MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI - 12
UG COURSES-AFFILIATED COLLEGES
B.Sc. BOTANY
(CHOICE BASED CREDIT SYSTEM)
(With effect from the academic year 2020-2021 onwards)

Course Structure for B.Sc Botany Major (with effect from the academic year 2020 to 2021 onwards)							
Sem.	**Part**	**Sub. No.**	**Subject Status**	**Subject Title**	**Course Paper**	**Hrs./ Week**	**Credits**
I	I	1	Language	Tamil / Other Languages	1	6	4
	II	2	Language	Communicative English	1	6	4
	III	3	Core I	Algae and Bryophytes	1	4	4
	III	4	Major Practical I	Algae and Bryophytes - Practical	1	2	2
	III	5	Add on Major (Mandatory)	Professional English for Life Sciences - I	1	4	4
	III	6	Allied I	Plant Diversity and Medicinal Botany	1	4	3
	III	7	Allied Practical I	Plant Diversity and Medicinal Botany - Practical	1	2	2
	IV	8	Common	Environmental Studies	1	2	2
				Sub Total	**8**	**30**	**25**
II	I	9	Language	Tamil / Other Languages	1	6	4
	II	10	Language	English	1	6	4
	III	11	Core III	Plant Anatomy and MicroTechniques	1	4	4
	III	12	Major Practical II	Plant Anatomy and MicroTechniques - Practical	1	2	2
	III	13	Add on Major (Mandatory)	Professional English for Life Sciences II	1	4	4
	III	14	Allied II	Embryology, Plant Anatomy, Physiology and Biotechnology	1	4	3
	III	15	Allied Practical II	Embryology, Plant Anatomy, Physiology and Biotechnology - Practical	1	2	2
	IV	16	Common	Value Based Education / சமூகஒழுக்கங்களும் பண்பாட்டு விழுமியங்களும் / Social Harmony	1	2	2
				Sub Total	**8**	**30**	**25**

COURSE OBJECTIVES

- To introduce the students of Botany to current trends and practices in Biology of plants.
- To restructure syllabus in a job oriented manner.
- To prepare the students of Botany of this university well equipped to meet the demands of various competitive examinations.
- To inculcate the temperament of research in the students of UG course of this branch.

ELIGIBILITY FOR ADMISSION

Those who have passed Higher Secondary Examination with Biology/ Botany as one subject in Part III are eligible for admission to B.Sc., BOTANY COURSE.

Question paper will consist of (both major and allied)

Part-A: 1-10 Questions (objective type from each unit)	(10x1=10 marks)
Part-B: 11-15 Questions (Internal choice from each unit)	(5x5=25 marks)
Part-C: 16-20 Questions (Internal choice from each unit)	(5x8=40 marks)

MSU/ 2020-2021/ UG-Colleges/Part-Ill (B.Sc.Botany) /Semester - I/ Core - I

ALGAE AND BRYOPHYTES

(4 hrs/week)

UNIT-I **12Hrs**

General characters and classification of Algae based on Fritsch (1945), life cycle patterns of Algae, systematic position, distribution, structure, reproduction and life history of *Volvox* and *Caulerpa* .

UNIT-II **12Hrs**

Systematic position, distribution, structure, reproduction and life history *of Chara, Sargassum* and *Gracilaria.*

UNIT-III **12Hrs**

Seaweed cultivation – *Gracilaria;* Methods of extraction and uses of agar-agar and carrageenin; Economic importance of Algae.

UNIT -IV **12Hrs**

Morphology, mass culture and nutritive importance of *Spirulina;* Morphology, mass culture and economic importance of *Nostoc.*

UN1T-V **12Hrs**

General characters and classification of Bryophytes by Rothmaler (1951); systematic position, distribution, structure, reproduction and life history of *Marchantia.*

REFERENCES:

1	Dubey R.C.	1993	A text book of bio-technology S.Chand & comp.Ltd., New Delhi.
2	Fritsch F.E.	1972	The structure and reproduction of Algae Vol. I & II
3	Kamat N.D	1982	Topics in algae, Sai Kraipa Prakashan Aurangabad.
4	KumarH.D& Singh H.N	1982	A Text book of Algae East West Press pvt. Ltd New Delhi.
5	Pandey S.N &TrivediP.S	1977	Text book of Botany Vol I - Vikas publishing house j Pvt. Ltd., New Delhi.
6	Parihar N.S	1967	Bryophyta-Central Book Depot Publications in Botany, Allahabad.
7	Sharma O.P	1986	Text Book of Algae. Tata Me Graw- Hill Publications. New Delhi,
8	VashistaB.R	1997	The Algae, S. Chand & Co, New Delhi.
9	Venkatraman	1969	The cultivation of Algae-Indian council of Agricultural Research - New Delhi.
10	Watson E.V	1974	Structure and life cycle of Bryophytes- B.I. Publications New Delhi.

MSU/ 2020-2021/ UG-Colleges/Part-Ill (B.Sc.Botany) /Semester - I/ Major Practical-I

ALGAE AND BRYOPHYTES - PRACTICAL

1. Study of Morphology of the Algae and Bryophytes prescribed in the syllabus.
2. Make suitable micro preparations of the following:
    a. *Caulerpa* - Rhizome b. *Sargassum* - Stipe, leaf
    c. Gracilaria - Thallus with cystocarp d. *Marchantia* - Thallus.
3. Observe and identify the microslides
    a. *Volvox* - Vegetative colony, colony with daughter colonies and sex organs.
    b. *Chara* - Sex organs
    c. *Sargassum* - Male and female conccptacles
    d. *Gracilaria* - Thallus with cystocarp.
    e. *Marchantia* -- V.S of Gemma cup, V.S of Antheridiophore,
    f. V.S of Archcgoniophore, V.S of Sporophyte
    g. Algal Slides/Tablet - *Spirulina, Nostoc;* BGA-fertilizer (packet);
4. Field trip of minimum one day.

MSU/ 2020-2021/ UG-Colleges/Part-Ill(B.Sc.Botany) /Semester – I /Allied – I

Semester 1 / III

PLANT DIVERSITY AND MEDICINAL BOTANY

4hrs/week

UNIT -1

General characters and economic importance of Algae - Distribution, Structure and Life History of Volvox; General characters and economic importance of Fungi - Distribution, Structure and Life History of Polyporus.

UNIT-II

General characters and classification of Lichens; Structure and Reproduction of Usnea. General characters of Bryophytes; Structure, Reproduction and Life History of Funaria.

UNIT - III

General characters of Pteridophytes; Structure, Reproduction and Life History of Lycopodium. General characteristics of Gymnosperms; Structure, Reproduction and Life History of Pinus,

UNIT-IV

Bentham and Hooker's system of classification; Critical study of the following families: Rutaceae, Asclepiadaceae, Euphorbiaceae and Poaceae.

UNIT - V

Study of the following plants with reference to the morphology of the useful parts and their medicinal importance: *Aloe vera, Piper nigrum, Phvllanthus amarus, Coleus amboinicus* and *Catharanthus roseus,*.

REFERENCES:

1. Chapman, V.J & Chapman, D.J.Elbs and Macmillian 1960 The Algae ,
2. Chamberlain C.J. 1986 Gymnosperm, structure and Evolution CBS Publishers and Distributors, Delhi
3. Chopra, R.N. and Kumar, P.K. 1988 Biology of Bryophytes, Wiley Eastern Ltd., New Delhi
4. Kokate, C.F. Purohit, A.P . and Gohale, S.R. 2004 Pharmacognosy, NiraliPrakashan, New Delhi
5. Pandey, B.P. 1997 Taxonomy of Angiosperms, S.Chand and company Ltd., New Delhi
6. Rashid, A. 1976 An Introduction toPteriodophytes, Vikas Publishing House, New Delhi
7. Vashista, B.R 1990 .Botany for Degree Students, Fungi S.Chand and Co., Ltd., New Delhi

PLANT DIVERSITY AND MEDICINAL BOTANY - PRACTICAL

1. Assign the given plant to its family, giving reasons.
2. Dissect out and draw the floral parts of the plants belong to the families prescribed in the syllabus.
3. Make suitable micropreparations of Lycopodium stem, Pinus needle.
4. Identify and record the medicinal values and morphology of the useful parts of the plants prescribed in the syllabus.
5. Observe and identify the following specimens: Polyporus, Funaria, Lycopodium and Pinus -male and female cone.
6. Identify the slides showing mature anther, ovule, dicot embryo, Volvox. Nostoc, Yeast, Lycopodium - cone L.S and Funaria -capsule L.S.

MSU/ 2020-2021 UG-Colleges /Part-Ill (B.Sc.Botany) / Semester-II/ Core –II

PLANT ANATOMY AND MICRO TECHNIQUES
(4 hrs/wcek)

UNIT-I **12Hrs**

Meristems - Characteristics of meristematic tissues - Types, functions and Theories of meristems. Structure and functions of simple and permanent tissues - parenchyma, collenchyma, sclerenchyma, xylem and phloem.

UNIT-II **12Hrs**

Structure of dicot stem and root, structure of monocot stem and root, structure of dicot and monocot leaves.

UNIT-III **12Hrs**

Normal secondary thickening in dicot stem and root, anomalous secondary growth in the stem of *Boerhaavia* and *Dracaena.*

UNIT-IV **12Hrs**

Nodal anatomy: Types of nodes – unilocular, trilocular and multilocular; leaf traces and leaf gaps; epidermal tissue system: stomatal types, hair, trichomes and glands.

UNIT-V **12Hrs**

Microscopy: Principle and working of simple and compound light microscopes and electron microscope (TEM only). Micro techniques - simple staining, double staining and preparation of permanent slides – Maceration

REFERENCES :

1. Cutter, 1978 - Plant Anatomy, Edward Arnold publishers, London,
2. Eames, A.J 1991-Morphofogy of Angiosperms. Mc Graw Hill Pub.,New Delhi.
3. Esau,K.1953-PlantAnatomy,Wileypub.co.Newyork.
4. Fahn, A. 1987- Plant Anatomy ,Maxwell House New York.
5. Johensen,D.A 1940 -Plant Microtechnique. Mc Graw Hill Book Company Inc. New york.
6. Pandey B.P 1982-Plant Anatomy -S. Chand & company Ltd., New Delhi.
7. Vashista, B.R 1997 -The plant Anatomy R. Chand & co. New Delhi.

MSU/ 2020-2021 UG-Colleges /Part-Ill (B.Sc.Botany) / Semester-II/ Major Practical - II

PLANT ANATOMY AND MICRO TECHNIQUES - PRACTICAL

1. To observe and identify the following slides showing
    a. Meristems - shoot apex and root apex
    b. Simple tissues
    c. Xylem elements
2. Primary structure of stem, root and leaves of dicot and monocot plant.
3. Normal secondary thickening in dicot stem and root.
4. Anomalous secondary growth in *Boerhaavia* and *Dracaena.*
5. Maceration technique (Xylem elements only)
6. Demonstration: Preparation of double stained permanent slides.

MSU/ 2020-2021 UG-Colleges /Part-Ill (B.Sc. Botany) / Semester-II / Allied –II

Semester II/IV

EMBRYOLOGY, PLANT ANATOMY, PHYSIOLOGY AND BIOTECHNOLOGY
4hrs/week

UNIT -1

Structure and development of microsporangium; Structure, types and development of megasporangium; Development of male and female gametophyte; Double fertilization, Endosperm - types. Structure of dicot embryo.

UNIT -11

Meristem - Structure and classification. Simple tissues, complex tissues; Primary structure of Dicot and Monocot stem and root; Structure of leaf; Normal secondary thickening in dicot stem.

UNIT - III

Absorption of water - diffusion, osmosis, imbibition, mechanism of absorption of water; Ascent of sap - (cohesion theory only); Transpiration - Types, Mechanism of stomatal transpiration (Starch - sugar hypothesis); Photosynthesis - importance of photosynthesis, Mechanism of Photosynthesis - Light and dark reaction (Calvin cycle).

UNIT - IV

Nostoc - Morphology, Use as Biofertilizer and Mass cultivation; Structure, multiplication (budding and fission) and Mass culture of Yeast.

UNIT - V

Tissue Culture - Scope and importance - totipotency. Nutrient media (M.S medium) Callus and Meristem Culture; Applications of plant tissue culture.

REFERENCES:

1. Bojwani, S.S and Bhatnagar,S.P. 1987 The Embryology of Angiosperms, VikasPublications, New Delhi
2. Dubey, R.C. 2002 A text Book of Biotechnology, S.Chand and Co; New Delhi
3. Jain, V.K. 2001 Fundamentals of Plant Physiology , S.Chand and Co; New Delhi
4. Pandey, B.P. 2002 Plant Anatomy, S.Chand and Co; Ram Nagar, New Delhi
5. Pandey, K.K. Sinha, B.K. 1988 Plant Physiology, Vikas Publications, New Delhi

MSU/ 2020-2021 UG-Colleges/Part-Ill (B.Sc,Botany)/ Semester - II/

Allied Practical-II

PRACTICAL – II

EMBRYOLOGY, PLANT ANATOMY, PHYSIOLOGY AND BIOTECHNOLOGY-PRACTICAL

1. Dissect out young embryo from *Tridax* flower bud.
2. Make suitable micro-preparations of dicot and monocot stem, root and leaf.
3. Demonstrate the physiology experimental set up - Potato osmoscope, Ganong's light screen, Bell jar experiment.
4. Identify the Photograph/Slide/Specimen/setup -(i) *Nostoc* (ii) Yeast (iii) Callus culture, (iv) Meristem culture.
5. Maintain a record note book for external and internal evaluation.