



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 programmes 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/Electives subjects” related to the core subjects of the programme concerned. |
| Part IV | (i) - | “Non-Major Electives” means option is being given to students who do not 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 <ol style="list-style-type: none"> 1) Environmental Studies (1st year) 2) Value Education- Yoga (1st year) 3) Professional English for Life Science 4) Nanmudhalva course like office fundamentals and medical coding to enhance employability |
| Part V | - | “Extension Activities” means all those activities which form part of NSS/NCC/Sports/YRC and other co and extracurricular activities. |

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:

Mean the weightage given to each course of study (subjects) attributed by the experts of the Board of Studies concerned.

Credit System:

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

For Undergraduate Programme (Three years) : 148

AIM AND SCOPE OF THE COURSE:

1. To acquire knowledge in different areas of plant science.
2. The topics included in different units of different papers would enable the students to develop technical skills in Basic Botany and its applied branches.
3. Skill based subjects 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 provide foundation for entrepreneurship.
5. Practicals included in the syllabus will improve the skills of the students in Microscopic techniques, Observations, Drawing and Physiological and Ecological Laboratory techniques.

ELIGIBILITYFORADMISSION:

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.

DURATION OF THE COURSE:

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

PASSING MINIMUM:

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

DISTRIBUTION OF MARKS:

THEORY

University examination = 75 marks
Internal assessment = 25 marks

INTERNAL ASSESSMENT STRUCTURE:

Test = 15 marks
Assignments = 05 marks
Attendance = 05 marks
Passing minimum for Internal Assessment = 10 marks
Passing minimum of University examinations = 30 marks

PRACTICALS

University Examinations = 60 marks
Internal Assessment = 40 marks

INTERNAL ASSESSMENT STRUCTURE:

Submission-10 Marks Test-10 Marks Attendance-5 Marks Total-40 Marks

Submission = 10 marks
Test = 10 marks
Regularity in Practical = 10 marks
Continues assessment = 10 Marks

Passing minimum for internal assessment = 10 marks

Passing minimum for University examinations = 30 marks

CLASSIFICATION OF SUCCESSFUL CANDIDATES:

- Candidates whose 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 whose secure above 50% and below 60% shall be declared to have passed the examinations in Second class.
- Other successful candidates whose secure below 50% shall be declared to have passed the examination in Third class.

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B.Sc.,BOTANY

CourseStructure(CBCS)

B.ScBOTANYCOURSESTRUCTUREFROMTHEYEAR2021-2022ONWARDS

Sem	Part	Course	IntHrs	Credit	ExamHrs	Marks		
						CI A	EA	Total
I	I	LanguagepaperI	6	3	3	25	75	100
	II	CommunicativeEnglishpaperI	6	3	3	25	75	100
	II	ProfessionalEnglishI	2	4	3	25	75	100
	III	CoreCourse I (PlantDiversityI)	4	5	3	25	75	100
	III	CoreCourse II (MajorPractical I)	3	(PracticalAssessmentandcreditcarriedto IIsemCoreCourseII)				
	III	FirstAllied –IZoology/Chemistry	4	3	3	25	75	100
	III	FirstAllied–IPractical Zoology/Chemistry	3	PracticalAssessmentandcreditcarriedto IIsemAlliedCourseII				
	IV	EnvironmentalStudies	1					
	IV	ValueEducation	1	2	3	25	75	100
			TOTAL	30	20			600
II	I	LanguagepaperII	6	3	3	25	75	100
	II	CommunicativeEnglishpaperII	4	3	3	25	75	100
	II	ProfessionalEnglishII	2	2	3	25	75	100
	II	NanMudhalvan-EffectiveEnglish	2	2	3	25	75	100
	III	CoreCourse III (PlantDiversityII)	4	3	3	25	75	100
	III	CorecourseII (MajorPracticalI)	3	3	3	40	60	100
	III	FirstAllied-IIZoology/Chemistry	4	4	3	25	75	100
	III	Firstallied–IZoology/Chemistry (Practical)	3	3	3	40	60	100
	IV	EnvironmentalStudies	1	2	3	25	75	100
	IV	SBECIMushroomTechnology	1	2	3	25	75	100
		TOTAL	30	27			1000	
III	I	LanguagepaperIII	6	3	3	25	75	100
	II	CommunicativeEnglish-III	6	3	3	25	75	100
	III	Corecourse–IV (PlantDiversityIII)	4	4	3	25	75	100
	III	CorecourseV (MajorPracticalII)	3	(PracticalAssessmentandcreditcarriedto IVSemCoreCourseV)				
	III	SecondAllied–IZoology/ Chemistry	4	4	3	25	75	100
	III	SecondAlliedpracticalII Zoology/Chemistry	3	(PracticalAssessmentandcreditcarriedto IV SemSecond alliedII)				
IV	IV	Employability Skills-Microsoft	2	2	3	25	75	100
	IV	NMEC-I(MushroomCulture)	2	2	3	25	75	100
			30	18				600
	I	LanguagepaperIV	6	3	3	25	75	100
	II	CommunicativeEnglish-IV	6	3	3	25	75	100

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	III	Corecourse-VI (Anatomy&Embryologyof Angiosperms)	4	4	3	25	75	100
	III	CorecourseV (MajorPracticalII)	3	3	3	40	60	100
	III	SecondAllied-IIZoology/Chemistry	4	4	3	25	75	100
	III	SecondAlliedPracticalII Zoology/Chemistry	3	3	3	40	60	100
	IV	NanMudhalvan- Employability Skills- Microsoft	2	2	3	25	75	100
	IV	NMEC-IIHerbalBotany	2	2	3	25	75	100
		InternshipProgramme:Landscaping andOrnamentalGardening,Organic Farming, Waste Recycling and Vermicomposting, Mushroom Production, Nursery Techniques of Horticultural Plants, PreservationofFruitsand Vegetables,onlineinternshipetc.,...						
		TOTAL	30	24				800
V	III	CorecourseVII(Morphology &TaxonomyofAngiosperms)	5	5	3	25	75	100
	III	CorecourseVIII(CellBiology)	5	5	3	25	75	100
	III	CorecourseIX(GeneticsandPlant Breeding)	5	5	3	25	75	100
	III	CorecourseX(MajorPracticalIII) (CorecourseVII,VII&IX)	3	(PracticalAssessmentandcreditcarriedtoVISem CoreCourseX)				
	III	CorecourseXI(MajorPracticalIV) (Core courseX, XI & XII)	3	(PracticalAssessmentandcreditcarriedtoVISem Core Course XI)				
	III	MajorElectivecourseI (Plantand Environmental Biotechnology)	3	3	3	25	75	100
	IV	SBEC-IV – (AgriculturalMicrobiology)	2	2	3	25	75	100
	IV	SBEC-V-(BiologicalTechniquesand Computer Application)	2	2	3	25	75	100
	IV	Advanced Technology for Employability in Life Science – Food Analysis Food Processing & Preservation Methods	2	2	3	25	75	100
		EvaluationofInternship	0	0	viva			comment
		TOTAL	30	24				600
VI	III	CorecourseXII(Plant Physiology)	5	5	3	25	75	100
	III	CorecourseXIII(PlantEcology and Plant Geography)	5	5	3	25	75	100
	III	CorecourseXIV (PlantProtection)	5	5	3	25	75	100
	III	CorecourseX (MajorPracticalIII)(CorecourseVII, VII & IX)	3	4	4	40	60	100
	III	CorecourseXI (MajorPracticalIV)(CorecourseX, XI & XII)	3	4	4	40	60	100
	III	Majorelectivecourse (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	SBCEVII-SeedTechnology	2	2	3	25	75	100

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	IV	ExtensionActivities	1				
		TOTAL	30	32			800
		GRANDTOTAL		142			4200

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

SEMESTER-I

CORECOURSE–ISUBJECTCODE:21UBO01

PLANT DIVERSITY –I

(ALGAE&BRYOPHYTES)

ALGAE

UNIT I

15hrs

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

Habitandhabitatsoffreshwater,marineandsoilalgae.Pigment ation 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.

Significantcontributionsofimportantphycologists(F.E.Fritsch,T.V.Desikachary, M.O.P.Iyengar).

UNIT II

15hrs

A detailed study of Structure,Reproductionandlife cycle ofthe following algae genera:

Cyanophyceae: Oscillatoria, Anabaena,

Chlorophyceae: Chlamydomonas, Volvox and Oedogonium

Chlorophyceae: Caulerpa, Chara,

UNIT III

15hrs

A detailed study of Structure,Reproductionandlife cycle ofthe following algae genera:

Xanthophyceae: Vaucheria

Bacillariophyceae: Cyclotella,

Phaeophyceae: Sargassum

Rhodophyceae: Gracilaria

BRYOPHYTES

UNIT IV

15hrs

Bryophytes-General characteristics.Occurrence, Distribution and Classification (Rothmaler, 1951) of Bryophytes.

A detailed study of the Structure,Reproductionandlifecycles of the following genera –

Marchantia

UNIT V

15hrs

A detailed study of the Structure,Reproductionandlifecycles 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

TextBooks

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

Kumar, HD (1999). *Introductory Phycology*. 2nd edition. 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

TextBooks

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

Prem Puri (1981). *Bryophytes: Morphology, Growth and differentiation*. Atma Ramand Sons, New Delhi.

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

Smith,AJE(1982).Bryophyta:Ecology.ChapmanandHall.London.

Watson, EV (1968). British Mosses and Liverworts. Hutchinson and Co., London.

Watson,EV(1970).StructureandlifeofBryophytes.HutchinsonandCo.,London.

PU- B.Sc., Botany(College),2021-22/5Credit/4hrs/Week/60hrs/IISEM

SEMESTER-II

CORE COURSE -III SUBJECTCODE:21UBO02

PLANT DIVERSITY -II

(FUNGI,LICHENS,BACTREIAANDVIRUSES)

FUNGI

UNIT I

12 hrs

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

12 hrs

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

Oomycetes: Albugo,
Hemiascomycetes: Saccharomyces,
Plectomycetes: Aspergillus/Eurotium,
Pyrenomycetes: Neurospora,
Discomycetes: Peziza.

UNIT III

12 hrs

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

Teliomycetes: Puccinia,
Hymenomyces; Polyporus and
Deuteromycetes: Cercospora

LICHENS AND VIRUSES

UNIT IV

12 hrs

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

12 hrs

Bacteria - Major characteristics, Occurrence, Distribution, Classification of Bacteria.

Morphology of Bacterial cell - Ultra structure of Bacterial cell.

Mode of nutrition in bacteria - Photosynthetic and chemosynthetic.

Growth and Reproduction in Bacteria.

Wall-less forms (mycoplasma)

Economic importance of bacteria.

PRACTICAL:3hrs /Week

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

Fungi

Text Books

Alexopoulos, 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 Ma Graw Hill

PublishingHouse,New Delhi
PowarandDagainwala.(1994).GeneralMicrobiology.HimalayanpublishingHouse, 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).GeneralMicrobiology. MacMillan& Company.
London .

VIRUSES

TextBooks

Biswas,SB&Biswas,A(1997).Anintroductiontoviruses.4thEd.Vikaspub.House Pvt.
Ltd. New Delhi.

References

Cooper,J.J.(1995).Virusesandtheenvironment. (2nded)Chapman&Hall, London. Nayudu,
M.V. (2008). Plant viruses.Tata McGraw-Hill Education. New Delhi.
Mandahar,C.I.(1987).Introductiontoplantviruses,S.Chand&company,Pvt. Ltd. New
Delhi.

PU-B.Sc., Botany(College),2021-22/2Credit/1hrs/Week/15hrs/ISEM

SEMSETR-II

SKILLBASEDELECTIVECOURSE-I:SUBJECTCODE:21UBOS01

MUSHROOM TECHNOLOGY

UNIT I

3hrs

Introduction-historyofmushroomtechnology. Scope of edible mushroom cultivation.

Types of edible mushrooms available in India - temperate mushroom, sub-tropical mushroom and tropical mushroom.

Detail studyof*Pleurotus citrinopileatus*, *Agaricusbisporus*.

UNIT II

3hrs

Pureculture-preparationofmedium(PDAandOatmealagarmedium).Sterilization.

Preparationoftesttubeslantstostoremotherculture. Culturing of *Pleurotus* mycelium on Petri plates.

Preparationofmotherspawnsinsalinebottleandpolypropylenebagandtheir multiplication.

UNIT III

3hrs

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.

Mushroombed preparation -paddystraw, sugarcane trash.

Factorsaffectingthemushroombedpreparation- Lowcosttechnology.

UNIT IV

3hrs

Storageandnutrition:Short-termstorage(Refrigeration-upto24hours)Longterm Storage (canning, pickles, pappads), drying, storage in salt solutions.

Nutrition-Proteins-aminoacids,mineralelementsnutrition-Carbohydrates,Crude fibre content - Vitamins.

Medicinalvaluesofmushrooms

UNIT V

3hrs

FoodPreparation:Typesoffoodspreparedfrommushroom;Soup,Cutlet,Omelets, Samosa, Pickles, Curry.

Value added products of mushroom– mushroom soup powder, mushroombiscuit, mushroom nuggets, mushroom ketchup, candy, murabba, chips etc.

ResearchCenters-NationallevelandRegionallevel.

Costbenefitratio-MarketinginIndia andabroad, ExportValue.

References:

- Manjit Singh, Bhuvnesh vijay, Shwet kamal, GC Wakchaure (Eds.) 2011. Mushrooms-cultivation, 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. Bappa, 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/IISEM

SEMESTER-III

CORE COURSE -IV, SUBJECTCODE:21UBO03

PLANT DIVERSITY- III

(PTERIDOPHYTES,GYMNOSPERMSANDPALEOBOTANY)

UNIT I

10 hrs

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

UNIT II

10 hrs

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

UNIT III

10 hrs

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

UNIT IV

15 hrs

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

UNIT V

15 hrs

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 3 HRS/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.

TextBooks

- 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.CandMisra.S.P 1982EssentialsofPalaeobotany,VikaspublishinghousePvt Ltd.,
Delhi.
Vasishta BR, Sinha AK & Anilkumar. (2005). Botanyfor degree students:
Pteridophytes. S Chand, New Delhi.
Vashishta.P.C (1972).Botanyfor 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). AnIntroduction to Paleobaotany, McGraw Hill Book Co., New
York.
Chamberlin,C.J.(1934).Gymnosperms:structureandEvolution.Chicagoreprinted
1950.NewYork.
Eames,A.J.(1936). Morphologyofflowervascular plants. TataMcGraw Hill Publishing Co.,
New Delhi.
Rashid,A.(1976).AnIntroductiontoPteridophytes.VikasPublishingHouse,New Delhi.
Shukala, A.C andSharma.M.(1992). Plant fossils.A link withthe past, Birbal ShaniInstitute
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).TheMorphologyofGymnosperms.B.I.publicationsPvt.,Mumbai

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

SEMESTER- III

NON-MAJORELECTIVECOURSE-ISUBJECTCODE:21UBON01

MUSHROOM CULTURE

UNIT I

6hrs

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

UNIT II

6hrs

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

UNIT III

6hrs

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

6hrs

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

UNIT V

6 hrs

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

References

- 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). Handbook 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.

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

SEMESTER-IV

CORE COURSE – VI SUBJECT CODE: 21 UBO04

ANATOMYANDEMBRYOLOGYOFANGIOSPERMS

ANATOMY

UNIT- I

10hrs

Meristems:Classification,distribution,structureandfunction.
ShootapexandRootapexorganization.Theories:Histogen,Tunica-Corpusand quiescent center.
Simple permanent tissues: Parenchyma, Collenchyma, Sclerenchyma. (Fibers and Sclereids)

UNIT- II

15 hrs

Complex tissues: Xylem- Tracheids, Vessels, Xylem fibres and Xylem parenchyma.SecondaryXylem, Annual rings, Heart wood and Sap wood, Tyloses.
Phloem: Sieve elements,companion cells, phloemfibre and phloem parenchyma.
Secondaryphloem.
Epidermaltissues:Stomataltypes:Anomocytic,Anisocytic,Paracytic,Diacyticand Graminaceous.
Groundtissuesandvascular tissues- types.Trichomes- Types.

UNIT- III

15hrs

Primaryand secondarystructureofDicotStem andRoot.
Anomalousecondarygrowthinstemsof*Nyctanthes,Boerhaavia,Dracaena*.
Anomalous secondary growth in roots of *Beta vulgaris*
Primarystructureofmonocotstemandroot.Structure of Dicot and Monocot leaf.
Nodal anatomy- Uni, triandmultilacunar node.

EMBRYOLOGYOFANGIOSPERMS

UNIT- IV

10hrs

StructureanddevelopmentofAnther.Dev elopment of male gametophyte.Types of ovules.Nucellus.
DevelopmentofFemalegametophyte:Monosporic(*Polygonum*).

UNIT- V

10 hrs

Abriefaccountonpollination,Fertilization,DoublefertilizationandTriplefusion. Endosperm: Nuclear, Cellular, Helobial and Ruminant.
Endospermhaustoria.
DevelopmentofEmbryo in Dicot(*Capsella-bursapastoris*).Polyembryony.

PRACTICALS

ANATOMY OF ANGIOSPERMS

1. Study of simple and complex tissues by using permanent slides.
2. Study of primary structure and sectioning of Dicot stem, root, leaf, Monocot stem, root and leaf.
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 Gramineous. (Peel out From leaf).

EMBRYOLOGY OF ANGIOSPERMS

1. Structure of Anther (Young and Mature from *Datura* or *Cassia* flower)
2. Types of ovules: Anotropous, Orthotropous, Circinotropous, Amphitropous, Campylotropous. (Permanent slides).
3. Stages in Microsporogenesis and Megasporogenesis (Permanent slides on 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) Ruminant (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, Arnold Pub. 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-Part I Cells and Tissues* – Edward Arnold London.

EMBRYOLOGY

Text Books

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

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

5th Edition, Vikas Publishing House, Delhi.

Pandey, A.K. (2000). Introduction to Embryology of Angiosperms. 1st Edition: CBS; New Delhi.

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

References

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

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

SEMESTER-IV
NON -MAJOR ELECTIVE -II SUBJECTCODE:21UBON02
HERBAL BOTANY

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

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

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

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

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

Textbooks

John Jothi Prakash, E. (2003). Medicinal Botany and Pharmacognosy. JPR Pub, Vallioor, Tirunelveli.
Gokhale SB, Kokate CK & Purohit AP (1995). Pharmacognosy. Nirali Prakashan, 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 and Chopra IC (1956). Glossary of Indian medicinal plants. CSIR, New Delhi.

References

Kanny,Lall,DeyandRajBahadur,(1984).TheindigenousofIndia,International Book Distributors.

SivarajanVVandBalachandranIndra(1994).Ayurvedicdrugsandtheirplantsource.

PERIYARUNIVERSITY,SALEM-636011

B.Sc.,BOTANY

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

SEMESTER-V

CORE COURSE – VII SUBJECT CODE:21UBO05
MORPHOLOGYANDTAXONOMYOFANGIOSPERMS

UNIT I

10 hrs

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

UNIT II

15hrs

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

UNIT III

15hrs

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

UNIT IV

20 hrs

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

UNIT V

20 hrs

Detailed study of families: Study the following families of Bentham and Hooker, s System
w.s.r.t. their morphological and floral characters. Special attention should be given to
common and economically important plants within the families: Apocyanaceae,
Asclepiadaceae, Verbenaceae, Lamiaceae, Euphorbiaceae, Orchidaceae, Liliaceae,
Poaceae.

PRACTICAL 3hrs/Week

1. Describe the plant parts with suitable plants- Technical term habit, habitat form... types

of leaves, with leaf shape, margin, texture, modification of leaf.

2. Study the Types and modification of root and stem with suitable example

Identify the following inflorescence and fruits:

(a) Inflorescence-Simpleraceme, 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 Flowering 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. 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 & Boyd. Gangulee HC Das KS and Datta CT (1964). College Botany – Vol I, Basant

Panchami, Calcutta.

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

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

HillAF1982.EconomicBotany.:McGrawHill, NewYork.

1JainSKandRaoRR(1976).Ahandbookoffieldandherbariumtechnique.Today andtomorrow,,s
Publishers, New Delhi.

JefferyC(1968).AnIntroductiontoPlantTaxonomy,JandAChurchill.London.

SEMESTER-V

CORECOURSE-VIIISUBJECTCODE21UBO06 CELL
BIOLOGY

CYTOLOGY

UNIT I

15hrs

HistoryandDevelopmentofcellbiology.

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;

Characteristicsofprokaryoticand eukaryoticcells

UnitII

15hrs

UltrastructureofaPlantcell.

CellwallChemistry,structureandfunctionofPlantcell wall.

Plasma membrane. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis

UnitIII

15hrs

Endomembrane system: Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing;

SmoothERandlipidsynthesis, exportofproteinsand lipids;

GolgiApparatus–organization,proteinglycosylation,proteinortingandexportfrom Golgi Apparatus;

Ribosome; Lysosomes

Cellular inclusions- Starch grains, Aleurone grains,Inulin Crystals, Raphides and Cystoliths.

Unit IV15 hrs

Cellorganelles

Nucleus:Structure-nuclearenvelope,nuclearporecomplex,nuclearlamina,molecular organization of chromatin; nucleolus.

Chloroplastandmitochondria:Structuralorganization;Function;

Semi-autonomous nature of mitochondria and chloroplast.

UNITV

15hrs

Chromosomes–Morphology,StructureofPolytene,LampbrushandB-chromosomes.Nucleic acid –Structure and types of DNA and RNA, Nucleosomes.Replication-DNA.RNA

Structure and types.Cell division– Amitosis, mitosis and meiosis.

Generegulation–Lacoperon.

PRACTICAL3hrs/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 (Hydrilla leaf)
4. Starch grains (potato), Aleurone grains (wheat), Inulin Crystals (potato), Raphides (Petiole – Colocasia/Nymphaea) and Cystoliths – (leaf peel out - Ficus/Momordica).
5. Study the polytene and lampbrush 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 McGraw-Hill, New Delhi.
Sundararajan, S (2000). Cytology. Anmol publication (P) Ltd, New Delhi.

References

Dyansager, V.R (1986). Cytology and Genetics. Tata McGraw-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

SEMESTER-V

CORECOURSEIXSUBJECTCODE:21UBO07

GENETICS and PLANT BREEDING

GENETICS

UNIT I

15hrs

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

15hrs

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

15hrs

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

15hrs

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

15 hrs.

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

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

References

Lewin(2007).GeneIX.JonesandBarlettPub.ISBN.O763752223 Brown,
T.A.(2006). Genomes 3, Garland science, New York.
Gupta, PK.(2002).Genetics. Rastogi publishers, Meerut.
MeyyanRP(2000)genetics,SarasPublication,Nagercoil.
Strickberger,M.W(1999).Genetics.PrenticeHalofIndiaPvtLtd.,NewDelhi.Sing
h.B.D (2000).Fundamentals of Genetics.Kalyani Publishers, NewDelhi.Mirta,
S (1994).Genetics- A Blue print of life. Tata McGraw Hill,New Delhi.

PLANTBREEDING

TextBooks

Chauduri,HK.(1971).ElementaryPrinciplesofPlantBreeding,OxfordandIBHCo., New
Delhi.
SinghBD(2002).PlantBreeding.Kalyani Publishers,Ludhiana.
GuptaSK(2010).PracticalPlantBreeding.Seconded.,Agrobios(India)Jodhpur. Allard
RW (1960). Principles of Plant Breeding.John Willeyand Sons, Inc.

PERIYARUNIVERSITY,SALEM-636011

B.Sc.,BOTANY

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

SEMESTER-V

MAJORELECTIVECOURSEI-SUBJECTCODE:21UBOE01

PLANT AND ENVIRONMENTAL BIOTECHNOLOGY

UNIT I

15hrs

Biotechnology – History, scope and significance.

Recombinant DNA technology. Role of Restriction enzymes.

Cloning vectors – Plasmid, Cosmids, Bacteriophages. Transposons. Applications of Genetic Engineering.

UNIT II

15hrs

Gene transfer in plants - Aims, strategies for development of transgenic plants.

Direct gene transfer methods - Electroporation, Lipofection and Microinjection.

Indirect gene transfer – *Agrobacterium* mediated gene transfer.

Advantages and disadvantages of transgenic plant

UNIT III

15hrs

Techniques and application of biotechnology – Polymerase chain reaction: Principle and Application of PCR and RT-PCR.

– DNA Sequencing – Sanger's method.

Introduction and application of molecular markers – brief account DNA fingerprinting and Bar coding of plants.

UNIT IV

15hrs

Genes of agronomic interest and transgenic crops: Golden rice, Bt cotton and Bt brinjal. Disease resistance.

Biosafety and bioethics of transgenic

plants. Enhancement of shelf life of flowers and fruits.

UNIT V

15 hrs

Environmental Biotechnology: Biodiversity and conservation.

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. 1st 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.

References

BrownTA(2006).GenecloningandDNAanalysis.Blackwellscientificpublishers
PrimeroseSB, Twyman RM &old RW (2001).Principleof genemanipulation; an
Introductiontogeneticengineering.6thEdBlackwelloxford.

PU-B.Sc.,Botany(College),2021-2122Credit/2hr/Week/30hr/VSEM

SEMESTER-V

SKILLBASEDELECTIVECOURSE-IVSUBJECTCODE:21UBOS04

AGRICULTURALMICROBIOLOGY

UNITI

6hrs

Generalcharacterization-Soilmicroflora-Bacteria,Fungi,Actinomycetes,Algaeand Phosphate solubilizing bacteria.

Rhizosphereandnonrhizosphereconcept.

RoleofRhizospheremicroorganisms insoilfertility.

UNITII

6hrs

Nitrogencycleinnature-

biologicalN₂fixation.Symbioticand non-symbiotic bacteria.

*Rhizobium*and*Azospirillum*-Isolation,MassProductionandFieldapplication.

UNITIII

6hrs

Azotobacter-Isolation,MassproductionandFieldapplication.

Cyanobacteria(bluegreenalgae),*Azolla*and*Anabaenaazollae*association,nitrogen fixation, factors affecting growth, Blue green algae and *Azolla*in rice cultivation.

UNITIV

6hrs

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

UNITV

6hrs

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

References

Dubey,RC(2005).TextbookofBiotechnologyS.Chand&Co,NewDelhi.

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

JohnJothiPrakash,E(2004).OutlinesofPlantBiotechnology.EmkayPublication,New Delhi.

Sathe,TV(2004).VermicultureandOrganic Farming.Daya publishers.

Subha Rao, NS (2000). Soil Microbiology, Oxford & IBH Publishers, New Delhi.

Vayas,SC,Vayas,S.andModi,HA(1998).Bio-fertilizersandorganicFarmingAkta

Prakashan, Nadiad.

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

SEMESTER V

SKILLBASEDELECTIVECOURSE-VSUBJECTCODE:21UBOS05

BIOLOGICAL TECHNIQUES AND COMPUTER APPLICATION

UNIT I

6hrs

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

6hrs

Microtechnique-preparationformicroscopicobservation-Wholemound,Smears, Squash, sections.

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

Microtome's-Types-PrinciplesandoperatingmechanismsofRotaryMicrotome.

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

UNIT III

6hrs

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

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

PrincipleandApplicationofpHmeter,ColorimetryandSpectrophotometer.

UNIT IV

6hrs

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

UNIT V

6hrs

ComputerapplicationintheArtofScientificPresentation-Numbers,units,abbreviations and nomenclature used in scientific writing.Writing references.

Microsoftwordforassignmentandprojectwrok.

Microsoft excel for tabular and graph work.

MicrosoftPowerPointPresentationforpreparingslides Poster presentation.

TextBooks

PatkiL.R,BhalchandraB.L,JeevajiI.H.(1987).AnintroductiontoMicrotechnique, 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.

PalaniveluP(2013).AnalyticalBiochemistryandSeparationtechniques,20thcentury publications ,Palkalainage, Madurai.

Khan,I.A.,andKhannum,A.,(1994).FundamentalsofBiostatistics,VikasPub., Hyderabad

SundarRaoP.S.SandRichardJ(2011)introductiontoBiostatisticsandresearch methods ,
PHIlearning private Ltd , New Delhi.
DepartmentofFoundationCourse,“ComputerLiteracy”,St.Joseph’sCollege,2017.

References

Johansen,DA(1940).PlantMicrotechnique,TATAMcGrawHillBookCo.,Ins.,New Delhi.
PeterGray(1964).Hand bookofBasicMicrotechnique.McGrawHillPub,NewYork. Steven
Ruzin (2005).Plant Microtechnique and Microscopy. Oxford University
Press,London.
Cooper.TG (1991).The Tools of Bio-chemistry, John Wiley &sons, London.
DeyP.M.andHarborne,JB(2000).PlantBiochemistryHarcourtAsiaPvt.Ltd.
PlummerDT (2003).An introduction to practical Biochemistry.3rd Edn. Tata
McGrawHill PublishingCompanyLtd.NewDelhi.
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/VISEM

SEMESTER-VI
CORE COURSE – XI SUBJECTCODE:21UBO08
PLANT PHYSIOLOGY

UNITI

15hrs

Plant water relations- Diffusion, imbibition, osmosis, OP, DPD, TP, WP.
AbsorptionofwaterandMineral–
Activeabsorptionandpassiveabsorption.Ascent of sap.
Transpiration–types,mechanismofstomatalmovement.
Factors affecting transpiration.Guttation.
Roleofmacroand microelements.

UNITII

15hrs

Photosynthesis- Photosynthetic pigments -Concept of photosynthetic unit – Emerson s enhancement effect – Stages of photosynthesis – light reactions – cyclic and non-cyclic photophosphorylation.Calvincycle.C4andCAMpathway.Photorespiration(Briefstudy only).Factors affecting photosynthesis.

UNITIII

15hrs

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

UNITIV

15hrs

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

UNITV

15Hrs

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

PRACTICAL3Hrs/Week

1. DeterminationofDPDbyusingRheo leaf/Onion leaf
2. EffectoftemperatureonMembranepermeability
3. EffectofchemicalonMembranepermeability
4. Calculationofstomatalindexandstomatalfrequencyofamesophyteanda Xerophyte
5. EffectoflightontranspirationusingGanong’sspotometer
6. Separationofplant pigments bypaper chromatography.
7. To studytheeffectof light intensityonPhotosynthesisbyusingWilmottsbubbler
8. TostudytheeffectofandconcentrationofCO₂onPhotosynthesisbyusing Wilmott’s bubbler

9. Measurement of rate of respiration in germinating seed using Simple Respiroscope
10. Measurement of rate of respiration in flower buds using Simple Respiroscope

Text Books

Pandey, S N and Sinha, B K (2001). Plant Physiology. Third revised edition, Vikas publishing House Pvt. Ltd, New Delhi

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

Noggle, G R. and Fritz, G J (1976). Introductory Plant Physiology, Prentice -Hall, India. Jain, V K (2007). Fundamentals of plant physiology, S. Chand & Company Ltd, New Delhi.

Nobel, P S (1970). Introduction to Biophysical Plant Physiology. W. H. Freeman and Company, San Francisco

Verma, V (2008). Textbook of plant Physiology, Ane'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, C M (1983). Nitrogen Metabolism in Plants. Longman.

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

Salisbury, F B and Ross, C W (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, Land Zeiger, E (1991). Plant physiology. The Benjamin/Cummings Publishing company, Inc., California, New York.

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

SEMESTER-VI

CORE COURSE – XII SUBJECTCODE:21UB009

PLANT ECOLOGY AND PLANT GEOGRAPHY

UNIT I

15hrs

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

UNIT II

15hrs

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

15hrs

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

15hrs

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

15hrs

Definition,Concept,Scope and significance of phytogeography.
Phytogeographical zones of India.
Vegetational types in Tamilnadu.
Hotspots–Endemic distribution, Age and Area Hypothesis.
Continental drift theory.Conservation – *In situ* 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 dioxide in water.

TextBooks

- Sharma,P.D(2009).EcologyandEnvironment.RastogiPublications.
Shukla, R.S. &P.S. Chandel (1991) : Plant Ecology & Soil Science. S.Chand & Co.,
New Delhi
Vasishta,P.C,1979PlantEcology.VishalPublication.
Verma,V,A1981TextBookofplantEcology.EmkayPublication.
Sharma,J.P.2004EnvironmentalStudies.LaxmiPublications(P)Ltd.NewDelhi.

References

- Ambasht RS (1978).The Book of Plant Ecology. Students friends Co.
Willings WD (1964).Plants and Ecosystem. Wasworti Publishing Co.
Daubemire RF (1973).Plant and Environment. John Willey.
GopalBandBhardwaj(1979).ElementsofEcology.VikasPub.HousePvt.Ltd. Cain
SA (1944). Foundationsof Plant Geography.Harper & Brothers, N.Y.
ManiMS(1974).Ecology&Biogeography ofIndia. Dr.W.JunkPublishers, The
Haque
Good,R.(1997).TheGeographyoffloweringPlants(2ndEdn.)Longmans,
Green&Co.,Inc., London&AlliedSciencePublishers,NewDelhi-495pp.,

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

SEMESTER-VI

CORE COURSE -XIII SUBJECT

CODE:21UBO10

PLANT PROTECTION

UNIT I **15 hrs**

Types of insects causing damage to crop. Nature and classification of plant nematodes. Damages to crops of India by Insects, Nematodes, Rodents, Fungi, Bacteria and viruses - a general outline.

UNIT II **15hrs**

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 **15hrs**

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 **15hrs**

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 **15hrs**

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 text book 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

Delhi.

Rangaswami,G(1999).DiseaseofCropplantsof India.PrenticeHallofIndiaPvt.Ltd. Sharma
PD(2004). Plant Pathology.Rastogi Publishers.

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B.Sc.,BOTANY

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

SEMESTER-VI

MAJORELECTIVECOURSE-IISUBJECTCODE: 21UBOE02

BIOCHEMISTRY

UNIT I

15hrs

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

UNIT II

15hrs

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

UNIT III

15hrs

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- tertiary structure -quaternary structure-function of protein

UNIT IV

15hrs

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

UNIT V

15hrs

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

Text Books

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

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

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

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

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

References

Appel *et al.*, (1992). Biochemistry. ELBS.

Caret *et al.*, (1993). Inorganic, Organic and Biological Chemistry, W.M.C. 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/30hrs/SEM

SEMESTER-VI

SKILLBASEDELECTIVECOURSES-VIIISUBJECTCODE:21UBOS07 SEED TECHNOLOGY

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

UNITII **6hrs**
Seed sampling – Method of sampling – Seed Purity – Seed Germination – Methods of Seed Germination using paper, Sand or soil – Standard Germination Test.Seed dormancy.

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

UNITIV **6hrs**
Certifiedseedproductionofthefollowing:Paddy, groundnutandcotton.

UNITV **6hrs**
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.,
BewleyJ.D.andBlackM(Edn)1985–SeedPhysiologyofdevelopmentand germination. Plenum Press, New York.
Kowlsowsky.SeedBiology.Vol.I,Vol.IIandVol.III.AcademicPress,NewYork.

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

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

UNIT I **12 hrs**

Thallophytes: Algae: general characters.Studyofthestructureand lifecycleofthe following genera-*Oscillatoria*, *Oedogonium*, *Sargassum* and *Polysiphonia*.

Fungi:GeneralCharacters.Study ofthestructureandlifecycleofthefollowinggenera *Albugo*,*Penicillium*and*Agaricus*.Economicimportanceoffungi

UNIT II **12hrs**

A general study of Bacteria and viruses.Economic importance of bacteria.

Bryophytes:GeneralCharacters.Studyofthestructureandlifecycleof*Marchantia*.

UNIT III **12hrs**

PteridophytesandGymnosperms: Structureandlifecycleof*Lycopodium*and*Cycas*.

UNIT IV **12 hrs**

PlantPhysiology:Osmosis,absorptionofwater.Photosynthesis-Lightreaction,Calvincycle. Transpiration– types, mechanism of stomatal movement.

Nitrogen cycle.

Hormones(Auxinonly).

UNIT V **12 hrs**

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

Textbooks

FullerHJandTrippoO.(1949).CollegeBotany,HenryHolt&Co.

GangulyAK(1975)General BotanyVolI(1971)&Vol II,TheNewBook Stall, Calcutta.

Rao,K..Krishnamurthy, KVandRaoGS(1979).AncillaryBotany,S.ViswanathanPvt. Ltd., Madras.

Palaniappan,S.(1985).ThavaraviyalThunaippadam(Tamil),MohanPadippagam, Chennai.

PandeyBP(1986).TextBookofBotany(CollegeBotany)Vol Iand II,S.ChandandCo. New Delhi.

RasoolSKandSekarT(2002).AlliedBotany,PopularBookHouse,Chennai-15.

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

ALLIEDBOTANY

FIRSTALLIEDCOURSE-IISUBJECTCODE:21UBOA02

**EXTERNALMORPHOLOGY,TAXONOMYOFANGIOSPERMS,CYTOLOGY, GENETICS,
ANATOMY AND EMBRYOLOGY.**

UNITI

12hrs

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.

UNITII

12hrs

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

UNITIII

12hrs

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.

UNITIV

12hrs

Anatomy: Meristem. Simple permanent tissues - Parenchyma, Collenchyma, Sclerenchyma.Complex permanent tissues - Xylem and Pholem.
PrimarystructureofDicotstem,DicotrootandDicotLeaf.(Mesophyticonly)

UNITV

12hrs

Embryology - Structure and development of anther, male gametophyte. Structure and development of ovule and female gametophyte (Polygonumtype).Fertilization.Structure and development of dicot embryo (*Capsella* type).

PRACTICAL

1. To describe in technical terms plants belonging to anyof 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. *Arachishypogea*-Groundnut
 2. *Dolichosbiflorus*-Horsegram
 3. *Cicerarietinum*-Bengalgram

4. *Pisumsativum* -Pea
 5. *Phaseolusmungo*– Blackgram
 6. *Phaseolusradiatus*–Greengram
 7. *Tamarindusindica* -Fruit
 8. *Abrusprecatorius* -Seed
 9. *Acaciaconcinna*– Soapnut
 10. *Luffaaegyptiaca*-Fibrousskeletonofthefruit
 11. *Cucumissativus* -Fruit
 12. *Coffeaarabica* -Seeds
 13. *Ixora*-Flower
 14. *Cinchonaofficinalis*-Plant
 15. *MusaParadisica* – Fruit
 16. *Phoenixsylvestris*-Datefruit
 17. *Areacatechu*-Nut
 18. *Cocosnucifera*-Kernal
3. TomakesuitableMicropreparations,describeandidentifymaterialsofAlgae,Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms prescribed.
4. Todescribessimpleexperimental set-upinplantphysiologysectionofthesyllabus.

Textbooks

- FullerHJandTippoO.(1949).CollegeBotany,HenryHolt&Co.
GangulyAK(1975)General BotanyVolI(1971)&Vol II,TheNewBook Stall, Calcutta.
Rao,K..Krishnamurthy, KVandRaoGS(1979)AncillaryBotany,S.ViswanathanPvt. Ltd., Madras.
Palaniappan,S.(1985).ThavaraviyalThunaippadam(Tamil)Vol IandII,Mohan Padippagam, Chennai.
PandeyB.P,1986,TextBookofBotany(CollegeBotany)Vol Iand II,S.ChandandCo. New Delhi.
RasoolSKandSekarT(2002).AlliedBotany,PopularBookHouse,Chennai-15.

B.Sc.,BOTANYMAJORANDALLIEDBOTANYTHEORYQUESTION

PAPERMODEL.

B.Sc., Degree Examination, APRIL / NOVEMBER 20___

Time: 3 hrs.

Max. Marks: 75

Part - A: (15 x 1 = 15 marks)

**Answer allthe questions. Choose
the correct answer**

(Threequestionsfromeachunit)

Q.No. 1- Q.No. 15

Part – B (2x5 = 10 marks)

AnsweranyTWOquestions

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=50marks) Answer

all the questions.

AllQuestioncarryequalmarks.Eachanswershouldnotexceed500words.

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.,BotanyDegreeExamination

((ForStudentsAdmittedfromtheAcademicYear2021-2022onwardsunderCBCS Pattern)

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

Time: 3hrs.

Maximum: 60 Marks

Practical: 50 Marks

Record : 10 Marks

1. Cut transverse section of A, B and C. Stain and mount in glycerin. Identify giving reason. Draw diagrams. Leave the slides for valuation. (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. (Diagrams not Necessary) 3X3=9
4. Identify and write notes on economic importance of K, L, and M. 2X2=4

Key

A-Algae

B-Fungi

C-Bryophytes

(Preparation-2, Identification-1, Diagram-2, Reason-2)

(7X3=21)

D-Algae-slide

E-Fungi-slide

F-Bryophyte-slide

G-Lichens-fruit body Bacteria/Viruses-electron micrograph

(Identification -1, Diagram -1 , Reason -2)

(4X4=16)

H -Algae

I-Fungi

J-Bryophytes

(Genus 1, Group 1, Morphology 1)

(3X3=9)

K-Algae/Fungi

L-Bacteria/Viruses

(identification 1, importance 1)

(2X2=4)

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

MODELQUESTION PAPER

B.Sc.,BotanyDegreeExamination

((ForStudentsAdmittedfromtheAcademicYear2021-2022onwardsunderCBCS Pattern)

CORECOURSE-V.SUBJECTCODE:21UBOP02

MAJOR PRACTICAL II

(CoveringthecorecoursesIV&VI)

(PTERIDOPHYTES,GYMNOSPERMSANDPALEOBOTANY;ANATOMY&EMBRYOLOGY OF ANGIOSPERM)

Time:3hrs.

Maximum:60Marks

Practical:50Marks

Record : 10 Marks

1. CuttransversesectionsofA,BandC.Stainandmount inglycerin.Identifygiving Reasons.Drawdiagrams.Leavetheslidesforvaluation. (4X6=24marks)
2. Make a suitable micro preparation of D. Identify giving reasons. Draw diagrams. Leave the Slides for valuation. (6 marks)
3. Dissectandmount anyoneofthestagesofthe givenmaterialE. (Diagram andnotesnotnecessary) (4Marks)
4. Namethe genus,groupand morphologyof givenpartofFand G. (2X3=6marks)
5. WritenotesonH,I,J,K andL . (5X2=10marks)

KEY

- A. Angiosperm-Anatomy- Vegetativepart.
- B. Pteridophyte-Anatomy-Vegetativepart.
- C. Gymnosperm-Anatomy-Vegetativepart.

(Preparation2,Identification 1,Diagram1,Reason2)

D. Reproductivepart-Pteridophyte(or)Gymnosperm.

(Preparation2,Identification 1,Diagram1,Reason2)

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) (Identification1,Reason1)(5X2=10)

PERIYARUNIVERSITY,SALEM-636011

B.Sc.,BOTANY

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

MODELQUESTION PAPER

B.Sc.,BotanyDegreeExamination

((ForStudentsAdmittedfromtheAcademicYear2021-2022onwardsunderCBCS Pattern))

CORECOURSE-XIV.SUBJECTCODE:21UBOP03

MAJOR PRACTICAL III

(Covering the core courses VII ,VIII&IX)

**MORPHOLOGYANDTAXONOMYOFANGIOSPERMS,
CELL BIOLOGY, GENETICS, AND PLANT BREEDING)**

Time:3hrs.

Maximum:60Marks

Practical:45Marks

Record:10Marks

Herbarium:5Marks

1. Refer A and B, to their respective families. Point out the characters on which the identification is based at each level. (Diagrams not necessary) (2X4=8 Marks)
 2. Make acetocarmine preparation of C (Squash) at any one stage. draw diagram. 4 Marks
 3. Describe D in Technical terms. Draw diagrams of the floral parts only. Construct the floral Diagram. Give the floral formula 5Marks
 4. Construct the chromosome map with the data provided E 5Marks
 5. Solve the given genetic problem F and G (2X4=8Marks)
 6. Spot at sight H and I (2X2=4Marks)
 7. Write the name of the genus, species, family and morphology of the useful parts of J and K -(4X2=8Marks)
 8. Briefly describe the plant breeding technique in spotter L 3Marks
- Key**
- A & B - Family -2X4=8marks
- C - Onion root tip - preparation =3marks, diagram -1 marks -4marks
- D - Plant with flowers - preparation -1marks, Floral diagram -2marks, Floral formula -2marks -5 marks
- E - Chromosome map -5 marks
- F & G - Genetic problems -2X3= 8marks
- H & I - Cytology spotter - Identification -1marks, Reason -1 2X2=4marks
- J & K - Morphological parts - Genus -1mark, Species -1 marks, family -1mark, Morphology -1 mark
- L - Any Plant breeding technique -3marks

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-XV. SUBJECT CODE: 21UBOP04

MAJOR PRACTICAL IV

(Covering the core courses XI, XII & XIII)

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

Time: 3hrs.

Maximum: 60 Marks

Practical: 50 Marks

Record: 10 Marks.

1. Outline the procedure, apparatus and materials required for investigating the physiological Problem A, assigned. Set up the experiment. Tabulate the data obtained and report the Results. Leave the set up for valuation. (16 marks)
2. Based on morphological and anatomical characters, assign, B and C to their respective probable habitats. Draw suitable diagrams. Submit slides for valuation. 2X8=16
3. Identify the causal organism of the diseased material „D“. and “ E“. Draw diagrams. Describe the symptoms and list the control measures. (2X8=16)
4. Comment on „F“ 2 Marks

Key

A-Physiology-Materials-2marks, Procedure-4, Setup-4marks, Spot Viva-strictly pertained to the concerned physiology experiment- 2 marks-Result - 4marks

B&C Ecology material -preparation-2marks, identification-1 mark, Diagram-2reason-3marks

D,E,- Any disease in the syllabus -Named disease-1marks, Causative organism -1marks, Symptom-2 Control measure - 2 marks, diagram -2marks)

G-Plant protection appliances-2marks

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

MODELQUESTION PAPER

(ForStudentsAdmittedfromtheAcademicYear2021-2022onwardsunderCBCSPattern)

B.Sc.,BOTANYALLIEDPRACTICAL

SUBJECTCODE: 21UBOAP01

Time:3 hrs.

Maximum:60Marks

Practical:50Marks

Record : 10 Marks

1. ReferA&Btotheirfamiliesgivingreasons(Diagramsnotnecessary)10Mark
2. Identifytheplant, familyand morphologyof theparts usedforC, D,E,F and G.15mark
3. CuttransversesectionofH&I.StainandmountinGlycerin.Identify givingreasons. Draw diagrams. Submit theslidesforvaluation.10 mark
4. WritecriticalnotesonJ,K,L,M,N,O.Drawdiagrams. 12 mark
5. physiologyExperimentP 3 mark

KEY

1.ForAandB-Any2 plantsprescribed in thesyllabus.

Reasons3,Identification-2

2 x5=10 mark

2ForC, D,E, FandG - any5 specimengiveninthepracticalsyllabus.

5X3=15Mark

4.ForHandI-Slide-2Identification -1Reasons- 2

2 x5=10 mark

4.Notes1,Diagram 1forJ,K,L,M,N,O

2 x6 =12 mark

5.PhysiologyExperiment P

3 Mark

