RAJAH SERFOJI GOVT.COLLEGE (AUTONOMOUS)

THANJAVUR – 05

Department of Botany

ELECTIVE BOTANY SYLLABUS

(For Candidates admitted from 2023 -2024 onwards)

RAJAH SERFOJI GOVT. COLLEGE (AUTONOMOUS)

THANJAVUR —05

Department of Botany

Board of Studies Meeting

The Board of studies meeting in Botany was held on 24.07.2023 at 10.00 am in the Department of Botany under the Chairmanship of Dr. M. JAWAHAR.

The following members were present in the meeting.

External members:

1. **Dr. T.Senthil Kumar**
2. **Dr. G.Dhandapani**
3. **Dr.K.Vasanth**

As per the recommendation of TANSCHE, the syllabi for Elective Botany Papers, I, II and III (Practical). Under CBCS system were discussed, finalized and approved. The syllabi are appended herewith.

RAJAH SERFOJI GOVT. COLLEGE (AUTONOMOUS)

THANJAVUR —05

Department of Botany: Board of studies meeting

Board of studies members:

UNIVERSITY NOMINEE : **Dr.T.SENTHIL KUMAR**
Professor in Botany,
Bharathidasan University,
Trichy – 24.

DEPARTMENT NOMINEE : 1. **Dr.G.DHANDAPANI**,
Assistant Professor in Botany,
Kongunadu Arts & Science College, Coimbatore

2. **Dr.K.VASANTH**
Associate Professor in Botany,
Bharathiyar University,
Coimbatore – 23.

CHAIRMAN : **Dr.M.JAWAHAR**,
Assistant Professor & Head,
Department of Botany,
Rajah Serfoji Govt. College (A),
Thanjavur-05

RAJAH SERFOJI GOVT.COLLEGE (AUTONOMOUS)

THANJAVUR – 5

n(For Candidates admitted from 2023 -2024 onwards)

DEPARTMENT OF BOTANY

ELECTIVE BOTANY

(For B.Sc., Zoology and Biochemistry Major Students)

Paper Sl.No	Semester	Subject Code	Title of the paper	Hours / Week	Credits
I	III		Botany Paper – I	3	2

OBJECTIVES:

- To develop an aptitude towards plant diversity.
- To study the general characters, structure and lifecycle of algae, fungi, bryophytes, pteridophytes and gymnosperms.
- To study the economic importance.
- To study morphology and types of leaf and inflorescence.
- To study systems of classifications and general outline of Bentham and Hooker's classification.

Unit: 1 Thallophytes: Algae–General characters of Algae, structure, reproduction and life cycle of the following genera, anabaena and sargassum. Economic importance of Alage.

Unit: 2 Fungi and Virus:

Fungi: General characters of fungi, structure, reproduction and life cycle of the following genera, *Albugo*, Yeast, and *Polyporus*, Economic importance of Fungi.

Virus: General characters, Structure of TMV and bacteriophage.

Unit: 3 Bryophytes, Pteridophytes and Gymnosperms: General characters, Anatomical features and life cycle of *Funaria,Adiantum* and *Cycas*.

Unit: 4 **Morphology of flowering plants:** Plants and its parts – leaf types and morphology. Inflorescence types -Racemose, Cymose, and Mixed–Special types, Cyathium, Hypanthodium, Verticillaster and Thyrsus. Technical description of flower and floral diagram.

Unit: 5 **Taxonomy:** Systems of classification, General outline of Bentham and Hooker's classification. Detailed **s**tudy and economic importance of the families: *Annonanceae, Rutaceae*, *Leguminosae*, C*ucurbitaceae,Apocynaceae*, *Lamiaceae* and *Poaceae.*

Reference:

1. Rao, K.N. and Krishnamurthy, K.V. 1979. Ancillary Botany.S. Viswanathan& Co. Chennai.
2. Nathawat, G.S., Sharma., P.D and Shani R.K. 1977. A Text Book of Botany. Ramesh Book Depot. Jaipur.
3. Fullar, H.J., and Tippo.O. 1949. College Botany. Hendry. Holt & co.
4. Rajaram, P. Allied Botany 1983. College Book Publisher. Chennai.
5. Jeyaram, P. Allied Botany 1983. Veekay Publishing house. Chennai.
6. Muneeswaran.A. Allied Botany Srinivas Book Center. Thanjavur.
7. Narayanaswamy.R.V.,Rao.K.N. and Raman. A. 1992. Out lines of Botany.S. Viswanathan Printers and Publisher Pvt Ltd., Chennai.

Question Paper Pattern

Maximum Marks: 75 Duration:3hrs

- **Part A 10 X 2 = 20 Answer All questions**

  (Two questions from each unit)

- **Part B 5 X 5 = 25 Answer All questions**

  (Either or type -Two questions from each unit)

- **Part C 3 X10= 30 Answer Any THREE questions**

  (One question from each unit)

Course outcomes:

On completion of the course, students are able to

- Understand the biodiversity of thalophytes.
- Know the systematic,morphology,structure,lifecycle pattern and economic importance of algae and fungi.
- Know the concept of taxonomy and systematic position, salient features and reproduction of bryophytes, pteridophytes and gymnosperms.
- Understand the plant morphology and technical terms of floral parts of angiosperms.
- Know the concept of taxonomy and systematic position of angiosperms.
- Understand salient features and economic importance of angiosperms.

Paper Sl.No	Semester	Subject Code	Title of the paper	Hours / Week	Credits
II	IV		Botany Paper – II	3	2

OBJECTIVES:

- To study dicot and monocot plant anatomy and their difference.
- To study plant cell structure and cell organelles.
- To study flowering plant reproduction, fertilization and embryogeny.
- To study general classification and ecological adaptations of plants.
- To study photosynthesis and respiration of plant.
- To study basic principle of plant tissue culture techniques.

Unit: 1 Anatomy and Cell Biology:

Anatomy: Primary structure – Dicot stem, root and leaf – Monocot stem, root and leaf – secondary thickening in Dicot stem. Heart wood and sap wood.

CellBiology : Prokaryotic and eukaryotic cell – Structure /organization. Ultra structure of plant cell, Brief outline of cell organelles –Golgi complex, Mitochondria, Chloroplast and Nucleus.

Unit: 2 Embryology and Genetics:

Embryology: Structure and development of anther - male gametophyte development. Structure of ovule and development of female gametophyte (Polygonum type). Endosperm (Nuclear, Cellular, Helobial and Ruminate). Double fertilization, development of Dicot embryo (*Capsella*).

Genetics: Laws of Mendel (law of units of characters, law of dominance, law of segregation, law of independent assortment) monohybrid and dihybrid cross. Test cross and back cross.

Unit: 3 Plant Ecology and Evolution:

Plant Ecology: Ecological factors**,** General Classification and adaptations of Hydrophytes (Hydrilla), Adaptations of Xerophytes (Nerium, Opuntia) and mesophytes (Helianthus).

Evolution: Origin of life, theories of Lamarckism and Darwinism.

Unit: 4 Plant Physiology :

Transpiration and factors affecting it, guttation. Growth hormones Auxins and Cytokinins and its applications.

Photosynthesis: Light and Dark reaction.

Respiration: Aerobic–Glycolysis and Krebs cycle, Anaerobic - Fermentation.

Movement: Geotropism, phototropism, Thigmotropism and Hydrotropism (Definition and examples only).

Unit: 5 Plant Biotechnology: Tissue culture - Sterilization, Murashige and Skoog's medium. *In vitro* culture methods (Micro propagation, Organogenesis, Somatic embryogenesis). Applications of plant Tissue culture.

Reference:

1. Rao, K.N. and Krishnamurthy, K.V. 1979. Ancillary Botany S.Viswanathan& Co, Chennai.
2. Nathawat, G.S. Sharma., P.D and Shani R.K. 1977. A text book of botany. Ramesh Book. Jaipur
3. Fullar, H.J and Tippo.O. 1949. College Botany. Henry, Holt & Co.
4. Rajaram, P. Allied Botany 1983. College Book Publisher. Chennai.
5. Jeyaram, P. Allied Botany 1983. Veekay Publishing house. Chennai.
6. Muneeswaran.A. Allied Botany. Srinivas Book Publisher. Thanjavur.
7. Narayanaswamy.R.V.Rao.K.N. and Raman.A. 1992. Out lines of Botany.S. Viswanathan printers and publisher Pvt Ltd., Chennai.
8. Singh, Pande, and Jain, 1987, Anatomy of seed plants Rastogi publications.
9. Verma, P.S and Agarwal, V.K 1991.Cytology. S.Chand & co. New Delhi – 55
10. Kumaresan.V.Biotechnology. Saras Publications, Nagarcoil. 11. Dubey.R.CA text book of biotechnology.S. Chand & co. 12.Palaniyappan.S. Biotechnology (Tamil).

Question Paper Pattern

Maximum Marks: 75 Duration: 3hrs

- **Part A 10 X 2 = 20 Answer All questions**
  (Two questions from each unit)
- **Part B 5 X 5 = 25 Answer All questions**
  (Either or type -Two questions from each unit)
- **Part C 3 X10= 30 Answer Any THREE questions**
  (One question from each unit)

Course outcomes:

On completion of the course, students are able to

- Understand the scope and importance of plant anatomy and normal secondary growth in plants.
- Gain knowledge about cell and cell organelles.
- Know the concept of Mendel's law and experiments.
- Gain knowledge about the sex organs development, fertilization and embryogeny of flowering plat.
- Understand the ecology, plant communities and ecological adaptations of plant.
- Know the concept of evolution, origin of life and their theories.
- Understand the principle and basic protocols for plant tissue culture

Paper Sl.No	Semester	Subject Code	Title of the paper	Hours / Week	Credits
III	IV		Botany Paper-III Practical	3	2

OBJECTIVES:

- ❖ To study the identification of flowering plants.
- ❖ To study micro preparation of thalophytes, bryophytes, pteriodophytes, gymnosperms and flowering plant.
- ❖ To study plant field collection.
- ❖ To study herbarium techniques.
- ❖ To study basic plant tissue culture technique.

One allied practical paper for subjects included in paper - I and paper - II. In practical candidates are expected to carry out the following exercise.

a). To describe the Technical terms of the plants with respective to syllabi.
b). To make dissection of the flower and construct floral diagrams
c) To study monocot, dicot and ecology plant anatomy in the theory syllabus.
d) Sterilization techniques – demonstration only
e) Plant physiology – Demonstration of experimental set-ups
f) Field visit and plant collection, submission of five herbarium specimens.
g) To submit a record of work done by the candidate during the course of study in practical classes, duly certified and bonafied.

Reference:

1. Rao, K.N. and Krishnamurthy, K.V. 1979. Ancillary Botany Viswanathan & Co. Chennai.
2. Nathawat, G.S., Sharma., P.D and Shani R.K. 1977. A text Book of Botany. Ramesh Book Depot. Jaipur.
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8. Sing, Pande, and Jain, 1987, Anatomy of seed plants. Rastogi publications, Meerut.
9. Verma, P.S. and Agarwal., V.K. 1991. Cytology.S. Chand & co. Ram Nagar, New Delhi.
10. Kumaresan. Biotechnology Saras Publications, Nagarcoil .

Course outcomes:

On completion of the course, students are able to

- ❖ Students learn to carry out practical work in the field and in the laboratory with minimal risk.
- ❖ Gain introductory experience in applying each of the following skills.
- ❖ Gain knowledge about plant diversity.
- ❖ Gain knowledge about the identification of flowering plant and plant Morphology.
- ❖ Gain knowledge about ecology, ecological adaptations.
- ❖ Gain knowledge about the micro preparations.
- ❖ Gain knowledge about the photosynthesis and respiration.
- ❖ Gain knowledge about the experiment of transpiration, photosynthesis and respiration.
- ❖ Gain knowledge about the plant tissue culture technique.
- ❖ Gain knowledge about the preparation of herbarium.