PERIYAR UNIVERSITY
PERIYAR PALKALAI
NAGARSALEM – 636011

DEGREE OF BACHELOR OF SCIENCE

CHOICE BASED CREDIT SYSTEM

Syllabus for

B.S.C. BOTANY
(SEMESTER PATTERN )
(For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards)
DEFINITION

PROGRAMME:

“Programme” means core degrees offered in various disciplines.

COURSE:

“Course” refers to the courses offered under the degree programme spread over the complete Programme of study as under.

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part I</td>
<td>Refers Foundation “Tamil/other languages” offered under the programme.</td>
</tr>
<tr>
<td>Part II</td>
<td>Refers Foundation “Communicative English” offered under the programme.</td>
</tr>
<tr>
<td>Part III</td>
<td>Refers “the core subjects” related to the programme concerned including Practicals.</td>
</tr>
<tr>
<td>Part III Allied</td>
<td>Refers “Allied subjects” offered as allied, which is interdisciplinary in nature but related to the programme.</td>
</tr>
<tr>
<td>Part III Electives</td>
<td>Includes “Core/Elective subjects” related to the core subjects of the programme concerned.</td>
</tr>
<tr>
<td>Part IV (i)</td>
<td>“Non-Major Electives” means option is being given to students who do not come under the above two categories (i &amp; ii).</td>
</tr>
<tr>
<td>(ii)</td>
<td>Skill based subject means the courses offered under the programme related to Advanced Skill acquisition for industrial application for which a separate Diploma will be awarded along with the Degree.</td>
</tr>
<tr>
<td>(iv)</td>
<td>“Foundation Course” means courses offered as 1) Environmental Studies (1st year) 2) Value Education - Yoga (1st year) 3) Professional English for Life 4) Science</td>
</tr>
<tr>
<td>Part V</td>
<td>“Extension Activities” means all those activities which form part of NSS/NCC/Sports/YRC and other co and extracurricular activities.</td>
</tr>
</tbody>
</table>
B.Sc. BOTANY

A detailed explanation of the above with relevant credits are given under “Scheme of Examination along with Distribution of Marks and Credits”

**Duration of the Course:**
Currently for the undergraduate programme the duration of study is THREE years. The course of the degree of Bachelor of Science shall consist three academic years divided into six semesters. Practical examinations will be at the end of even semesters. These regulations apply to the regular course of study in approved institutions of the University.

**Credits:**
Means the weightage given to each course of study (subjects) attributed by the experts of the Board of Studies concerned.

**Credit System:**
Means, the course of study under this pattern, where weightage of credits are spread over to different semesters during the period of study and the Cumulative Grade Point Average will be awarded based on the credits earned by the students. The following are the total credit points:

For Undergraduate Programme (Three years) : 148

**AIM AND SCOPE OF THE COURSE:**

1. To acquire knowledge in different areas of plant science.

2. The topics included in different units of different papers would enable the students to develop technical skills in Basic Botany and its applied branches.

3. Skill based subjects like Mushroom Technology, Horticulture, Plant Tissue Culture, Agriculture Microbiology, Plant Breeding and Plant utilization as food, Medicoethnobotany and Seed Technology have been included in order to provide opportunities in employment and research in Government and Private Organizations.

4. The above courses also provide foundation for entrepreneurship.

5. Practicals included in the syllabus will improve the skills of the students in Microscopic techniques, Observations, Drawing and Physiological and Ecological Laboratory techniques.
ELIGIBILITY FOR ADMISSION:

Candidate for admission to the first year of the degree of Bachelor of Science Course shall be required to have passed the Higher secondary examination (Academic or vocational stream with Botany/Biology along with Chemistry under higher secondary board of examination Stream) conducted by the Government of Tamil Nadu or an Examination accepted by the Syndicate, Subject to such conditions may be prescribed therefore shall be permitted to appear and qualify for B.Sc degree examination in Botany.
PERIYAR UNIVERSITY

DURATION OF THE COURSE:

The course for the degree of Bachelor of Science shall consist of three academic years divided into six semesters. Each semester consists of 90 working days.

PASSING MINIMUM:

The candidate shall be declared to have passed the examinations if he/she secures not less than 40 marks.

DISTRIBUTION OF MARKS:

**THEORY**

University examination = 75 marks  
Internal assessment = 25 marks

**INTERNAL ASSESSMENT STRUCTURE:**

Test = 15 marks  
Assignments = 05 marks  
Attendance = 05 marks  
Passing minimum for Internal Assessment = 10 marks

Passing minimum of University examinations = 30 marks

**PRACTICALS**

University Examinations = 60 marks  
Internal Assessment = 40 marks

**INTERNAL ASSESSMENT STRUCTURE:**

Submission - 10 Marks Test - 10 Marks Attendance - 5 Marks Total - 40 Marks  
Submission = 10 marks  
Test = 10 marks  
Regularity in Practical = 10 marks  
Continues assessment = 10 Marks  
Passing minimum for internal assessment = 10 marks  
Passing minimum for University examinations = 30 marks

**CLASSIFICATION OF SUCCESSFUL CANDIDATES:**

- Candidates who secure not less than 60% of the aggregate marks in the whole examinations shall be declared to have passed the examinations in First class.
- Candidates who secure above 50% and below 60% shall be declared to have passed the examinations in Second class.
- Other successful candidates who secure below 50% shall be declared to have passed the examination in Third class.
<table>
<thead>
<tr>
<th>Sem</th>
<th>Part</th>
<th>Course</th>
<th>Code</th>
<th>IntHrs</th>
<th>Credit</th>
<th>Exam Hrs</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>I</td>
<td>Language paper I</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Communicative English paper I</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Professional English I</td>
<td></td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Core Course I (Plant Diversity I)</td>
<td>20UBO01</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Core Course II (Major Practical I)</td>
<td>20UBOP01</td>
<td>3</td>
<td></td>
<td>(Practical Assessment and credit carried to II sem Core Course II)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>First Allied -I</td>
<td></td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First Allied –I Practical</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>Environmental Studies</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>Value Education</td>
<td></td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td></td>
<td>36</td>
<td>20</td>
<td></td>
<td>600</td>
</tr>
<tr>
<td>II</td>
<td>I</td>
<td>Language paper II</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Communicative English paper II</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Professional English II</td>
<td></td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Core Course III (Plant Diversity II)</td>
<td>20UBO02</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Core course II (Major Practical I)</td>
<td>20UBOP01</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>First Allied -III</td>
<td></td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First allied –I (Practical)</td>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>Environmental Studies</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>SBEC I Mushroom Technology</td>
<td>20UBOS01</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td></td>
<td>36</td>
<td>27</td>
<td></td>
<td>800</td>
</tr>
<tr>
<td>III</td>
<td>I</td>
<td>Language paper III</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Communicative English -III</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Core course –IV (Plant Diversity III)</td>
<td>20UBO03</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Core course V (Major Practical II)</td>
<td>20UBOP02</td>
<td>3</td>
<td></td>
<td>(Practical Assessment and credit carried to IV Sem Core Course V)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second Allied –I</td>
<td></td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second Allied practical II</td>
<td></td>
<td>3</td>
<td></td>
<td>(Practical Assessment and credit carried to IV Sem Second allied II)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>SBEC –II (Horticulture)</td>
<td>20UBOS02</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>NMEC-I (Mushroom Culture)</td>
<td>20UBON01</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>VIII</td>
<td>I</td>
<td>Language paper IV</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Communicative English -IV</td>
<td></td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Core course –VI (Anatomy &amp;Embryology of Angiosperms)</td>
<td>20UBO04</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Core course V (Major Practical II)</td>
<td>20UBOP02</td>
<td>3</td>
<td></td>
<td>(Practical Assessment and credit carried to IV Sem Core Course V)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second Allied –II</td>
<td></td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second Allied Practical II</td>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>SBEC –III (Plant Tissue Culture)</td>
<td>20UBOS03</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>NMEC-II Herbal Botany</td>
<td>20UBON02</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>25</td>
</tr>
</tbody>
</table>

Internship Programme: Landscaping and Ornamental Gardening, Organic Farming, Waste Recycling and Vermicomposting, Mushroom Production, Nursery Techniques
<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
<th>Theory</th>
<th>Practicals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B.Sc., Botany</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 24</td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III Core course VII (Morphology &amp; Taxonomy of Angiosperms)</td>
<td>20UBO05</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Core course VIII (Cell Biology)</td>
<td>20UBO06</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Core course IX (Genetics)</td>
<td>20UBO07</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Core course X (Major Practical III) (Core course VII, VII &amp; IX)</td>
<td>20UBOP03</td>
<td>3</td>
<td>(Practical Assessment and credit carried to VI Sem Core Course X)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III Core course XI (Major Practical IV) (Core course X, XI &amp; XII)</td>
<td>20UBOP04</td>
<td>3</td>
<td>(Practical Assessment and credit carried to VI Sem Core Course XI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III Major Elective course I (Plant Biotechnology)</td>
<td>20UBOE01</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>IV SBEC-IV – (Agricultural Microbiology)</td>
<td>20UBOS04</td>
<td>2 2</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>IV SBEC-V-(Plant Breeding &amp; Plant utilization as food)</td>
<td>20UBOS05</td>
<td>2 2</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 24</td>
</tr>
<tr>
<td>VI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III Core course XII (Plant Physiology)</td>
<td>20UBO08</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Core course XIII (Plant Ecology and Plant Geography)</td>
<td>20UBO09</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Core course XIV (Plant Protection)</td>
<td>20UBO10</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Core course X (Major Practical III) (Core course VII, VII &amp; IX)</td>
<td>20UBOP03</td>
<td>3 4</td>
<td>4</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Core course XI (Major Practical IV) (Core course X, XI &amp; XII)</td>
<td>20UBOP04</td>
<td>3 4</td>
<td>4</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>III Major elective course (Biochemistry)</td>
<td>20UBOE02</td>
<td>5 5</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>IV SBEC VI- Medicoethnobotany</td>
<td>20UBOS06</td>
<td>2 2</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>IV SBCE VII- Seed Technology</td>
<td>20UBOS07</td>
<td>2 2</td>
<td>3</td>
<td>25</td>
<td>75 100</td>
</tr>
<tr>
<td>IV Extension Activities</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 32</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>148</td>
</tr>
</tbody>
</table>
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/5 Credit /5hrs/week/75hrs/ I SEM

SEMESTER -I
CORE COURSE–I  SUBJECT CODE: 21UBO01
PLANT DIVERSITY –I
(ALGAE & BRYOPHYTES)

ALGAE

UNIT I  15 hrs
Habit and habitats of freshwater, marine and soil algae.
Pigmentation and Reserve food in algae.
Economic importance of Algae – Agar-Agar, Carrageenan, Single cell protein(SCP)- Chlorellin, Algae in sewage Disposal , Algae as Food and Fodder, Diatomite.
Significant contributions of important phycologists (F.E. Fritsch, T.V. Desikachary, M.O.P.Iyengar).

UNIT II  15hrs
A detailed study of Structure, Reproduction and life cycle of the following algae genera:
Cyanophyceae: Oscillatoria, Anabaena,
Chlorophyceae: Chlamydomonas, Volvox and Oedogonium
Chlorophyceae: Caulerpa, Chara,

UNIT III  15hrs
A detailed study of Structure, Reproduction and life cycle of the following algae genera:
Xanthophyceae: Vaucheria
Bacillariophyceae: Cyclotella,
Phaeophyceae: Sargassum
Rhodophyceae: Gracilaria

BRYOPHYTES

UNIT IV  15hrs
Bryophytes-General characteristics. Occurrence, Distribution and Classification (Rothmaler, 1951) of Bryophytes.
A detailed study of the Structure, Reproduction and life cycles of the following genera – Marchantia

UNIT V  15hrs
A detailed study of the Structure, Reproduction and life cycles of the following genera Porella, Anthoceros and Polytrichum.
Evolution of sporophytes of Bryophytes. Economic importance of Bryophytes.
PRACTICAL: 3hrs/Week
1. Micro preparation and detailed microscopic analysis of vegetative and reproductive parts of the following Algae - *Oscillatoria, Anabaena, Chlamydomonas, Volvox, Oedogonium, Caulerpa, Chara, Vaucheria, Cyclotella, Sargassum and Gracilaria*.

2. Micro preparation and detailed microscopic analysis of vegetative and reproductive parts of the following Bryophytes – *Marchantia, Porella, Anthoceros and Polytrichum*.


ALGAE

Text Books

References

BRYOPHYTES

Text Books

References
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/ 5 Credit /5hrs/Week/75hrs/II SEM
SEMESTER –II
CORE COURSE –III  SUBJECT CODE: 21UBO02
PLANT DIVERSITY –II
(FUNGI, LICHENS, BACTREIA AND VIRUSES)

FUNGI

UNIT I 15hrs

UNIT II 15hrs
Detailed study of occurrence, Morphology, Reproduction, Lifecycle and Economic importance of the following genera:
- Oomycetes: Albugo,
- Hemiascomycetes: Saccharomyces,
- Plectomycetes: Aspergillus/Eurotium,
- Pyrenomycetes: Neurospora,
- Discomycetes: Peziza.

UNIT III 15hrs
Detailed study of Occurrence, Morphology, Reproduction, Life cycle and Economic importance of the following genera:
- Teliomycetes: Puccinia,
- Hymenomycetes; Polyporus and
- Deuteromycetes: Cercospora

LICHENS AND VIRUSES

UNIT IV 15hrs
Lichens: General characteristics, Occurrence, Distribution, Classification, Reproduction and Economic importance of Lichens. Detailed study of Usnea.
Viruses: General characters of Plant viruses.
General structure with special reference to viroids and prions;
General account of Bacteriophages –Cyanophages, Mycophages. Reproduction of T4 phage

BACTERIA

UNIT V 15hrs
Bacteria – Major characteristics, Occurrence, Distribution, Classification of Bacteria.
Morphology of Bacterial cell – Ultra structure of Bacterial cell.
Mode of nutrition in bacteria – Photosynthetic and chemosynthetic.
Growth and Reproduction in Bacteria.
Wall-less forms (mycoplasma)
Economic importance of bacteria.

PRACTICAL: 3hrs /Week
1. Micro preparation and Detailed microscopic analysis of Vegetative and Reproductive Parts of the following Fungi- *Albugo*, *Saccharomyces*, *Aspergillus*, *Neurospora*, *Peziza*, *Puccinia*, *Polyporus* and *Cercospora*.
2. Micro preparation and detailed microscopic analysis of vegetative and Reproductive Parts of the *Usnea*.
3. Study of viruses, viroids and prions using electron micrographs (photographs).
4. Study of Structure of Bacteria using permanent slides / photographs.
6. Economic importance of bacteria: Lactobacillus

Fungi
Text Books

References

LICHENS
References

BACTERIA
Text Books
References

VIRUSES
Text Books

References
UNIT I

Introduction - history of mushroom technology.
Scope of edible mushroom cultivation.
Types of edible mushrooms available in India - temperate mushroom, sub-tropical mushroom and tropical mushroom.
Detail study of *Pleurotus citrinopileatus*, *Agaricus bisporus*.

UNIT II

Pure culture - preparation of medium (PDA and Oatmeal agar medium).
Sterilization.
Preparation of test tube slants to store mother culture.
Culturing of *Pleurotus* mycelium on Petri plates.
Preparation of mother spawns in saline bottle and polypropylene bag and their multiplication.

UNIT III

Cultivation Technology: Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hood, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house), water sprayer, tray, small polythene bag.
Mushroom bed preparation - paddy straw, sugarcane trash.
Factors affecting the mushroom bed preparation - Low cost technology.

UNIT IV

Storage and nutrition: Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickels, pappads), drying, storage in salt solutions.
Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins.
Medicinal values of mushrooms

UNIT V

Food Preparation: Types of foods prepared from mushroom; Soup, Cutlet, Omelets, Samosa, Pickles, Curry.
Value added products of mushroom– mushroom soup powder, mushroom biscuit, mushroom nuggets, mushroom ketchup, candy, murabba, chips etc.
Research Centers - National level and Regional level.
Cost benefit ratio - Marketing in India and abroad, Export Value.
References:
UNIT I  
10 hrs
Pteridophytes: General characteristics
Classification (Reimers 1954).
Sporangial organization – Homospory, Heterospory and seed habit.
Apospory and Apogamy.
Stelar evolution.
Ecological and economic importance of Pteridophytes

UNIT II  
10 hrs

UNIT III  
10 hrs
Morphology, Anatomy, Reproduction and life cycle of Gleichenia, Adiantum and Marsilea

UNIT IV  
15 hrs
Gymnosperms-General Characteristics,
Classification(Pilger and Melchior,1954).
Morphology, anatomy and reproduction of Cycas and Pinus.
Economic importance.

UNIT V  
15hrs
Gymnosperm and Paleobotany:
Detailed study of the Gnetum.
Paleobotany – Geological time scale, Radiocarbon dating
Fossilization process.
Brief study of the following fossils: Lepidodendron, Lepidocarpon, Calamites, Williamsonia.

PRACTICAL 3HRS /Week
1. Study of the Habit, TS of leaf and Stem, Morphology of Reproductive structures of following Pteridophytes: Lycopodium, Selaginella, Equisetum, Gleichenia, Adiantum and Marsilea
2. Study of the Habit, TS of leaf and stem, Morphology of Reproductive structures of following gymnosperm genera Cycas, Pinus and Gnetum.
3 Study the following fossil members: Lepidodendron, Lepidocarpon, Calamites, Williamsonia through permanent slides/photographs.
Text Books
Ltd., Delhi.
Vasishta BR, Sinha AK & Anilkumar. (2005). Botany for degree students:
Pteridophytes. S Chand, New Delhi.
(Pteridophyta), S.Chand & Co Pvt Ltd.
Vasishta PC, Sinha AK & Anilkumar. (2005). Botany for degree students:

References
York.
Chamberlin, C.J. (1934). Gymnosperms: structure and Evolution. Chicago reprinted
Co., New Delhi.
Delhi.
Institute of Paleobotany, Lucknow, India.
New Delhi.
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/2 Credit /2hrs/Week/30hrs/III SEM

SEMESTER –III
SKILLED BASED ELECTIVE COURSE –II, SUBJECT CODE: 21UBOS02
HORTICULTURE

UNIT I
Fundamentals of Horticulture: Definition, Branches, Importance and Scope.
Classification of Horticultural Crops: fruits and vegetables.
Gardening: Definition, objectives and scope - different types of gardening- Formal, informal and kitchen garden.

UNIT II
Plant propagation: Cutting, layering, Budding and grafting. Selection and significance of Stock and scion.
Role of plant growth regulator in Horticulture: Induction of Rooting, flowering, Fruit set, Fruit development.

UNIT III
Soil bed preparation, Potting, Repotting, Weeding, Pruning, Topiary.
Lawn making: Types of lawn grasses, maintenance of lawn.
Hedge plant and its importance.

UNIT IV
Floriculture: Importance and Scope of Floriculture.
Commercial Floriculture: Production and packaging of cut flowers
Flower arrangements: Methods to prolong vase life
Cultivation of Important cut flowers (Chrysanthemum, Jasmine, Rose).
Ikebana.

UNIT V
Ornamental gardens: Flowering annuals; Herbaceous, perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms.
Ornamental garden: Green House, Water garden, Rockery.
Bonsai techniques.

HORTICULTURE

Text Books
References
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/2 Credit /2hrs/Week/30hrs/III SEM

SEMESTER- III
NON – MAJOR ELECTIVE COURSE – I  SUBJECT CODE: 21UBON01
MUSHROOM CULTURE

UNIT I 6hrs
Introduction, History. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India -  *Pleurotus citrinopileatus*, *Agaricus bisporus*.

UNIT II 6hrs
Pure culture: Preparation of Medium (Potato dextrose and Oatmeal Agar medium), Sterilization culturing of *Pleurotus* mycelium on test tube Slants, Petri plate. Preparation of mother spawns in saline bottle and poly propylene bag. Substrate for spawn preparation (cereal grain, coir pith)

UNIT III 6hrs

UNIT IV 6hrs
Storage and nutrition: Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickels, pappads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content – Vitamins

UNIT V 6 hrs
Food Preparation: Types of foods prepared from mushroom. Research Centre - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

References
ANATOMY

UNIT – I

Meristems: Classification, distribution, structure and function.
Shoot apex and Root apex organization. Theories: Histogen, Tunica – Corpus and quiescent center.
Simple permanent tissues: Parenchyma, Collenchyma, Sclerenchyma. (Fibers and Sclereids)

UNIT – II

Complex tissues: Xylem – Tracheids, Vessels, Xylem fibres and Xylem parenchyma.
Secondary Xylem, Annual rings, Heart wood and Sap wood, Tyloses.
Phloem: Sieve elements, companion cells, phloemfibre and phloem parenchyma.
Secondary phloem.
Epidermal tissues: Stomatal types: Anomocytic, Anisocytic, Paracytic, Diaecytic and Graminaceous.
Ground tissues and vascular tissues- types.
Trichomes- Types.

UNIT – III

Primary and secondary structure of Dicot Stem and Root.
Anomalous secondary growth in stems of *Nyctanthes, Boerhaavia, Dracaena*.
Anomalous secondary growth in roots of *Beta vulgaris*
Primary structure of monocot stem and root.
Structure of Dicot and Monocot leaf.
Nodal anatomy – Uni, tri and multilacunar node.

EMBRYOLOGY OF ANGIOSPERMS

UNIT – IV

Structure and development of Anther.
Development of male gametophyte.
Types of ovules. Nucellus.
Development of Female gametophyte: Monosporic (*Polygonum)*.

UNIT – V

A brief account on pollination, Fertilization, Double fertilization and Triple fusion.
Endosperm: Nuclear, Cellular, Helobial and Ruminate.
Endosperm haustoria.
Development of Embryo in Dicot (*Capsella-bursa pastoris*).
Polyembryony.
PRACTICALS
ANATOMY OF ANGIOSPERMS
1. Study of simple and complex tissues by using permanent slides.
2. Study of primary structure and sectioning of Dicot stem, root, leaf, Monocot stem, root and leaf.
4. Anomalous secondary structures – *Nyctanthes, Boerhaavia Dracaena and Beta vulgaris*. (Permanent slides)
5. Stomatal types: Anomocytic, Anisocytic, Paracytic, Diacytic and Graminaceous. (Peel out from leaf).

EMBRYOLOGY OF ANGIOSPERMS
1. Structure of Anther (Young and Mature from *Datura or Cassia flower*)
2. Types of ovules: Anatropous, Orthotropous, Circinotropous, Amphitropous, Campylotropous. (Permanent slides).
3. Stages in Microsporogesis and Megasporogensis (Permanent slides onion flower Bud).
4. Structure of Male gametophyte and Female gametophyte (Permanent Slides/photographs).
5. Dissection of embryo and observe the globular and Heart shape
6. Structure of Endosperm. Nuclear (Coconut water) cellular endosperm (Cucumber seed) Ruminate (fruit of *Arecha catechu*)

ANATOMY
Text Books

References

EMBRYOLOGY
Text Books

References
UNIT I

Introduction to Plant Tissue culture- Historical background.
Principle – Polarity, Symmetry and Totipotency, Morphogenetic Centres of origin and organization-differentiation–dedifferentiation and re-differentiation; vascular differentiations.
Laboratory organization, Tools and techniques, methods of sterilization. Laboratory contaminants- it’s control and measures.

UNIT II


UNIT III

Types of culture - Cell, tissue and organ culture – Callus induction, subculture and maintenance. Isolation of single cells, selection and types of cells. Cell suspension cultures -Batch, continuous. Synchronization of suspension culture.

UNIT IV


UNIT V

Production of secondary metabolites – Alkaloids.

Text Books


References

PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/2 Credit /2hrs/Week/30 hrs./VSEM

SEMESTER –IV
NON –MAJOR ELECTIVE –II  SUBJECT CODE: 21UBON02
HERBAL BOTANY

UNIT I
6hrs
Herbal medicines: History and scope – Indian system of medicines – Siddha, Ayurvedha
and Unani systems.
Classification of Crude drugs.

UNIT II
6 hrs
Organized drugs –Drugs obtained from Wood – *Ephedra*.
Drugs obtained from Barks– *Cinchona*.
Drugs obtained from Roots and Rhizomes – *Catheranthus, Rauwolfia* and *Ginger*.

UNIT III
6hrs
Drugs obtained from leaves -*Aloe vera, Gymnema sylvestre, Ocimum sanctum*.
Drugs Obtained from Flower –*Syzygium aromaticum*.
Drugs from fruits –*Coriandrum sativum*.
Drugs from Seed –*Strychnos nux vomica*.
Plants and Herbs– *Bacopa monnieri, Andrographis paniculata*

UNIT IV
6 hrs
Pharmacological action of plant drugs-action on the autonomic nervous system, central
nervous system(*Mucuna pruriens, Withania somnifera*)
Heart, muscle, Blood vessels (*Terminalia arjuna, Azadirachta indica*).
Gastro-intestinal tract (*Curcuma longa, Foeniculum vulgare*)

UNIT V
6 hrs
Collection of crude drugs-Harvesting of crude drugs-
Drying of crude drugs (Natural drying and artificial drying)
Garbling-packing of crude drugs
Storage of crude drug.
Marketing.
Drug adulteration.

Text books
Vallioor, Tirunelveli.
Agrobios Publications, Jodhpur.
Kumar, NC (1993). An Introduction to Medical Botany and Pharmacognosy.
Chopra RN, Nayar SL and Chopra IC (1956). Glossary of Indian medicinal plants. CSIR,
New Delhi.
References
UNIT I  
10 hrs
The plant body (Parts). Root types and Modification. 
Stem – Types Aerial and underground Stem modification. 
Leaf: Morphology; Types; Venation; Phyllotaxy.

UNIT II  
15hrs
Inflorescence: Racemose types - Cymose types - Special type. 
Morphology of flower- Flower as modified-shoot 
detailed structure of flowers-floral parts-their arrangement, Relative position, symmetry, 
Aestivation and placentation types- Floral Diagram and Floral Formula. 
Fruits: Types and classification

UNIT III  
15hrs
Aim, Scope and Significance of taxonomy 
System of Classification- Artificial (Linnaeus), Natural system (Bentham and Hooker) 
and Phylogenetic (Engler and Prantl) 
Angiosperm Phylogeny Group system 2009(APG IV) (Introduction only). 
Only outline of Classification with merits and Demerits need be indicated. 
Plant nomenclature- Binomial, ICBN/ICN - Principles-Rule of priority and author citation. Type concept. 
Herbarium technique- Preparation of herbarium, their preservation. 
Important herbaria, Flora and uses.

UNIT IV  
20 hrs
Detailed study of families: Study the following families of Bentham and Hooker’s system 
with special reference to their morphological and floral characters. Special attention 
should be given to common and economically important plants within the families, 
Annonaceae, Capparidaceae, Rutaceae, Leguminosae (Mimosaceae, Caesalpiniaiceae and Fabaceae), Myrtaceae, Cucurbitaceae, Apiaceae,

UNIT V  
20 hrs
Detailed study of families: Study the following families of Bentham and Hooker's System w.s.r.t. their morphological and floral characters. Special attention should be given to common and economically important plants within the families:Apocyanceae, Asclepiadaceae, Verbenaceae, Lamiaceae, Euphorbiaceae, Orchidaceae, Liliaceae, Poaceae.

PRACTICAL 3hrs /Week 
1.Describe the plant parts with suitable plants- Technical term habit, habitat form….types
of leaves, with leaf shape, margin, texture, modification of leaf.
2. Study the Types and modification of root and stem with suitable example
   Identify the following inflorescence and fruits:
   (a) Inflorescence - Simple raceme, Spike, Corymb, Head, simple cyme, Cyathium
       And Hypanthodium.
   (b) Fruits
3. Floral formula from floral description.
   1. Identify the families mentioned in the syllabus by noting their vegetative and floral
      Characters.
   2. Students must describe the floral parts, draw the L.S., floral diagram and write the
      floral formula of at least one flower from each family
4. Study the products of plants mentioned in the syllabus of economic botany with Special
   reference to the morphology, botanical name and family.
5. Prepare **herbarium of 15 plants** with field notes (internal assessment).
6. Conduct field trips for a minimum of 3 to 5 days under the guidance of a teacher and
   Submit field report.

**Text Books**

**References**
SEMESTER – V  
CORE COURSE – VIII SUBJECT CODE 21UBO06  
CELL BIOLOGY  

CYTOLOGY  
UNIT I  
History and Development of cell biology. 
Cell as a unit of structure and function;  
Characteristics of prokaryotic and eukaryotic cells  

Unit II  
Ultra structure of a Plant cell. 
Cell wall Chemistry, structure and function of Plant cell wall. 
Plasma membrane. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis  

Unit III  
Endomembrane system: Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing; 
Smooth ER and lipid synthesis, export of proteins and lipids;  
Golgi Apparatus – organization, protein glycosylation, protein sorting and export from Golgi Apparatus;  
Ribosome; Lysosomes  
Cellular inclusions- Starch grains, Aleurone grains, Inulin Crystals, Raphides and Cystoliths.  

Unit IV  
15 hrs  
Cell organelles  
Nucleus: Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus.  
Chloroplast and mitochondria: Structural organization; Function;  
Semi-autonomous nature of mitochondria and chloroplast.  

UNIT V  
15hrs  
Chromosomes –Morphology, Structure of Polytene, Lampbrush and B-chromosomes. Nucleic acid –Structure and types of DNA and RNA, Nucleosomes. Replication-DNA.  
Gene regulation – Lac operon.
PRACTICAL 3hrs /week
1. To observe the plant cell structure with onion epidermal peel out.
2. Study of the photomicrographs of cell organelles
3. Microscopic view of cell organelles in plant cells – Chloroplast (Hydrila leaf)
4. Starch grains (potato), Aleurone grains (wheat), Inulin Crystals(potato), Raphides (Petiole–Colacasia/Nymphaea) and Cystoliths–(leaf peel out -Ficus/Momordica).
5. Study the polytene and lamp brush chromosome structure through photograph
6. Identification of different stages of mitosis by using squash and smear techniques – Onion Root tip.

Text Books

References
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-225Credit /5hr/Week/75/VSEM
SEMESTER –V
CORE COURSE IX SUBJECT CODE: 21UBO07
GENETICS and PLANT BREEDING

GENETICS

UNIT I

UNIT II
Linkage and crossing over,
Cytological basis of crossing over, mapping of genes on chromosomes, Sex linkage in Drosophila (Eye color) and Humans (color blindness). Cytoplasmic inheritance (Plastid inheritance, Mitochondria- male sterility in maize)

UNIT III
Sex determination in plants.
Mutations.
Chromosome aberrations- deficiencies, duplications, inversions, translocations.
Polypl oid types- aneuploids, euploids and allopolyploids.
Population genetics- Hardy – Weinberg principle.

PLANT BREEDING

UNIT IV
Plant Breeding: Historical aspect of plant breeding. Objectives of plant breeding.
Breeding Methods: Plant introduction - Types and procedures
Centers of diversity and origin of cultivated plants Vavilov’s centres of origin.
Acclimatization.
Selection methods, (pure line, clonal and mass)

UNIT V
Hybridization: Types and procedure of hybridization.
Heterosis, Hybrid vigour. Somatic hybridization.
Anther culture and its Role in plant breeding.
Role of mutation and polyploidy in plant breeding.

PRACTICAL 3hr /Week
1. Simple problems of monohybrid and Dihybrid ratios and factor interaction
2. Construction of chromosome map – three point test cross.
3. Demonstration of Hybridization technique.

Text Books

References
Lewin (2007). Gene IX. Jones and Barlett Pub.ISBN. O 7637 5222 3

PLANT BREEDING
Text Books
PERIYAR UNIVERSITY, SALEM – 636011

B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/Credit /5hrs/Week/75hrs/V SEM

SEMIESTER –V

MAJOR ELECTIVE COURSES I – SUBJECT CODE:21UBOE01

PLANT AND ENVIRONMENTAL BIOTECHNOLOGY

UNIT I
Biotechnology – History, scope and significance.
Recombinant DNA technology. Role of Restriction enzymes.
Cloning vectors – Plasmid, Cosmids, Bacteriophages. Transposons.
Applications of Genetic Engineering.

UNIT II
Gene transfer in plants - Aims, strategies for development of transgenic plants.
Direct gene transfer methods- Electrophoration, Lipofection and Microinjection.
Indirect gene transfer– Agrobacterium mediated gene transfer.
Advantages and disadvantages of transgenic plant

UNIT III
Techniques and application of biotechnology – Polymerase chain reaction: Principle and Application of PCR and RTPCR.
–DNA Sequencing – Sanger’s method.
Introduction and application of molecular marker’s–brief account DNA finger printing and Bar coding of plants.

UNIT IV
Genes of agronomic interest and transgenic crops: Golden rice, Bt cotton and Bt brinjal.
Disease resistance.
Biosafety and bioethics of transgenic plants.
Enhancement of shelf life of flowers and fruits.

UNIT V
Environmental Biotechnology: Biodiversity and conversation.
Waste management - Solid waste; waste water, Biogas and phytoremediation(only outline).
Industrial biotechnology– Bioethanol, Food biotechnology –SCP.
Improved food and food products

Text Books
Saraswathi Purohit for student Edition, India.
References
Introduction to genetic engineering. 6th Ed Blackwell oxford.
UNIT I 6hrs

UNIT II 6hrs

UNIT III 6hrs
Azotobacter - Isolation, Mass production and Field application. Cyanobacteria (blue green algae), *Azolla* and *Anabaena azollae* association, nitrogen fixation, factors affecting growth, Blue green algae and *Azolla* in rice cultivation.

UNIT IV 6hrs

UNIT V 6hrs
Organic farming- green manuring and organic fertilizers, recycling of biodegradable municipal, agricultural and industrial wastes- Biocompost making methods, types and methods of vermicomposting- field application.

References
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/ 2Credit /2hrs/Week/30hr/SEM

SEMESTER V

SKILL BASED ELECTIVE COURSE – V SUBJECT CODE: 21UBOS05
BIOLOGICAL TECHNIQUES AND COMPUTER APPLICATION

UNIT I 6hrs

UNIT II 6hrs
Micro technique – preparation for microscopic observation – Whole mount, Smears, Squash, sections.

UNIT III 6hrs

UNIT IV 6hrs
Biostatistics – Statistics data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean, Standard deviation, ANOVA, SPSS.

UNIT V 6hrs
Computer application in the Art of Scientific Presentation-Numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Microsoft word for assignment and project work. Microsoft excel for tabular and graph work. Microsoft Power Point Presentation for preparing slides Poster presentation.

Text Books

References
UNIT I

Plant water relations - Diffusion, imbibition, osmosis, OP, DPD, TP, WP.
Absorption of water and Mineral – Active absorption and passive absorption.
Ascent of sap.
Transpiration – types, mechanism of stomatal movement.
Factors affecting transpiration. Guttation.
Role of macro and microelements.

UNIT II


UNIT III


UNIT IV


UNIT V


PRACTICAL 3Hrs /Week

1. Determination of DPD by using Rheo leaf /Onion leaf
2. Effect of temperature on Membrane permeability
3. Effect of chemical on Membrane permeability
4. Calculation of stomatal index and stomatal frequency of a mesophyte and a Xerophyte
5. Effect of light on transpiration using Ganong’s spotometer
7. To study the effect of light intensity on Photosynthesis by using Wilmott’s bubbler
8. To study the effect of and concentration of CO₂ on Photosynthesis by using Wilmott’s bubbler
9. Measurement of rate of respiration in germinating seed using Simple Respiroscope
10. Measurement of rate of respiration in flower buds using Simple Respiroscope

Text Books


References

UNIT I
Approaches to the study of ecology- autecology and syneclology. Plant environment: climatic, edaphic and biotic factors.

UNIT II

UNIT III

UNIT IV
Environmental pollution- introduction, definition;
Air pollution- air pollutants, types, sources, effect of air pollution on plants and humans, control measures.
Water pollution-water pollutants, types, sources, impact. Control measures.
Eutrophication.
Soil Pollution- causes, sources, solid waste, biodegradable, non-biodegradable, waste dumps, municipal waste, Agrochemical management of solid waste, Composting, e – waste.

UNIT V
Definition, Concept, Scope and significance of phytogeography.
Phytogeographical zones of India.
Vegetatational types in Tamilnadu.
Hotspots – Endemic distribution, Age and Area Hypothesis.
Continental drift theory. Conservation – Insitu and Ex situ.

PRACTICALS 3Hrs/ Week
1. Study of the morphological and structural adaptation of locally available hydrophytes, Mesophytes, xerophytes to correlate to the particular habitat.
2. Determination of Dissolved oxygen in water
3. Determination of dissolved carbon di oxide in water.
Text Books

References
Good, R. (1997). The Geography of flowering Plants (2nd Edn.) Longmans,
UNIT I 15 hrs
Types of insects causing damage to crop. Nature and classification of plant nematodes. Damage to crops of India by Insects, Nematodes, Rodents, Fungi, Bacteria and viruses - a general outline.

UNIT II 15 hrs
Types of plant diseases and causal agents. A general account of preventive measures of plant diseases including plant protection and quarantine measures. Legislations in plant protection, seed certification, weed control.

UNIT III 15 hrs
Study of symptoms, etiology and control measures of the following diseases: damping off of seedling, bud rot of coconut, black rust of wheat, blast of paddy, smut of maize, Tikka disease of groundnut.

UNIT IV 15 hrs

UNIT V 15 hrs

PRACTICAL
2. Study of fungal, bacterial and viral diseases mentioned in the syllabus.
3. Handling of plant protection appliances (Dusters, sprayers, and other appliances.)
4. Preparation of 5 herbarium sheets of Pathology – specimens studied

Text Books
Rangaswami, G (1999). Disease of Crop plants of India. Prentice Hall of India Pvt. Ltd.
UNIT I 15hrs

UNIT II 15hrs
Carbohydrates: Structure and properties of Mono - Disaccharides, polysaccharides. Chemical structure and function of starch and cellulose.

UNIT III 15hrs

UNIT IV 15hrs
Enzymes: Nomenclature, classification - mechanism and regulation of enzyme action, enzyme kinetics, factors affecting enzymatic action.

UNIT V 15hrs
Lipids - structure of simple lipid and compound lipid (phospholipids and glycolipids), fatty acids- saturated and unsaturated fatty acids- Secondary carbon metabolism and the metabolites: Polyphenolics - Terpenoids and Alkaloids.

Text Books

References
PU- B.Sc., Botany (College), 2020-21/ 2 Credit /2hrs/Week/30 hrs/SEM.
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/5Credit /5hrs/Week/75hrs/VI SEM

SEMESTER –VI
SKILL BASED ELCTIVE COURSE –VI
SUBJECT CODE :21UBOS06
MEDICO- ETHNO BOTANY

UNIT I

6hrs
History. Scope and Importance of Medicinal Plants. Indigenous Medicinal Sciences - Definition and Scope- Ayurveda, Siddha and Unani medicine; History and concept. Classification of natural drugs, (Alphabetical, Morphological, Taxonomical, Chemical and Pharmacological)

UNIT II

6hrs

UNIT III

6hrs
Role of ethnobotany in modern Medicine-Medico-ethnobotanical sources in India; Significance of the following plants in ethnobotanical practices (along with their habitat and morphology) a) Azadirachta indica (b) Ocimum sanctum (c) Vitex negundo (d) Gloriosa superba (e) Tribulus terrestris (f) Pongamia pinnata (g) Cassia auriculata (h) Indigofera tinctoria.
Role of ethnobotany in modern medicine with special example Rauvolfia serpentina, Trichopus zeylanicus, Artemisia, Withania.

UNIT IV

6hrs
Drugs obtained from leaves - Aloe vera, Gymnema sylvestre, Ocimum sanctum.
Drugs Obtained from Flower- Syzygium aromaticum.
Drugs from fruits - Coriandrum sativum.
Drugs from Seed Strychnos nux vomica.
Plants and Herbs– Bacopa monnieri, Andrographis paniculata

UNIT V

6hrs
Drug adulteration. Drug evaluation: Chemical and Biological. Phytochemical investigations. Quality control of herbal drugs. Role of NMPB, AYUSH and CDRI.
Text Books

References
SEMINER – VI
SKILL BASED ELECTIVE COURSES - VII
SUBJECT CODE: 21UBOS07
SEED TECHNOLOGY

UNIT I  6hrs
Floral biology. Seed formation. Seed morphology and structural details of Dicot (Castor) and Monocot (Paddy) seeds. Roles and goals of seed technology, importance of quality seeds in agriculture, characteristics of quality seed.

UNIT II  6hrs

UNIT III  6hrs
Seed viability – Topographical tetrazolium or T2 test embryo excision method. Seed moisture – Importance – methods of moisture determination - basic methods.

UNIT IV  6hrs
Certified seed production of the following: Paddy, groundnut and cotton.

UNIT V  6hrs

References:
FIRST ALLIED COURSE – I  SUBJECT CODE :21UBOA01
THALLOPHYTES, BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS,
PLANT PHYSIOLOGY AND ECOLOGY.

UNIT I 12 hrs
Thallophytes: Algae: general characters. Study of the structure and life cycle of the
following genera-Oscillatoria, Oedogonium, Sargassum and Polysiphonia.
Fungi: General Characters. Study of the structure and life cycle of the following genera
Albigo, Penicillum and Agaricus. Economic importance of fungi

UNIT II 12hrs
A general study of Bacteria and viruses. Economic importance of bacteria.
Bryophytes: General Characters. Study of the structure and life cycle of Marchantia.

UNIT III 12hrs
Pteridophytes and Gymnosperms: Structure and lifecycle of Lycopodium and Cycas.

UNIT IV 12 hrs
Plant Physiology: Osmosis, absorption of water. Photosynthesis-Light reaction, Calvin cycle.
Transpiration—types, mechanism of stomatal movement.
Nitrogen cycle.
Hormones (Auxins only).

UNIT V 12 hrs
Plant Ecology: Factors affecting vegetation - climatic, edaphic and biotic. Morphological
and anatomical adaptations in Hydrophytes and Xerophytes

Text books

Calcutta.
Palaniappan, S. (1985) . Thavaraviyal Thunaippaadam (Tamil), Mohan Padippagam,
Chennai.
New Delhi.
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22/4 Credit /4hrs/Week/60hrs/SEM

ALLIED BOTANY
FIRST ALLIED COURSE – II SUBJECT CODE: 21UBOA02
EXTERNAL MORPHOLOGY, TAXONOMY OF ANGIOSPERMS, CYTOLOGY,
GENETICS, ANATOMY AND EMBRYOLOGY.

UNIT I 12hrs
Morphology of Plant: Plant and its parts. Structure and function of Root and Stem.
Leaf and its parts. Phyllotaxy. Types of leaf – simple and compound. Terminology with
reference to leaf description. Inflorescence - Racemose, Cymose, Special types.
Terminology with reference to flower description.

UNIT II 12hrs
Taxonomy: Bentham and Hooker’s system of classification. Study of the following
families and their economic importance - Leguminosae, Cucurbitaceae, Rubiaceae,
Asteraceae, Euphorbiaceae and Poaceae.

UNIT III 12hrs
Cytology: Ultra structure of plant cell and brief outline of cell wall, Plasma membrane,
Endoplasmic reticulum, Mitochondria, Chloroplast, Nucleus. Cell division - Mitosis and

UNIT IV 12hrs
Anatomy: Meristem. Simple permanent tissues - Parenchyma, Collenchyma,
Sclerenchyma. Complex permanent tissues - Xylem and Phloem.
Primary structure of Dicot stem, Dicot root and Dicot Leaf. (Mesophytic only)

UNIT V 12hrs
Embryology - Structure and development of anther, male gametophyte. Structure and
development of ovule and female gametophyte (Polygonum type). Fertilization.
Structure and development of dicot embryo (Capsella type).

PRACTICAL
1. To describe in technical terms plants belonging to any of the families prescribed and
   Identify the family.
2. To identify the plant family and morphology of the parts used for the following
   plant Specimens.
   1. Arachis hypogea - Ground nut
   2. Dolichos biflorus - Horse gram
   3. Cicer arietinum - Bengal gram
4. *Pisum sativum* - Pea
5. *Phaseolus mungo*– Blackgram
6. *Phaseolus radiatus*– Greengram
7. *Tamarindus indica* - Fruit
8. *Abras precatorius* - Seed
9. *Acacia concinna*– Soapnut
10. *Luffa aegyptiaca* - Fibrous skeleton of the fruit
11. *Cucumis sativus* - Fruit
12. *Coffea arabica* - Seeds
13. *Ixora* - Flower
14. *Cinchona officinalis* - Plant
15. *Musa Paradisica* – Fruit
16. *Phoenix sylvestris*-Date fruit
17. *Areca catechu*-Nut
18. *Cocos nucifera*-Kernal

3. To make suitable Micropreparations, describe and identify materials of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms prescribed.

4. To describe simple experimental set-up in plant physiology section of the syllabus.

**Text books**

PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

B.Sc., BOTANY MAJOR AND ALLIED BOTAN Y THEORY QUESTION
PAPER MODEL.

B.Sc., Degree Examination, APRIL / NOVEMBER 20__
Time: 3 hrs.                                        Max. Marks: 75

Part - A: (15 x 1 = 15 marks)
Answer all the questions.
Choose the correct answer
(Three questions from each unit)
Q.No. 1- Q.No. 15

Part – B (2x5 = 10 marks )
Answer any TWO questions
Q.No. 16. - UNIT-I
Q.No. 17. - UNIT-II
Q.No. 18 - UNIT-III
Q.No. 19. - UNIT-IV
Q.No. 20. - UNIT-V

Part – C (5x10 = 50 marks)
Answer all the questions.
All Question carry equal marks. Each answer should not exceed 500 words.

Q.No. 21.a (or) B - UNIT-I
Q.No. 22.a (or) B - UNIT-II
Q.No. 23.a (or) B - UNIT-III
Q.No. 24.a (or) B - UNIT-IV
Q.No. 25.a (or) B - UNIT-V
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU-B.Sc., Botany (College), 2021-22

MODEL QUESTION PAPER
B. Sc., Botany Degree Examination
((For Students Admitted from the Academic Year 2021 – 2022 onwards under CBCS Pattern)

CORE COURSE – II. MAJOR PRACTICAL I SUBJECT CODE 21UBOP01
(Covering the core courses I &III)
(ALGAE, BRYOPHYTES, FUNGI, LICHENS, BACTERIA, VIRUSES)

Time : 3 hrs. Maximum: 60 Marks

Practical: 50 Marks

Record : 10 Marks


2. Draw diagrams and write notes of interest on D, E, F, and G. (4X4=16)

3. Name the genus, group and morphology of given part of H, I, and J. (Diagrams not Necessary) 3X3=9

4. Identify and write notes on economic importance of K, L, and M. 2X2=4

Key
A - Algae
B - Fungi
C - Bryophytes
(Preperation-2, Identification -1, Diagram -2, Reason -2) (7X3=21)
D - Algae- slide
E - Fungi- slide
F - Bryophyte-slide
G - Lichens- fruit body Bacteria/ Viruses- electron micrograph
( Identification -1, Diagram -1, Reason -2) (4X4=16)
H - Algae
I - Fungi
J - Bryophytes
(Genus 1, Group 1, Morphology 1) (3X3=9)

K – Algae/Fungi
L- Bacteria/Viruses
(identification 1, importance 1) (2X2=4)
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU-B.Sc., Botany (College), 2020-21

MODEL QUESTION PAPER

B. Sc., Botany Degree Examination
((For Students Admitted from the Academic Year 2021 – 2022 onwards under CBCS Pattern)

CORE COURSE – V. SUBJECT CODE :21UBOP02
MAJOR PRACTICAL II
(Covering the core courses IV&VI)

(PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY; ANATOMY & EMBRYOLOGY
OF ANGIOSPERM)

Time : 3 hrs. Maximum: 60 Marks
Practical: 50 Marks
Record : 10 Marks


2. Make a suitable micro preparation of D. Identify giving reasons. Draw diagrams. Leave the Slides for valuation. (6 marks)

3. Dissect and mount any one of the stages of the given material E.
   (Diagram and notes not necessary) (4 Marks)

4. Name the genus, group and morphology of given part of F and G. (2X3=6 marks)

5. Write notes on H, I, J, K and L. (5X2=10 marks)

KEY

A. Angiosperm – Anatomy – Vegetative part.
B. Pteridophyte – Anatomy – Vegetative part.
C. Gymnosperm - Anatomy – Vegetative part.

(Preparation 2, Identification 1, Diagram 1, Reason 2)
D. Reproductive part – Pteridophyte (or) Gymnosperm.

(Preparation 2, Identification 1, Diagram 1, Reason 2)
E. Embryo – dicot – Tridax - 4 mark.
F. (Slide -3, Identification-1)

F&G. Macroscopic –Pteridophyte (or) Gymnosperm.
(Genus 1, Group 1, Morphology 1) (2X3=6mark)

Model Question Paper

B. Sc., Botany Degree Examination
((For Students Admitted from the Academic Year 2021 – 2022 onwards under CBCS Pattern)

Core Course – XIV.
Subject Code: 21UBOP03

Major Practical III
(Covering the core courses VII, VIII & IX)

Morphology and Taxonomy of Angiosperms, Cell Biology, Genetics, and Plant Breeding

Maximum: 60 Marks
Practical: 45 Marks
Record: 10 Marks
Herbarium: 5 Marks

Time: 3 hrs.

1. Refer A and B to their respective families. Point out the characters on which the identification is based at each level. (Diagrams not necessary) (2X4=8 Marks)

2. Make acetocarmine preparation of C (Squash) any one stage. draw diagram. 4 Marks

3. Describe D in Technical terms. Draw diagrams of the floral parts only. Construct the floral Diagram. Give the floral formula 5 Marks

4. Construct the chromosome map with the data provided E 5 Marks

5. Solve the given genetic problem F and G (2X4=8 Marks)

6. Spot at sight H and I (2X2=4 Marks)

7. Write the name of the genus, species, family and morphology of the useful parts of J and K – (4X2=8 Marks)

8. Briefly describe the plant breeding technique in spotter L 3 Marks

Key

A&B-Family - 2X4=8 marks
C-Onion root tip - preparation =3 marks, diagram -1 marks - 4 marks
D-Plant with flowers –preparation -1 marks, Floral diagram – 2 marks, Floral formula -2 marks - 5 marks
E-Chromosome map - 5 marks
F&G-Genetic problems - 2X3 = 8 marks
H&I-Cytology spotter - Identification -1 marks, Reason -1 2X2=4 marks

J & K-Morphological parts- Genus -1mark, Species -1 marks, family-1mark, Morphology -1 mark
L- Any Plant breeding technique- - 3 marks
MODEL QUESTION PAPER
B. Sc., Botany Degree Examination
((For Students Admitted from the Academic Year 2021 – 2022 onwards under CBCS Pattern)

CORE COURSE – XV
SUBJECT CODE : 21UBOP04
MAJOR PRACTICAL IV
(Covering the core courses XI, XII & XIII)

(PLANT PHYSIOLOGY, PLANT ECOLOGY AND PLANT GEOGRAPHY, PLANT PROTECTION)

Time: 3 hrs. Maximum: 60 Marks
Practical : 50 Marks
Record: 10 Marks.

1. Outline the procedure, apparatus and materials required for investigating the physiological problem A, assigned. Set up the experiment. Tabulate the data obtained and report the results. Leave the set up for valuation. (16 marks)

2. Based on morphological and anatomical characters, assign B and C to their respective probable habitats. Draw suitable diagrams. Submit slides for valuation. 2x8=16

3. Identify the causal organism of the diseased material ‘D’. and ‘E’. Draw diagrams. Describe the symptoms and list the control measures. (2x8=16)

4. Comment on ‘F’ 2 Marks

Key
A- Physiology - Materials – 2 marks, Procedure-4, Setup – 4 marks, Spot Viva- strictly pertained to the concerned physiology experiment- 2 marks-Result - 4marks
B&C Ecology material –preparation -2 marks , identification -1 mark,Diagram-2 reason -3 marks
D, E, - Any disease in the syllabus - Name disease – 1marks, Causative organism – 1 marks, Symptom-2 Control measure – 2 marks, diagram –2marks)
G- Plant protection appliances – 2 marks
PERIYAR UNIVERSITY, SALEM – 636011
B.Sc., BOTANY

PU- B.Sc., Botany (College), 2021-22

MODEL QUESTION PAPER
(For Students Admitted from the Academic Year 2021 – 2022 onwards under CBCS Pattern)

B.Sc., BOTANY ALLIED PRACTICAL
SUBJECTCODE: 21UBOAP01

Time : 3 hrs.  
Maximum: 60 Marks  
Practical : 50 Marks  
Record : 10 Marks

1. Refer A&B to their families giving reasons (Diagrams not necessary) 10 Mark
2. Identify the plant, family and morphology of the parts used for C, D, E, F and G. 15 Mark
3. Cut transverse section of H & I. Stain and mount in Glycerin. Identify giving reasons. Draw diagrams. Submit the slides for valuation. 10 mark
4. Write critical notes on J, K, L, M, N, O. Draw diagrams. 12 mark
5. Physiology Experiment P 3 mark

KEY

1. For A and B - Any 2 plants prescribed in the syllabus.  
   Reasons 3, Identification -2  
   2 x 5 = 10 mark
2. For C, D, E, F and G - any 5 specimens given in the practical syllabus.  
   5X3=15 Mark
4. For H and I – Slide -2 Identification -1 Reasons – 2  
   2 x 5 = 10 mark
4. Notes 1, Diagram 1 for J, K, L, M, N, O  
   2 x 6 = 12 mark
5. Physiology Experiment P 3 Mark