

PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGARSALEM - 636011

DEGREE OF BACHELOR OF SCIENCE

CHOICE BASED CREDIT SYSTEM

Syllabus for

B.SC. 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.

Part I -			Refers Foundation "Tamil/other languages" offered under the programme.					
Part II -			Refers Foundation "Communicative English" offered under the programme.					
Part III -			Refers "the core subjects" related to the programme concerned including Practicals.					
Part III Allied -			Refers "Allied subjects" offered as allied, which is interdisciplinary in nature but related to the programme.					
Part III Electives		-	Includes "Core/Elective subjects" related to the core subjects of the programme concerned.					
Part IV	(i)	-	"Non-Major Electives" means option is being given to students who donot come under the above two categories (i & ii).					
	(ii)	-	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.					
	(iv)	-	"Foundation Course" means courses offered as					
			1) Environmental Studies (1 st year)					
			2) Value Education - Yoga (1st year)					
			3) Professional English for Life science					
Part V		_	 Nan mudhalvan course like office fundamentals and medical coding to enhance employability 					
			"Extension Activities" means all those activities which					
			form part of NSS/NCC/Sports/YRC and other co and					
			extracumentar activities.					

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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 Boardof 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 appliedbranches.
- 3. Skill based subjects in botany like Mushroom Technology, Horticulture, Agriculture Microbiology, Plant Breeding and Plant utilization as food and Seed Technology; and papers like Efficient English, Office Fundamentals and Medical coding have been included in order to provide opportunities in employment and research in Government and Private Organizations.
- 4. Some of the above courses also provides foundation for enterprenership.
- 5. Practicals included in the syllabus will improve the skills of the students in Microscopic techniques, Observations, Drawing and Physiological and Ecological Laboratorytechniques.

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.

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DURATION OF THE COURSE:

The course for the degree of Bachelor of Science shall consist of three academic years divided in to 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:

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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.

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Course Structure (CBCS)

B.Sc BOTANY COURSE STRUCTURE FROM THE YEAR 2021-2022 ONWARDS

Sem	Part	Course	Int Hrs	Credit	Exam Hrs		Marks	
						CI A	EA	Total
	Ι	Language paper I	6	3	3	25	75	100
	Π	Communicative English paper I	6	3	3	25	75	100
	II	Professional English I	2	4	3	25	75	100
	III	Core Course I	4	5	3	25	75	100
т		(Plant Diversity I)						
1	III	Core Course II	3	(Practical	Assessment	and credit c	arried to	
		(Major Practical I)		II sem	Core Course	II)		
	III	First Allied –I Zoology/Chemistry	4	3	3	25	75	100
	III	First Allied –I Practical	3	l	Practical Asse	essment and	l credit carr	ied to
		Zoology/Chemistry			II sei	m Allied C	Course II	
	IV	Environmental Studies	1					
	IV	Value Education	1	2	3	25	75	100
		TOTAL	30	20				600
II	Ι	Language paper II	6	3	3	25	75	100
·	Π	Communicative English paper II	4	3	3	25	75	100
·	II	Professional English II	2	2	3	25	75	100
	II	Nan Mudhalvan- Effective English	2	2	3	25	75	100
	III	Core Course III	4	3	3	25	75	100
		(Plant Diversity II)						
	III	Core course II	3	3	3	40	60	100
		(Major Practical I)						
	III	First Allied -II Zoology/Chemistry	4	4	3	25	75	100
	III	First allied –I Zoology/Chemistry	3	3	3	40	60	100
		(Practical)						
·	IV	Environmental Studies	1	2	3	25	75	100
	IV	SBEC I Mushroom Technology	1	2	3	25	75	100
			30	27				1000
	Ι	Language paper III	6	3	3	25	75	100
	Π	Communicative English -III	6	3	3	25	75	100
	IIII	Core course –IV	4	4	3	25	75	100
		(Plant Diversity III)						
	III	Core course V	3	(Practical Ass	essment an	d credit car	ried to
		(Major Practical II)			IV Se	em Core C	ourse V)	
	III	Second Allied –I Zoology/ Chemistry	4	4	3	25	75	100
	III	Second Allied practical I	3	(Practical Asso	essment and	d credit carr	ied to
		Zoology/Chemistry			IV Set	m Second	allied II)	
III							r	
	IV	Employability Skills-Microsoft	2	2	3	25	75	100
	IV	NMEC-I (Mushroom Culture)	2	2	3	25	75	100
			30	18				600
IV	Ι	Language paper IV	6	3	3	25	75	100
	Π	Communicative English -IV	6	3	3	25	75	100

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	III	Core course –VI	4	4	3	25	75	100
		(Anatomy & Embryology of						
		Angiosperms)						
	III	Core course V	3	3	3	40	60	100
		(Major Practical II)						
	III	Second Allied –II Zoology/Chemistry	4	4	3	25	75	100
	III	Second Allied Practical I	3	3	3	40	60	100
		Zoology/Chemistry						
	IV	Nan Mudhalyan-	2	2	3	25	75	100
	1 V	Employability Skills- Microsoft	2	2	5	25	15	100
	11/	NMEC II Harbel Betany	2	2	2	25	75	100
	1V	NMEC-II Herbai Botany	2	Z	3	25	/5	100
		and Ornamental Gardening, Organic Farming, Waste Recycling and Vermicomposting, Mushroom Production, Nursery Techniques of Horticultural Plants, Preservation of Fruits and Vegetables, on line internship etc						
		TOTAL	30	24				800
V	III	Core course VII (Morphology	5	5	3	25	75	100
	ш	&Taxonomy of Angiosperms)	5	5		25	75	100
	ш	Core course VIII (Cell Biology)	5	5	3	25	75	100
	ш	Breeding)	5	5	5	23	75	100
	III	Core course X (Major Practical III) (Core courseVII, VII& IX)	3	(Pract	tical Assessme Co	ent and cred	lit carried to X)	VI Sem
	III	Core course XI (Major Practical IV)	3	(Prac	tical Assessme	ent and cred	lit carried to	VI Sem
		(Core courseX, XI & XII)			Co	re Course 3	XI)	
	III	Major Elective course I (Plant and Environmental Biotechnology)	3	3	3	25	75	100
	IV	SBEC-IV – (Agricultural Microbiology)	2	2	3	25	75	100
	IV	SBEC-V-(Biological Techniques and Computer Application)	2	2	3	25	75	100
	IV	Advanced Technology for Employability in Life Science – International Regulatory Requirements in Clinical Trial and Data Management	2	2	3	25	75	100
		Evaluation of Internship	0	0	viva			comment
		TOTAL	30	24				600
VI	III	Core course XII (Plant Physiology)	5	5	3	25	75	100
	III	Core course XIII (Plant Ecology and Plant Geography	5	5	3	25	75	100
	III	Core course XIV (Plant Protection)	5	5	3	25	75	100
	III	Core course X (Major Practical III) (Core courseVII, VII & IX)	3	4	4	40	60	100
	III	Core course XI (Major Practical IV) (Core courseX, XI & XII)	3	4	4	40	60	100
	III	Major elective course (Biochemistry)	5	5	3	25	75	100
	III	NMSDC-Food and Agrii Business management skill for Employability- Organic Food Production Techniques	2	2	3	25	75	100
	IV	SBCE VII- Seed Technology	2	2	3	25	75	100

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	IV	Extension Activities	1				
		TOTAL	30	32			800
		GRAND TOTAL		142			4200

B.Sc., BOTANY

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

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

ALGAE

UNIT I

General characteristics of algae. Evolutionary trends in algae. Classification (F.E.Fritsch) of algae.

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

15 hrs

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: Xanthophyeae: Vaucheria Bacillariphyceae: 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*.

3. Study the Economic importance of Algae (Spotter-Agar-Agar, Carrageenan, SCP (*Spirulina*) - *Chlorellin*, Gelling agent (*Ulva*), Fodder (*Sargassum*) - Diatomite.

ALGAE

Text Books

Annie R, Kumaresan V & Arumugam N (2014). Algae and Bryophytes. Saras Publication; I Edition, Nagercoil, Tamilnadu.

Kumar, HD (1999). Introductory Phycology. 2ndedition. Affiliated East-West Press Pvt. Ltd. Delhi.

Pandey, BP (1994). Algae. S. Chand & Company Ltd. New Delhi.

Sharma, OP (2011). Algae. Tata McGraw Hill Education Private Ltd. New Delhi.

Vashishta, BR, Sinha AK, and Singh, VP (2011). Botany for Degree Students-Algae. S. Chand Pub. New Delhi

References

Bold, HC &Wynne, MJ (1985). Introduction to the Algae. Prentice Hall of India. New Delhi.

Chapman, VJ & Chapman DJ. The Algae. Macmillan Publication. New York.

Fritsch, FE (1945). Structure and reproduction of Algae. Cambridge University press. Cambridge, UK.

Lee, RD (2008). Phycology 4th Edition, Cambridge University Press, New York.

Round, FE (1984). The Ecology of Algae. Cambridge University Press.

BRYOPHYTES

Text Books

Parihar, NS (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

Sharma, OP (2013). Bryophytes. McGraw Hill education (India) Pvt. Ltd. New Delhi. Vashishta, PC (1999). Bryophyta. S. Chand & Company, New Delhi.

Vashishta, & Sinha AK (2011). Bryophytes. S. Chand & Company Ltd. New Delhi.

References

Cavers, F (1971). The interrelationship of Bryophyta. Dawsons of Pall Mall, London

PremPuri (1981). Bryophytes: Morphology, Growth and differentiation. Atma Ram and Sons, New Delhi.

Rashid, A (1998). An Introduction to Bryophyta. Vikas Pub. Ltd. New Delhi.

Smith, AJE (1982). Bryophyta: Ecology. Chapman and Hall. London. Watson, EV (1968). British Mosses and Liverworts. Hutchinson and Co., London. Watson, EV (1970). Structure and life of Bryophytes. Hutchinson and Co., London.

PU- B.Sc., Botany (College), 2021-22/ 5 Credit /4hrs/Week/60hrs/II SEM SEMESTER –II CORE COURSE –III SUBJECT CODE: 21UBO02 PLANT DIVERSITY –II (FUNGI, LICHENS, BACTREIA AND VIRUSES)

FUNGI

UNITI

A study of the general characteristics and mode of life of fungi: Vegetative organization, nutrition, asexual reproduction, sexual reproduction,

Heterothallism and Parasexuality. Life cycles in Fungi-Haplontic, Diplontic and haplodiplontic. Classification of fungi (C.J. Alexopoulos and Mims, 1979). Economic importance of Fungi.

UNIT II

12hrs

12 hrs

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

12 hrs

12 hrs

12 hrs

Detailed study of Occurrence, Morphology, Reproduction, Life cycle and Economic importance of the following genera:

Teliomycetes: Puccinia, Hymenomycertes; Polyporus and Deuteromycetes: Cercospora

LICHENS AND VIRUSES

UNIT IV

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

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 Bacteriausing permanent slides / photographs.

5. Economic importance of fungi: Yeast, antibiotic- Penicillin, Wood rotting- *Polyporus*, edible fungi: *Agaricus*.

6. Economic importance of bacteria: Lactobacillus

Fungi

Text Books

Alexopoulus, CJ & Mims, CW (1979). Introductory Mycology. Wiley Eastern ltd., New Delhi.

Dube, HC (1990). An Introduction of Fungi. Vikas Publication House Ltd. New Delhi.

Dube, HC (1983). Introduction of Modern Mycology. Blackwell Science Pb. Oxford.

Sharma, OP (2011). Fungi and allied microbes. The McGraw –Hill, New Delhi.

Sharma, PD (2003). The Fungi. Rastogi Publications, Meerut.

References

Burnett, J.H. (1971). The fundamentals of Mycology. ELBS Publication, London

- Bessey, E.A (1979). Morphology and Taxonomy of fungi. Vikas publishing House Pvt. Ltd. New Delhi.
- Mehrotra, RS & Aneja, KR (1990). An Introduction to Mycology. New Age International Pub. New Delhi.
- Sundararajan, S (2004). Practical manual of fungi. Anmol Publications Pvt. Ltd New Delhi.

Webster, J (1970). Introduction to fungi. Cambridge University Press. London.

LICHENS

References

Dharani Dhar Awasthi (2000). A Handbook of Lichens. Vedams eBooks (P) Ltd. New Delhi.

Hale, ME. (1983). The Biology of Lichens. Edward Arnold, London.

Muthukumar, S & Tarar, JL (2006). Lichen Flora of Central India. Eastern book Corporation. New Delhi.

Nash, TH (1996). Lichen Biology. Cambridge University Press, London.

BACTERIA

Text Books

Pelzer, MJ, Chan, ECS and Krieg, NR .(1983). Microbiology. Tata MaGraw Hill

Publishing House, New Delhi

Powar and Dagainwala. (1994). General Microbiology. Himalayan publishing House, New Delhi

Sharma, PD (1992). Microbiology. Rastogi & Co., Meerut

Tauro, P, Kapoor, KK & Yadav, KS (1996). An Introduction to Microbiology. New age International Pvt. Ltd. Pub. New Delhi.

References

Stainer ,RY, Adelberg, EA & Ingram, JL (1978). General Microbiology. Mac Millan & Company. London .

VIRUSES

Text Books

Biswas, SB & Biswas, A(1997). An introduction to viruses. 4th Ed. Vikas pub. House Pvt. Ltd. New Delhi.

References

Cooper, J.J. (1995). Viruses and the environment. (2nd ed) Chapman & Hall, London. Nayudu, M.V. (2008). Plant viruses. Tata McGraw-Hill Education. New Delhi. Mandahar, C.I. (1987). Introduction to plant viruses, S. Chand & company, Pvt. Ltd. New Delhi.

PU- B.Sc., Botany (College), 2021-22/ 2 Credit /1hrs/Week/15 hrs/II SEM SEMSETR- II SKILL BASED ELECTIVE COURSE – I: SUBJECT CODE: 21UBOS01 MUSHROOM TECHNOLOGY

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.

3 hrs

3 hrs

3hrs

3 hrs

References:

- Manjit Singh, Bhuvnesh vijay, Shwet kamal, GC Wakchaure (Eds.) 2011. Mushroomscultivation, marketing and consumption. Directorate of Mushroom research, ICAR, Chambaghat, Solan, HP-173213.
- Marimuthu, T, Krishnamoorthy, AS, Sivaprakasam, K & Jayarajan, R (1991). Oyster Mushrooms. Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.

Nita Bahl (1984-1988). Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

Swaminathan, M. (1990). Food and Nutrition. Bappeo, The Bangalore Printing and Publishing Co. Ltd., Bangalore.

Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications. New Delhi.

PU-B.Sc., Botany (College), 2021-22/4Credit /4hrs/Week/60hrs/III SEM SEMESTER -III CORE COURSE -IV, SUBJECT CODE: 21UBO03 PLANT DIVERSITY- III (PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY)

UNIT I

10 hrs

10 hrs

10 hrs

15 hrs

Pteridophytes: General characteristics Classification (Reimers 1954). Sporangial organization – Homospory, Heterospory and seed habit. Aposopory and Apogamy. Stelar evolution. Ecological and economic importance of Pteridophytes

UNIT II

Morphology, Anatomy, Reproduction and life cycle of Lycopodium, Selaginella, Equisetum.

UNIT III

Morphology, Anatomy, Reproduction and life cycle of Gleichenia, Adiantum and Marsilea

UNIT IV

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

Pandey et al., (1998). A Text Book of Botany Vol. II. S. Chand & Co. Ltd.
Pandey.B.P.(1977). A Text book of Bryophyta, Pteridophyta and Gymnosperms.
K.Nath and Co., Meerut.
Parihar.N.S.(1977). An introduction to Embryology. Vol-II. Pteridophyta and Gymnosperms. K.Nath and Co, Meerut.
Shukla.A.C and Misra.S.P 1982 Essentials of Palaeobotany, Vikas publishing house Pvt Ltd., Delhi.
Vasishta BR, Sinha AK & Anilkumar. (2005). Botany for degree students:
Pteridophytes. S Chand, New Delhi.
Vashishta. P.C (1972). Botany for Degree Students, Vol IV-Vascular Cryptogams (Pteridophyta), S.Chand & Co Pvt Ltd.
Vashista.P.C. (1976). Gymnosperms, S.Chand & Co Pvt Ltd, 1976.
Vasishta PC, Sinha AK & Anilkumar. (2005). Botany for degree students:

Gymnosperms. S Chand and Company Ltd., New Delhi.

References

Arnolds, C.A.(1947). An Introduction to Paleobaotany, McGraw Hill Book Co., New York.

Chamberlin, C.J. (1934). Gymnosperms: structure and Evolution. Chicago repreinted 1950. NewYork.

Eames, A.J.(1936). Morphology of lower vascular plants. Tata McGraw Hill Publishing Co., New Delhi.

Rashid, A. (1976). An Introduction to Pteridophytes. Vikas Publishing House, New Delhi.

Shukala, A.C and Sharma. M.(1992). Plant fossils. A link with the past, Birbal Shani Institute of Paleobotany, Lucknow, India.

Smith, G.M. (1935). Cryptogamic Botany. Vol-III, Tata McGraw Hill Publishing Co., New Delhi.

Sporne, KR. (1975). The Morphology of Pteridophytes, Hutchinson & Co., London.

Sporne, KR. (1967). The Morphology of Gymnosperms, Hutchinson & Co., London.

Sporne, K.R.(1991). The Morphology of Gymnosperms. B.I. publications Pvt., Mumbai

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

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

UNIT II

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

Cultivation Technology: Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, 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, maize straw, banana leaves. 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

UNIT V

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

Marimuthu, T, Krishnamoorthy, AS, Sivaprakasam, K & Jayarajan R (1991). Oyster Mushrooms. Department of Plant Pathology, TNAU, Coimbatore.
Swaminathan, M. (1990). Food and Nutrition. Bappco. The Bangalore Printing and Publishing Co. Ltd., Bangalore - 560018.
Tewari, & Pankaj Kapoor, SC (1988). Mushroom cultivation. Mittal Publications.
New Delhi.
Nita Bahl (2009). Hand book on Mushrooms. Oxford & IBH Publishers. New Delhi.

Tripathi, DP (2005). Mushroom Cultivation. Oxford & IBH Publishers. New Delhi. Muthusamy, AD & Yesuraja, I (1999). Mushrooms Culture. TNAU Publishers New Delhi.

6hrs

6 hrs

6hrs

6hrs

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

SEMESTER –IV CORE COURSE – VI SUBJECT CODE: 21 UBO04 ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS

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, Diacytic 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.

15hrs

10hrs

10 hrs

10hrs

PERIYAR UNIVERSITY, SALEM – 636011

B.Sc., BOTANY

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.

3. Normal secondary thickening in Dicot stem and root.

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

Pandey B,P., (2015)(Edn.) Plant Anatomy S. Chand Publ. New Delhi.

Pijushroy,(2010). Plant Anatomy, New central Book Agency, Pvt. Ltd, New Delhi. Vashista P.C (1984). *Plant Anatomy* – Pradeep publication, Jalandhar

References

Cutter, E.G. (1970). Plant Anatomy: Experimental and interpretation. Edward, ArnoldPub. Ltd., London.

Cutter, E.G. (1971). Plant Anatomy, Edward Arnold Pub. Ltd., London.

Cutter, E.G. (1978). Plant Anatomy, Experimental and Interpretation. Edward Arnold Pub.Ltd., London.

Esau, K.(1960). Plant Anatomy, Wiley Eastern Private Ltd., New Delhi.

Esau, K.(1977). Anatomy of seed plants. Wiley Eastern Publication, New Delhi.

Fahn, A.(1989). Plant Anatomy. Macmillan Publication (P) Ltd, Singapore.

Coutler E.G (1969) Plant Anatomy-Part1 Cells and Tissues –Edward Arnold London.

EMBRYOLOGY

Text Books

Bhatnagar, SP, Dantu, PK and Bhojwani, SS. (2014). The Embryology of Angiosperms 6thEditionVikas Publishing House. Delhi.

Bhojwani, SS. and Bhatnagar, SP. (2011). The Embryology of Angiosperms.

5thEdition, Vikas Publishing House. Delhi.

Pandey, AK. (2000). Introduction to Embryology of Angiosperms. 1stEdition: CBS; New Delhi.

Maheswari, P. (1976). An introduction to the Embryology of Angiosperms. TATA McGraw-Hill Publishing Co., Ltd., New Delhi.

References

Johri, BMI (1984). Embryology of Angiosperms. Springer-Verlag.

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

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

UNIT II

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

UNIT III

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

UNIT IV

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

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

John Jothi Prakash, E. (2003).Medicinal Botany and Pharmacognosy. JPRPub,
Vallioor, Tirunelveli.
Gokhale SB Kokate CK & Purohit AP (1995). Pharmacognosy.NiraliPrakashan,Pune.
Prajapathi, Purohit, Sharma and Kumar. (2003). A Hand book of Medicinal plants.
Agrobios Publications, Jodhpur.
Kumar,NC (1993). An Introduction to Medical Botany and Pharmacognosy.
Chopra RN,Nayar SL andChopra IC(1956). Glossary of Indian medicinal plants. CSIR, New Delhi.

6 hrs

6 hrs

6hrs

6 hrs

References

Kanny, Lall, Dey and Raj Bahadur, (1984). The indigenous drugs of India,International Book Distributors. Sivarajan VV and Balachandran Indra (1994). Ayurvedic drugs and their plant source.

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

SEMESTER –V CORE COURSE – VII SUBJECT CODE:21UBO05 MORPHOLOGY AND TAXONOMY OF ANGIOSPERMS

UNIT I

The plant body (Parts). Root types and Modification. Stem – Types Aerial and underground Stem modification. Leaf: Morphology; Types; Venation; Phyllotaxy.

UNIT II

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

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

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, Caesalpiniaceae and Fabaceae), Myrtaceae, Cucurbitaceae, Apiaceae,

UNIT V

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

$20 \ hrs$

20 hrs

15hrs

15hrs

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

Lawrence, GHM. (1995). The Taxonomy of vascular Plants (Vol I-IV), Central Book, Dept., Allahabad.

Heywood VH. (1967). Plant Taxonomy, Edward Arnold, London.

Jeffery C. (1982). An introduction to Plant Taxonomy, J& A Churchill Ltd., London. Sivaraajan VV(1989). Introduction to Principle of Plant Taxonomy, Oxford and IBH,

New Delhi.

Pandey BP(1997). Taxonomy of Angiosperms , S.Chand & Co., New Delhi.

Singh, V. & Jain, KK (1989). Taxonomy of Angiosperms – Rastogi, Meerut.

Vashista, PC (1990). Taxonomy of Angiosperms – S.Chand & Co., New Delhi.

Sharma, O.P. (1996). Plant Taxonomy. TATA McGraw Hill, New Delhi.

Gurcharan Singh. (2016). Plants Systematics 3 edition.CRC Press.

References

Hutchinson, J. (1973). The Families of Floweing plants, Oxford University press, London.

Gamble, J.S., Fisher, L.E.F. (1967). The Flora of The presidency of madras (Vol-III) BSI, Calcutta.

Davis, P.H and Heywood, V.M. (1965). Principles of Angiosperm Taxonomy, Oliver and Boyd Edinburgh.

Mathew, K.M. (1983). The Flora of Tamil Nadu Carnatic, The Rapinat Herbarium, Trichy.

Simpson MG(2006). Plant systematics, Elsevier Academic Press, USA.

Takhtajan, AL. (1969). Flowering Plants – Origin and dispersal – Oliver & Boyed.

Gangulee HC Das KS and Datta CT (1964). College Botany – Vol I, Basant Panchami, Calcutta.

Narayanaswamy RV and Rao,KN(1976). Outline of botany. S .Viswanthan printer and publisher ,Chennai.

Heywood VH (1967). Plant Taxonomy. London: Edward Arnold.

Hill AF 1982. Economic Botany.: Mc Graw Hill, New York. 1Jain SK and Rao RR (1976). A hand book of field and herbarium technique. Today andtomorrow,,s Publishers, New Delhi. Jeffery C (1968). An Introduction to Plant Taxonomy, J and A Churchill. London.

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

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

CYTOLOGY

UNIT I History and Development of cell biology.

Techniques of Cell Biology: Purification of cells and their parts. Cell separation and culture, flow cytometry, Fractionation of cell contents, Tracing cellular molecules with radioactive isotopes and antibodies.

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 IV15 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. RNA Structure and types. Cell division- Amitosis, mitosis and meiosis. Gene regulation – Lac operon.

15hrs

15hrs

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

Rastogi, SC (1992). Cell biology. Tata McGrew-Hill, New Delhi. Sundararajan ,S (2000). Cytology. Anmol publication (P) Ltd, New Delhi.

References

Dyansager, V.R (1986). Cytology and Genetics. Tata McGrew-Hill, New Delhi. Freifelder, D.(1993). Essentials of Molecular Biology. Jones & Bartlett, Boston. Karp, G (1995). Cell and Molecular Biology. John Wiley and Sons, New York.

PU-B.Sc., Botany (College), 2021-225Credit /5hr/Week/75/VSEM

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

SEMESTER -- V CORE COURSE IXSUBJECT CODE: 21UBO07 **GENETICS and PLANT BREEDING**

GENETICS

UNIT I

Mendelian genetics - Mendel"s laws of inheritance -Monohybrid, Dihybrid Cross. Incomplete dominance and Complementary interaction of genes, Epistasis and lethal alleles.

Multiple alleles- general account: ABO blood group in man.

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. Polyploid 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

15 hrs.

15hrs

15hrs

15hrs

Verma, P.S. & V.K. Agarwal, 2003, Genetics. S. Chand & Co.Ltd., New Delhi

References

Lewin (2007). Gene IX. Jones and Barlett Pub.ISBN. O 7637 5222 3 Brown, T.A.(2006). Genomes 3, Garland science, New York. Gupta, PK.(2002).Genetics. Rastogi publishers, Meerut. Meyyan RP (2000) genetics , Saras Publication, Nagercoil. Strickberger, M.W(1999).Genetics. Prentice Hall of India Pvt Ltd., New Delhi. Singh. B.D (2000).Fundamentals of Genetics. Kalyani Publishers, NewDelhi. Mirta, S (1994).Genetics- A Blue print of life. Tata McGraw Hill,New Delhi.

PLANT BREEDING

Text Books

Chauduri, HK. (1971). Elementary Principles of Plant Breeding, Oxford and IBH Co., New Delhi.

Singh BD (2002). Plant Breeding. Kalyani Publishers, Ludhiana.

Gupta SK (2010). Practical Plant Breeding. Second ed., Agrobios (India) Jodhpur. Allard RW (1960). Principles of Plant Breeding. John Willey and Sons, Inc.

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

Biosaftey 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

Kumaresan, V(2009). Biotechnology. Saras Publications, Nagercoil, Dubey, RC (2004). A text book of Biotechnology. 3rd Ed.S.Chand& Co. New Delhi. Gupta, PK.(2004). Elements of Biotechnology. Ist ed. Rastogi publications – Meerut. Purohit, SS.(2005). Biotechnology Fundamentals & Applications. 3rd Ed. Mrs. Saraswathi Purohit for student Edition, India.

Razdan, MK (2008) Introduction to plant tissue culture.2nd ed. Oxford & IBH publishing Co. Pvt. Ltd., New Delhi.

15hrs

15hrs

15hrs

15hrs

References

Brown TA (2006). Gene cloning and DNA analysis. Blackwell scientific publishers Prime rose SB, Twyman RM & old RW (2001). Principle of gene manipulation; an Introduction to genetic engineering. 6th Ed Blackwell oxford.

PU- B.Sc., Botany (College), 2021-2122Credit /2hr/Week/30hr/V SEM SEMESTER –V SKILL BASED ELECTIVE COURSE -IV SUBJECT CODE: 21UBOS04 AGRICULTURAL MICROBIOLOGY

UNIT I

General characterization – Soil microflora- Bacteria, Fungi, Actinomycetes, Algae and Phosphate solubilizing bacteria. Rhizosphere and non rhizosphere concept. Role of Rhizosphere microorganisms in soil fertility.

UNIT II

Nitrogen cycle in nature- biological N₂ fixation. Symbiotic and non-symbiotic bacteria. *Rhizobium* and *Azospirillum* -Isolation, Mass Production and Field application.

UNIT III

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

Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of AM – isolation and inoculum production of AM, and its influence on growth and yield of crop plants.

UNIT V

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

Dubey, RC (2005). Text book of Biotechnology S.Chand& Co, New Delhi.

Kumaresan, V(2005). Biotechnology, Saras Publications, New Delhi.

John Jothi Prakash, E (2004). Outlines of Plant Biotechnology. Emkay Publication, New Delhi.

Sathe, TV (2004). Vermiculture and Organic Farming. Daya publishers.

Subha Rao, NS (2000). Soil Microbiology, Oxford & IBH Publishers, New Delhi. Vayas, SC, Vayas, S. and Modi, HA (1998). Bio-fertilizers and organic Farming Akta Prakashan, Nadiad.

6hrs

6hrs

6hrs

6hrs

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**

UNITI

Basic principles of Light microscopes. Compound microscope, Phase contrast microscope, Scanning and Transmission Electron microscopes. Micrometry-Principle and Applications of Stage and Ocular micrometer. Haemocytometer.

UNIT II

Micro technique - preparation for microscopic observation - Whole mount, Smears, Squash, sections.

Microtomy: Fixation, Dehydration, Infiltration, Embedding, Sectioning.

Microtome's – Types- Principles and operating mechanisms of Rotary Microtome.

Stains and Staining techniques - Preparation of following stains: Safranin, Cotton blue in lactophenol, Acetocarmine, Methylene blue and Crystal violet.

UNIT III

Centrifugation: Principles, components, mechanism and application of clinical, Refrigerated and ultra-centrifuges.

Chromatography: Basic principles, types – Paper, Column, Thin layer.

Principle and Application of pH meter, Colorimetry and Spectrophotometer.

UNIT IV

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

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 wrok.

Microsoft excel for tabular and graph work.

Microsoft Power Point Presentation for preparing slides

Poster presentation.

Text Books

Patki L.R, Bhalchandra B.L, Jeevaji I.H.(1987). An introduction to Microtechnique, S.Chand and company (Pvt) Ltd, New Delhi.

Marimuthu, R. (2008). Microscopy and Microtechnique. MJP Publishers, Chennai. Wilson K, Walker, J. (1994). Principle and techniques of practical biochemistry,4thed) Cambridge University Press, Cambridge.

Palanivelu P (2013). Analytical Biochemistry and Separation techniques, 20th century publications, Palkalainage, Madurai.

Khan, I.A., and Khannum, A., (1994). Fundamentals of Biostatistics, Vikas Pub., Hyderabad

35

6hrs

6hrs

6hrs

6hrs

Sundar Rao P.S.S and Richard J(2011) introduction to Biostatistics and research methods , PHI learning private LtD , New Delhi.

Department of Foundation Course, "Computer Literacy", St. Joseph"s College, 2017.

References

Johansen, DA (1940). Plant Microtechnique, TATA McGraw Hill Book Co., Ins., New Delhi.

Peter Gray (1964). Hand book of Basic Microtechnique. McGraw Hill Pub,New York. Steven Ruzin (2005).Plant Microtechnique and Microscopy. Oxford University Press, London.

Cooper.TG (1991).The Tools of Bio-chemistry, John Wiley &sons, London.

Dey P.M. and Harborne, JB (2000). Plant Biochemistry Harcourt Asia Pvt. Ltd.

Plummer DT (2003). An introduction to practical Biochemistry. 3rd Edn. Tata

McGraw Hill Publishing Company Ltd. New Delhi.

Zar, JH (1984). Biostatistics Analysis, Prentice Hall International, England Cliffs, New Jersy,.

Alexis Leon, "Introduction to computers", Vikas Publishing House Pvt. Ltd., New Delhi, 2008. 2. Alexis Leon and Mathew Leon, "Introduction to computers with Ms Office 2000", Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2005.

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

SEMESTER –VI CORE COURSE – XI SUBJECT CODE :21UBO08 PLANT PHYSIOLOGY

UNIT I

15hrs

15hrs

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

Photosynthesis- Photosynthetic pigments - Concept of photosynthetic unit – Emerson s enhancement effect – Stages of photosynthesis – light reactions – cyclic and non-cyclic photophosphorylation. Calvin cycle. C4 and CAM pathway. Photorespiration (Brief study only). Factors affecting photosynthesis.

UNIT III

Respiration – Aerobic and Anaerobic respiration. Glycolysis, Krebs cycle, Electron transport System. Oxidative phosphorylation. Factors affecting respiration.

UNIT IV

Nitrogen Metabolism: nitrogen fixation- nitrification and denitrification. Nitrate assimilation- Synthesis of amino acids - Reductive amination and Transamination. Stress physiology –Definition - water stress, salt.

UNIT V

Plant Growth regulators – Types of plant hormones – Auxins, Cytokinins, Gibberellins, Abscisic acid, Salicylic acid and Ethylene. Photomorphogensis- Phytochrome – photoperiodism. Vernalization. Senescence. Plant movements.

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"spotometer
- 6. Separation of plant pigments by paper chromatography.
- 7. To study the effect of light intensity on Photosynthesis by using Wilmotts bubbler
- 8. To study the effect of and concentration of CO₂ on Photosynthesis by using Wilmott"s bubbler

15hrs

15hrs

15Hrs

37

- 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

Pandey, SN and Sinha, BK (2001). Plant Physiology. Third revised edition, Vikas publishing House Pvt. Ltd, New Delhi

Devlin, RM (1974). Plant Physiology, Affiliated East West Press Pvt. Ltd

- Noggle, GR. and Fritz, GJ (1976). Introductory Plant Physiology, Prentice Hall, India.
- Jain ,VK (2007). Fundamentals of plant physiology , S. Chand &Compamy ltd, New Delhi.
- Nobel, PS (1970). Introduction to Biophysical Plant Physiology. W. H. Freeman and Company, San Francisco

Verma, V(2008). Text book of plant Physiology, Ane^s's student edition, New Delhi.

Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

References

Beevers, L (1976). Nitrogen metabolism in plants. William & Sons Ltd. London.

Bray, CM (1983). Nitrogen Metabolism in Plants. Longman.

Kramer, PJ (1969).Plant and soil water relationship- A Modern Synthesis.

Salisbury, F B and Ross, CW (1986). Plant Physiology. Third edition, CBS Publishers and Distributors, New Delhi

Levitt (1972). Responses of plants to environmental stress. Academic press, New York. Bidwell RGS (1979). Plant Physiology, Mac Millan Publishing Company. New Delhi. Taiz, L and Zeiger, E (1991). Plant physiology. The Benjamin/Cummings Publishing company, Inc., California, New York.

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

PU-B.Sc., Botany (College), 2021-22/ 5Credit /5hr/Week/75hr/VISEM

SEMESTER –VI CORE COURSE – XII SUBJECT CODE: 21UBO09 PLANT ECOLOGY AND PLANT GEOGRAPHY

UNIT I

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

UNIT II

Ecosystem concept: Ecosystem components (Abiotic and Biotic) –Autotrophs, Heterotrophs. Ecosystem function: Ecological pyramids. Productivity of ecosystem -Primary Productivity –Gross primary productivity -Net primary productivity-Net productivity- Secondary productivity. Food chain. Food web. Biogeochemical cycling: Cycling of carbon, nitrogen and Phosphorous. Pond ecosystem.

UNIT III

Succession – Types of Succession.Process of Succession - Nudation - migration -Ecesis aggregation - competition -Reaction –climax. Hydrarch and Xerarch succession. Ecological group of plants – Hydrophytes, Mesophytes, Xerophytes, parasites, epiphytes and halophytes.

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.

15hrs

15hrs

15hrs

15hrs

Text Books

Sharma, P.D (2009).Ecology and Environment. Rastogi Publications.
Shukla, R.S. &P.S. Chandel (1991) : Plant Ecology & Soil Science. S.Chand & Co., New Delhi
Vasishta, P.C, 1979 Plant Ecology. Vishal Publication.
Verma, V,A 1981 Text Book of plant Ecology. Emkay Publication.
Sharma, J.P.2004 Environmental Studies. Laxmi Publications (P) Ltd. New Delhi.

References

Ambasht RS (1978). The Book of Plant Ecology. Students friends Co.
Willings WD (1964).Plants and Ecosystem. Wasworti Publishing Co.
Daubenmire RF (1973). Plant and Environment. John Willey.
Gopal B and Bhardwaj (1979). Elements of Ecology. Vikas Pub. House Pvt. Ltd.
Cain SA (1944). Foundations of Plant Geography. Harper & Brothers, N.Y.
Mani MS (1974). Ecology & Biogeography of India. Dr. W. Junk Publishers, The Haque
Good, R. (1997). The Geography of flowering Plants (2ndEdn.,) Longmans,
Green & Co., Inc., London & Allied Science Publishers, New Delhi-495pp.,

PU- B.Sc., Botany (College), 2021-22/5Credit /5hrs/Week/75hrs/VI SEM SEMESTER –VI CORE COURSE –XIII SUBJECT CODE:21UBO10 PLANT PROTECTION

UNIT I

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

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

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

Characteristic features of plant pathogenic bacteria. General symptoms of bacterial diseases.Survival and spread of bacterial plant pathogens. Insect transmission of bacteria. Study of symptoms, etiology and control measures of the following diseases: Soft rot of Vegetables, Bacterial blight of rice, canker disease of citrus, ring rot of potato.

UNIT V

Nature of Plant Virus.Transmission of plant viruses. Causal organism, symptoms, control measures of Viral diseases: Tobacco Mosaic, Bunchy top of banana, Mosaic disease of Lady"s finger, Leaf Mosaic of Tapioca.

General account of Mycoplasma with reference to Little leaf of brinjal and Papaya leaf curl

PRACTICAL

1. Collection and study of diseased plant materials.

- 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

Chaudhury and Majid, (1954).Hand Book of plant protection. Department of Agriculture, Government press, Shillong, Assam.

Agros, GN (1997) Plant Pathology (4th ed.) Academic Press.

Bilgrami KH. and Dube HC (1976). A textbook of Modern Plant Pathology.

International Book Distributing Co. Lucknow.

Mehrotra, RS (1980). Plant Pathology - TMH, New Delhi.

Pandey, BP. (1999). Plant Pathology-Pathogen and Plant diseases. Chand & Co. New

15 hrs

15 hrs

15 hrs

15 hrs

Delhi.

Rangaswami, G (1999). Disease of Crop plants of India. Prentice Hall of India Pvt. Ltd. Sharma PD(2004). Plant Pathology. Rastogi Publishers.

PU-B.Sc., Botany (College), 2021-22/5Credit /5hrs/Week/75hrs/VI SEM SEMESTER-VI MAJOR ELECTIVE COURSE - II SUBJECT CODE: 21UBOE02

BIOCHEMISTRY

UNIT I

Atomic structure of elements. Bonding: Covalent and non-covalent bonds - Hydrogen bond, Van der Waal"s forces. Structure and properties of water, Acids and Bases - pH and Buffer system.

UNIT II

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

UNIT III

Amino acids: Basic structure & properties (physical and chemical); function, Essential and standard amino acids. Proteins: structure-peptide bond -solubility and composition. The peptide bond- primary structure- secondary structure- tertiarystructure -quaternary structure-function of protein

UNIT IV

Enzymes: Nomenclature, classification -mechanism and regulation of enzyme action, enzyme kinetics, factors affecting enzymeaction.

UNIT V

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

Rastogi, S.C (2003). Outlines of Biochemistry, CBS Publishers & Distributors, New Delhi

Stryer, L., (1988). Biochemistry, WH Freeman & Co., NY.

Jain J.L. et al., (2008). Fundamentals of Biochemistry, Chand, New Delhi.

Conn et al.(2005) . Outlines of Biochmistry 5/Ed, Wiley&Sons Pvt. Ltd.

Satyanaryana U, Chakrapaani U, (2006). Biochemistry, Books and Allied (P)Ltd.

References

Apps et al., (1992). Biochemistry. ELBS.

Caret et al., (1993). Inorganic, Organic and Biological Chemistry, WMC Brown Pub. USA.

Nelson D.L, Cox M.M.(2005). Lehninger Principle of Biochemistry, W.H. freeman and Company, New York.

Rawn, D. (1989). Biochemistry, Neil Patterson.

Zuley G.L., (1998). Biochemistry, Wm.C. Brown Publishers USA.

PU-B.Sc., Botany (College), 2020-21/ 2 Credit /2hrs/Week/30 hrs/SEM

15hrs

15hrs

15hrs

15hrs

PU-B.Sc., Botany (College), 2021-2122 Credit /2hrs/Week/30hrs/VI SEM

SEMESTER -- VI

SKILL BASED ELECTIVE COURES -VIIISUBJECT CODE: 21UBOS07 SEED TECHNOLOGY

UNIT I

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

Seed sampling – Method of sampling – Seed Purity – Seed Germination – Methods of Seed Germination using paper, Sand or soil – Standard Germination Test. Seed dormancy.

UNIT III

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

UNIT IV

Certified seed production of the following: Paddy, groundnut and cotton.

UNIT V

Seed certification – objectives – fundamental concepts of seed certification – sources and classes of seed: Breeder's seed, certified seed. Seed analysis – Tagging of seedlings – field standards.

References:

Agarwal, R.L. Seed Technology Oxford and IBH Publishing Co. Pvt. Ltd., Bewley J.D. and Black M (Edn) 1985 – Seed Physiology of development and germination. Plenum Press, New York. Kowslowsky. Seed Biology. Vol. I, Vol. II and Vol. III. Academic Press, New York.

6hrs

6hrs

6hrs

6hrs

45

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

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

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

UNIT I

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 Albugo, Penicillium and Agaricus. Economic importance of fungi

UNIT II

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

Pteridophytes and Gymnosperms: Structure and lifecycle of Lycopdium and Cycas.

UNIT IV

Plant Physiology: Osmosis, absorption of water. Photosynthesis-Light reaction, Calvin cycle. Transpiration– types, mechanism of stomatal movement. Nitrogen cycle.

Hormones (Auxins only).

UNIT V

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

Text books

Fuller HJ and Trippo O. (1949). College Botany, Henry Holt & Co. Ganguly AK (1975) General Botany Vol I (1971) & Vol II, The New Book Stall, Calcutta. Rao, K., Krishnamurthy, KV and Rao GS (1979). Ancillary Botany, S. Viswanathan Pvt. Ltd., Madras. Palaniappan, S. (1985). Thavaraviyal Thunaippaadam (Tamil), Mohan Padippagam, Chennai. Pandey BP (1986). Text Book of Botany (College Botany) Vol I and II, S.Chand and Co. New Delhi. Rasool SK and Sekar T (2002). Allied Botany, Popular Book House, Chennai -15.

12 hrs

12hrs

12 hrs

12 hrs

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

Morphology of Plant: Plant and its parts. Structure and function of Root and Stem. Leafand 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

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

Cytology: Ultra structure of plant cell and brief outline of cell wall, Plasma membrane, Endoplasmic reticulum, Mitochondria, Chloroplast, Nucleus. Cell division - Mitosis and Meiosis. Genetics-Mendel"s law. Mono and dihybrid cross.

UNIT IV

Anatomy: Meristem. Simple permanent tissues - Parenchyma, Collenchyma, Sclerenchyma. Complex permanent tissues - Xylem and Pholem.

Primary structure of Dicot stem, Dicot root and Dicot Leaf. (Mesophytic only)

UNIT V

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

12hrs

12hrs

12hrs

12hrs

- 4. Pisum sativum Pea
- 5. Phaseolus mungo-Blackgram
- 6. Phaseolus radiatus-Greengram
- 7. Tamarindus indica Fruit
- 8. Abrus 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

Fuller HJ and Tippo O. (1949). College Botany, Henry Holt & Co.

Ganguly AK (1975) General Botany Vol I (1971) &Vol II, The New Book Stall, Calcutta.

Rao, K. Krishnamurthy, KV and Rao GS (1979) Ancillary Botany, S. Viswanathan Pvt. Ltd., Madras.

Palaniappan, S. (1985) . Thavaraviyal Thunaippaadam (Tamil) Vol I and II, Mohan Padippagam, Chennai.

Pandey B.P, 1986, Text Book of Botany (College Botany) Vol I and II, S.Chand and Co. New Delhi.

Rasool SK and Sekar T (2002). Allied Botany, Popular Book House, Chennai -15.

B.Sc., BOTANY MAJOR AND ALLIED BOTANY 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

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

1. Cut transverse section of A, B and C. Stain and mount in glycerin. Identi Draw diagrams. Leave the slides for valuation.	fy giving reason. (7X3=21)
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. (D Necessary)	iagrams not 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) D - Algae- slide E - Fungi- slide F - Bryophyte-slide	(7X3=21)
 G - Lichens- fruit body Bacteria/ Viruses- electron micrograph (Identification -1, Diagram -1, Reason -2) H - Algae I - Fungi 	(4X4=16)
J - Bryophytes (Genus 1, Group 1, Morphology 1)	(3X3=9)
K – Algae/Fungi L- Bacteria/Viruses (identification 1, importance 1)	(2X2=4)

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

(4Marks)

(2X3=6marks)

(5X2=10marks)

1. Cut transverses sections of A, B and C. Stain and mount in glycerin. Ide	entify giving
Reasons. Draw diagrams. Leave the slides for valuation.	(4X6=24 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. Name the genus, group and morphology of given part of F and G.

5. Write notes on H, I, J, K and L.

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)

- H, I, J, K and L. Permanent slides (Anatomy, Embryology, Pteridophytes,
 - Gymnosperms, Fossil slides) (Identification 1, Reason 1) (5X2=10)

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

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)

Time: 3 hrs.

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

1. Refer A and B, to their respective families. Point out the characters on whic each level. (Diagrams not necessary)	h the identification is based at (2X4=8 Marks)
2. Make acetocarmine preparation of C (Squash) any one stage. draw diagram	n. 4 Marks
3. Describe D in Technical terms. Draw diagrams of the floral parts only. Co Diagram. Give the floral formula	onstruct the floral 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	l parts of J and K – (4X2=8 Marks)
 Briefly describe the plant breeding technique in spotter L Key 	3 Marks
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, Flo	oral 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-1ma	rk, Morphology -1 mark
L- Any Plant breeding technique-	- 3 marks

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

MODEL QUESTION PAPER

B. Sc., Botany Degree Examination ((For Students Admitted from the Academic Year 2021 – 2022onwards 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. (16marks)

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	E". Draw diagrams.
Describe the symptoms and list the control measures.	(2X8=16)

4. Comment on "F"

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

2 Marks

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	$2 \ge 5 = 10 \text{ mark}$
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 \ge 6 = 12 $ mark
5. Physiology Experiment P	3 Mark