II

4. Pteridophytes: General characters and classification (Sporne's) (3h)
5. Structure, reproduction, life cycle and systematic position of *Rhynia*, *Lycopodium*, *Equisetum* and *Marsilea*. (10h)
6. Stelar evolution, heterospory and seed habit in Pteridophytes. (2h)

UNIT-III

7. Gymnosperms: General characters, structure, reproduction and classification (Sporne's). (4h)
8. Distribution and economic importance of Gymnosperms. (3h)
9. Morphology of vegetative and reproductive parts, systematic position and life cycle of *Pinus* and *Gnetum* . (8 h)

UNIT-IV.

10. Palaeobotany: Introduction, Fossils and fossilization ; Importance of fossils. (8 h)
11. Geological time scale; (4 h)
12. Bennettitales: General account. (3 h)

References:

1. Watson, E. V. 1974. The structure and life of Bryophytes, B. I. Publications, New Delhi.
2. Pandey, B. P. 2006. College Botany, Vol. II: Pteridophyta, Gymnosperms and Paleobotany. S. Chand & Company Ltd, New Delhi.
3. Sporne, K. R. 1965. Morphology of Gymnosperms. Hutchinson Co., Ltd., London.
4. Vashishta, P. C., A. K. Sinha and Anil Kumar. 2006. Botany - Pteridophyta (Vascular Cryptogams). . Chand & Company Ltd, New Delhi.
5. Pandey, B. P. 2001. College Botany, Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd, New Delhi.
6. Pandey, B. P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology and Genetics. S. Chand & Company Ltd, New Delhi.
7. Thakur, A. K. and S. K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.
8. Vashishta, B. R., A. K. Sinha and Adarsha Kumar. 2008. Botany for Degree Students: Bryophyta. S. Chand & Company Ltd, New Delhi.
9. Vashishta, P. C., A. K. Sinha and Anil Kumar. 2006. Botany for Degree Students: Gymnosperms. Chand & Company Ltd, New Delhi.
10. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.

B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Bryophytes, Pteridophytes, Gymnosperms and Paleobotany

Theory Model Question Paper

Time : 2 hrs

Max. Marks: 40

Draw well-labeled diagrams wherever necessary.

I . Write short notes on any FOUR of the following: - **4 X 2 = 8M**

- a. Gemma cup.
- b. Protostele .
- c. *Pinus* pollen grain.
- d. *Ptilophyllum*.
- e. *Anthoceros* thallus
- f. Fossilization

II . Essay Questions: **4 X 8 = 32M**

- 1. a. Write about the structure & evolution of sporophyte in *Anthoceros* .
(OR)
b. Describe the gametophores of *Marchantia* .
- 2. a. Describe the anatomy of *Equisetum* stem & add a note on its ecological adaptations .
(OR)
b. Discuss in detail the internal structure of the sporocarp of *Marsilea* .
- 3. a. Describe the anatomy of *Pinus* needle with a well labeled diagram.
(OR)
b. Give an account of general characters of Gymnosperms.
- 4. a. Describe the general characters of Bennettitales .
(OR)
b. Write about economic importance of Gymnosperms.

B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Bryophytes, Pteridophytes, Gymnosperms and Paleobotany

(45 hours)

Practical Syllabus – 2016

1. Study of Morphology (vegetative and reproductive structures) and anatomy of the following
Bryophytes: *Marchantia*, *Anthoceros* and *Polytrichum*. (9 h)
2. Study of Morphology (vegetative and reproductive structures) and anatomy of the following
Pteridophytes: *Lycopodium*, *Equisetum* and *Marsilea*. (9 h)
3. Study of Anatomical features of *Lycopodium* stem, *Equisetum* stem and *Marsilea* petiole &
rhizome by preparing double stained permanent mounts. (12h)
4. Study of Morphology (vegetative and reproductive structures) of the following taxa:
Gymnosperms: *Pinus* and *Gnetum*. (6 h)
5. Study of Anatomical features of *Pinus* needle and *Gnetum* stem by preparing double stained
permanent mounts. (6h)
6. Fossil forms using permanent slides / photographs: *Rhynia* and *Cycadeoidea*. (3h)

B.Sc (CBCS) Botany- I year
Semester-II - Paper-II
Bryophytes, Pteridophytes, Gymnosperms and Paleobotany

Practical Model Paper

Time : 2 1/2 hrs

Max. Marks: 25

1 . Prepare a double stained permanent mount of the given material ' A ' (Pteridophyte)

Draw diagram & give reasons for identification. **7M**

2 . Prepare a double stained permanent mount of the given material ' B ' (Gymnosperms)

Draw diagram & give reasons for identification. **8M**

3 . Identify the given specimens C , D , E & F (Bryophyte – 2 , Pteridophyte – 1 & Gymnosperm – 1) **4 X 1 =4M**

4 . Identify the given slides G , H , I & J (Bryophyte – 2 , Pteridophyte – 1

& Gymnosperm – 1) **4 X 1 =4M**

5 . Record **2M**