Proposed
B.Sc. Botany Syllabus

Under Choice Based Credit System

2019-20

Meeting held with Heads & Chairperson, BOS of Six Conventional Universities on 15th June, 2019 at TSCHE-Hyderabad.
## Annexure – I (Credits)
### Proposed CBCS Scheme for B.Sc.
w.e.f 2019-20

<table>
<thead>
<tr>
<th>Courses</th>
<th>Papers</th>
<th>Total Credits</th>
<th>Credits for each paper / Semester</th>
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<tbody>
<tr>
<td><strong>Core Courses</strong></td>
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<td><strong>B.Sc.</strong></td>
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<tr>
<td>DSC Optional-1</td>
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<td><strong>Ability Enhancement Compulsory Course AEC</strong></td>
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<td>Environmental Science / Basic Computer Skills</td>
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<tr>
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<td>Project Work / Optionals</td>
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<td><strong>Total Credits in each semester</strong></td>
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<td><strong>Credits under Non-CGPA</strong></td>
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<td><strong>Upto 6 (2 in each year)</strong></td>
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<td><strong>Summer Internship</strong></td>
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<td><strong>Upto 4 (2 in each, after I &amp; II years)</strong></td>
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## Annexure II
### Proposed New Grading System

### SGPA (Semester Grade Point Average)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Grade Point</th>
<th>Range of marks</th>
<th>Grade Letter</th>
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<td>10</td>
<td>Equal to and above 90 Marks</td>
<td>A+</td>
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<td>2</td>
<td>9</td>
<td>More than or equal to 80 and less than 90 Marks</td>
<td>A</td>
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<tr>
<td>3</td>
<td>8</td>
<td>More than or equal to 70 and less than 80 Marks</td>
<td>B+</td>
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<tr>
<td>4</td>
<td>7</td>
<td>More than or equal to 60 and less than 70 Marks</td>
<td>B</td>
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<td>5</td>
<td>6</td>
<td>More than or equal to 55 and less than 60 Marks</td>
<td>C+</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>More than or equal to 50 and less than 55 Marks</td>
<td>C</td>
</tr>
<tr>
<td>7</td>
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<td>More than or equal to 40 and less than 50 Marks</td>
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<tr>
<td>8</td>
<td>0</td>
<td>Below 40 Marks</td>
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**Signature:**

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### TELANGANA STATE COUNCIL OF HIGHER EDUCATION
PROPOSED CBCS COMMON CORE SCHEME FOR B.SC. COURSE
OPTIONAL - I: BOTANY

<table>
<thead>
<tr>
<th>CODE</th>
<th>PAPER TITLE</th>
<th>Course Type</th>
<th>HPW</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BS 104</td>
<td>PAPER-I: Microbial Diversity and Lower Plants</td>
<td>DSC-1A</td>
<td>4T+2P=6</td>
<td>4+1=5</td>
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<tr>
<td>BS 204</td>
<td>PAPER-II: Gymnosperms, Taxonomy of Angiosperms and Ecology</td>
<td>DSC-1B</td>
<td>4T+2P=6</td>
<td>4+1=5</td>
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<tr>
<td>BS 301</td>
<td>SEC-1: Nursery and Gardening</td>
<td>SEC-1</td>
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<td>2</td>
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<td>BS 302</td>
<td>SEC-2: Biofertilizers and Organic Farming</td>
<td>SEC-2</td>
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<td>BS 304</td>
<td>PAPER-III: Plant Anatomy and Embryology</td>
<td>DSC-1C</td>
<td>4T+2P=6</td>
<td>4+1=5</td>
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<tr>
<td>BS 401</td>
<td>SEC-3: Greenhouse Technology</td>
<td>SEC-3</td>
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<td>2</td>
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<tr>
<td>BS 402</td>
<td>SEC-4: Mushroom Culture Technology</td>
<td>SEC-4</td>
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<td>BS 404</td>
<td>PAPER-IV: Cell Biology, Genetics &amp; Plant Physiology</td>
<td>DSC-1D</td>
<td>4T+2P=6</td>
<td>4+1=5</td>
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<td>DSE-1B: Economic Botany</td>
<td>DSE-1B</td>
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<td>PROJECT (Group Projects)</td>
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<td>DSE-2B: Tissue Culture and Biotechnology</td>
<td>DSE-2B</td>
<td>4T+2P=6</td>
<td>4+1=5</td>
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<td>DSE-2C: Analytical Techniques in Plant Sciences</td>
<td>DSE-2C</td>
<td>4T+2P=6</td>
<td>4+1=5</td>
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</tbody>
</table>

**AECC:** Ability Enhancement Compulsory Course, **SEC:** Skill Enhancement Course, **GE:** Generic Elective, **DSC:** Discipline Specific Core, **DSE:** Discipline Specific Elective.
UNIT - I

1) **Bacteria:** Structure, nutrition, reproduction and economic importance. Brief account of Archaebacteria, Actinomycetes and Mycoplasma with reference to little leaf of Brinjal and Papaya leaf curl.

2) **Viruses:** Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro.

3) 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.

UNIT-II

1) General characters, structure, reproduction and classification of algae (Fritsch).

2) **Cyanobacteria:** General characters, cell structure their significance as biofertilizers with special reference to Oscillatoria, Nostoc and Anabaena.

3) Structure and reproduction of the following:
   - Chlorophyceae- Volvox, Oedogonium and Chara.
   - Phaeophyceae- Ectocarpus
   - Rhodophyceae- Polysiphonia.

UNIT-III

1) General characters and classification of fungi (Ainsworth).

2) Structure and reproduction of the following:
   - (a) Mastigimycotina- Albugo
   - (b) Zygomycotina- Mucor
   - (c) Ascomycotina- Saccharomyces and Penicillium.
   - (d) Basidimycotina- Puccinia
   - (e) Deuteromycotina- Cercospora.

3) Economic importance of lichens

UNIT-IV

1) **Bryophytes:** Structure, reproduction, life cycle and systematic position of Marchantia, Anthoceros and Polytrichum, Evolution of Sporophyte in Bryophytes.

2) **Pteridophytes:** Structure, reproduction, life cycle and systematic position of Rhynia, Lycopodium, Equisetum and Marsilea.

3) Stelar evolution, heterospory and seed habit in Pteridophytes.
References:

Practical Syllabus

1. Study of viruses and bacteria using electron micrographs (photographs).
2. Gram staining of Bacteria.
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
   - Fungi: White rust on Crucifers, Rust on wheat & Tikka disease of Groundnut.
4. Vegetative and reproductive structures of the following taxa:
   - Algae: Oscillatoria, Nostoc, Volvox, Oedogonium, Chara, Ectocarpus and Polysiphonia.
   - Fungi: Albugo, Mucor, Saccharomyces, Penicillium, Puccinia and Cercospora
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.
6. Lichens: Different types of thalli and their external morphology
7. Examination of important microbial, fungal and algal products:
   - Biofertilizers, protein capsules, antibiotics, mushrooms, Agar-agar etc.
8. Field visits to places of algal / microbial / fungal interest (e.g. Mushroom cultivation, water bodies).
9. Study of Morphology (vegetative and reproductive structures) and anatomy of the following Bryophytes: Marchantia, Anthoceros and Polytrichum.
10. Study of Morphology (vegetative and reproductive structures) and anatomy of the following Pteridophytes: Lycopodium, Equisetum and Marsilea.
11. Study of Anatomical features of Lycopodium stem, Equisetum stem and Marsilea petiole & rhizome by preparing double stained permanent mounts.

Practical Model Paper

Max. Marks: 25
Time: 3 hrs

1. Identify the given components ‘A’ & ‘B’ in the algal mixture.
   Describe with neat labeled diagrams & give reasons for the classifications.
   2 x 2 = 4M
2. Classify the given bacterial culture ‘D’ using Gram – staining technique.
   3M
3. Take a thin transverse section of given diseased material ‘E’.
   Identify & describe the symptoms caused by the pathogen.
   4M
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 2 = 4M
6. Identify the given specimen ‘K’ & slide ‘L’ (Bryophytes & Pteridophytes)
   2 x 2 = 4M
7. Record

Signature

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B.Sc., BOTANY
First Year, II -Semester

Paper-II
Gymnosperms, Taxonomy of Angiosperms and Ecology

DSC-1B

Credits-4

Theory Syllabus

(60 hours)

UNIT-I

(15 hours )

1) Gymnosperms: General characters, structure, reproduction and classification (Sporne’s). Distribution and economic importance of Gymnosperms.

2) Morphology of vegetative and reproductive parts, systematic position and life cycle of Pinus and Gnetum,

3) Geological time scale Introduction to Palaeobotany, Types of fossils and fossilization, Importance of fossils.

UNIT-II

(15 hours)


3) Nomenclature and Taxonomic resources: An introduction to ICN, Shenzhen code – a brief account. Herbarium: Concept, techniques and applications.

UNIT-III

(15 hours)

1) Systematic study and economic importance of plants belonging to the following families:
   Polypetalae Annonaceae, Capparidaceae, Rutaceae, Fabaceae (Faboideae/Papilionoideae, Caesalpinioideae, Mimosoideae), Cucurbitaceae

2) Gamopetalae: Apiaceae, Asteraceae, Asclepiadaceae, Lamiaceae, Monochalmydeae:
   Amaranthaceae, Euphorbiaceae

3) Monocotyledons: Orchidaceae, Poaceae and Zingeberaceae.

UNIT-IV

(15 hours)

1. Component of eco system, energy flow, food chain and food webs.

2. Plants and environment, ecological adaptations of plants, Hydrophytes, Xerophytes and Mesophytes

References:

Page
Practical Syllabus

1. Study of Morphology (vegetative and reproductive structures) of the following taxa:
   Gymnosperms - Pinus and Gnetum.
2. Study of Anatomical features of Pinus needle and Gnetum stem by preparing double stained permanent mounts.
   Systematic study of locally available plants belonging to the families prescribed in theory
   Syllabus (Minimum of one plant representative for each family)
4. Study of morphological and anatomical characteristics of locally available plant species (Eichhorinia, Hydrilla, Pistia, Nymphaea, Asparagus, Opuntia, Euphorbia melii)
5. Demonstration of herbarium techniques.
6. Candidate has to submit at least 30 herbarium sheets.

Practical Model Paper

Time: 3 hrs

Max. Marks: 50

1. Prepare a mount of the given material ‘ A ‘ (Hydrophytes /Xerophytes)
   Draw diagram & give reasons for identification.
   8M
2. Prepare a double stained permanent mount of the given material ‘ B ‘ (Gymnosperms)
   Draw diagram & give reasons for identification.
   10M
3. Identify the given specimens C & D (Gymnosperms /Xerophytes)
   2 X 4 = 8M
4. Identify the given slides E & F (Gymnosperms /Xerophytes)
   2 X 4 = 8M
5. Technical description of the given plant twig ‘ A ‘
   10M
6. Herbarium
   3M
7. Record
   3M

[Signatures]