PERIYAR UNIVERSITY

PERIYAR PALKALAI
NAGARSALEM–636011

DEGREEOFBACHELOROFSCIENCE

CHOICEBASEDCREDITSYSTEM

Syllabusfor

B.SC.BOTANY

(SEMESTERPATTERN)

(For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards)

DEFINITION

PROGRAMME:

"Programme"meanscoredegreesofferedinvariousdisciplines.

COURSE:

"Course"referstothecoursesofferedunderthedegreeprogrammespread overthecomplete Programme of study as under.

Part I - RefersFoundation"Tamil/otherlanguages"offeredundertheprogramme.

PartII - RefersFoundation"CommunicativeEnglish"offeredundertheprogramme.

Part III - Refers "the core subjects" related to the programme concerned including Practicals.

Part III Allied - Refers"Alliedsubjects"offeredasallied,whichisinterdisciplinary in nature but related tothe programme.

Part III Electives - Includes"Core/Electivesubjects"relatedtothecoresubjectsofthe programme concerned.

PartIV (i) - "Non-MajorElectives"meansoptionisbeinggiventostudentswho donot come under the above two categories (i & ii).

(ii) - Skillbasedsubjectmeansthecoursesofferedundertheprogramme related to Advanced Skill acquisition for industrial application for which a separate Diploma will be awarded along with the Degree.

(iv) - "FoundationCourse"meanscoursesoffered as

1) EnvironmentalStudies(1st year)
2) ValueEducation-Yoga(1st year)
3) ProfessionalEnglishforLifescience
4) Nanmudhalvancourselikeofficefundamentalsandmedicalcodingto enhance employability

PartV -

"ExtensionActivities"meansallthoseactivitieswhich form part of NSS/NCC/Sports/YRC and other co and extracurricular activities.

Adetailedexplanationoftheabovewithrelevant creditsaregivenunder "SchemeofExamination alongwith DistributionofMarks and Credits"

DurationoftheCourse:

Currently for the undergraduate programme the duration of study is THREE years. The course of the degree of Bachelor of Science shall consist three academicyearsdividedintosixsemesters.Practicalexaminationswillbeatthe endofeven semesters.Theseregulations applyto theregularcourseofstudyin approved institutions of the University.

Credits:

Meanstheweightagegiventoeach courseofstudy(subjects)attributedbythe experts of the Boardof Studies concerned.

CreditSystem:

Means, the course of studyunder 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 thecreditsearned bythe students. The following are the total credit points:

ForUndergraduateProgramme(Threeyears) : 148

AIMANDSCOPEOFTHE COURSE:

1. Toacquireknowledgeindifferentareasofplantscience.
2. Thetopicsincludedindifferentunitsofdifferentpaperswouldenablethestudents todeveloptechnicalskillsinBasicBotanyanditsappliedbranches.
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 oftheabovecoursesalsoprovidesfoundationforenterprenership.
5. Practicals included in the syllabus will improve the skills of the students in Microscopictechniques,Observations,DrawingandPhysiologicalandEcologicalLab oratorytechniques.

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 withChemistry under higher secondary board of examination Stream) conducted by the Government of Tamil Nadu or an Examination accepted by theSyndicate, Subject to such conditions may be prescribed therefore shall be permitted to appear and qualify for B.Sc. degree examination in Botany.

DURATIONOFTHECOURSE:

TheCourseforthedegreeofBachelorofScienceshallconsistofthreeacademic yearsdividedinto six semesters. Each semester consists of 90 working days.

PASSINGMINIMUM:

Thecandidateshallbedeclaredtohavepassedtheexaminationsifhe/shesecuresnotlessthan40 marks.

DISTRIBUTIONOFMARKS:

THEORY

Universityexamination = 75marks
Internalassessment =25marks

INTERNAL ASSESSMENTSTRUCTURE:

Test	=15marks
Assignments	=05marks
Attendance	=05marks
PassingminimumforInternalAssessment	=10marks
PassingminimumofUniversityexaminations	=30marks

PRACTICALS

UniversityExaminations	=60marks
InternalAssessment	=40marks

INTERNALASSESSMENTSTRUCTURE:

Submission-10MarksTest-10MarksAttendance-5MarksTotal-40Marks

Submission	= 10 marks
Test	=10marks
RegularityinPractical	=10marks
Continues assessment	=10Marks

Passing minimum for internal assessment = 10 marks

Passingminimum forUniversityexaminations=30 marks

CLASSIFICATIONOFSUCCESSFULCANDIDATES:

- Candidateswhosecurenotlessthan60%oftheaggregatemarksinthewholeexaminationsshallbe declaredtohavepassedtheexaminationsinFirstclass.
- Candidateswhosecureabove50%andbelow60%shallbedeclaredtohavepassedtheexaminationsin Secondclass.
- Othersuccessful candidates whosecurebelow 50% shall be declared to have passed theexaminationinThirdclass.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

CourseStructure(CBCS)

B.ScBOTANYCOURSESTRUCTUREFROMTHEYEAR2021-2022ONWARDS

Sem	Part	Course	IntHrs	Credit	ExamHrs	Marks		
						CIA	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
	IIII	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	SecondAlliedpracticalI 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

	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	SecondAlliedPracticalI 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 Safety & Quality Management**	**2**	**2**	**3**	**25**	**75**	**100**
	IV	SBCEVII-SeedTechnology	2	2	3	25	75	100
	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

UNITI **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).

UNITII **15hrs**

A detailed study of Structure,Reproductionandlife cycle ofthe following algae genera:
Cyanophyceae:Oscillatoria,Anabaena,
Chlorophyceae:Chlamydomonas,VolvoxandOedogonium
Chlorophyceae:*Caulerpa, Chara,*

UNITIII **15hrs**

A detailed study of Structure,Reproductionandlife cycle ofthe following algae genera:
Xanthophyeae: Vaucheria
Bacillariphyceae:Cyclotella,
Phaeophyceae: Sargassum
Rhodophyceae: Gracilaria

BRYOPHYTES

UNITIV **15hrs**

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

AdetailedstudyoftheStructure,Reproductionandlifecyclesofthefollowing genera – *Marchantia*

UNITV **15hrs**

Adetailedstudy oftheStructure,Reproductionandlifecyclesofthefollowing genera *Porella, Anthoceros* and *Polytrichum*.

EvolutionofsporophytesofBryophytes.Economicimportanceof 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,KumaresanV&ArumugamN(2014).AlgaeandBryophytes.Saras Publication; I Edition, Nagercoil, Tamilnadu.
Kumar,HD(1999).IntroductoryPhycology.2nd edition.AffiliatedEast-WestPressPvt. Ltd.Delhi.
Pandey,BP(1994).Algae.S.Chand&CompanyLtd.NewDelhi.
Sharma, OP (2011). Algae. Tata McGraw Hill Education Private Ltd. New Delhi.
Vashishta, BR, Sinha AK, and Singh, VP (2011).BotanyforDegreeStudents-Algae. S. ChandPub.NewDelhi

References

Bold,HC&Wynne,MJ(1985).IntroductiontotheAlgae.PrenticeHallofIndia.New Delhi.
Chapman,VJ&Chapman DJ.TheAlgae.MacmillanPublication.NewYork.
Fritsch,FE(1945).StructureandreproductionofAlgae.CambridgeUniversity press. Cambridge, UK.
Lee,RD(2008).Phycology4th Edition,CambridgeUniversityPress,NewYork.Round, FE (1984).The Ecologyof Algae.Cambridge University Press.

BRYOPHYTES

TextBooks

Parihar,NS(1991).AnintroductiontoEmbryophyta.Vol.I.Bryophyta.Central Book Depot, Allahabad.
Sharma,OP(2013).Bryophytes.McGrawHilleducation(India)Pvt.Ltd.NewDelhi. Vashishta, PC (1999). Bryophyta. S. Chand & Company, New Delhi.
Vashishta,&SinhaAK(2011).Bryophytes.S.Chand&CompanyLtd.NewDelhi.

References

Cavers, F (1971).The interrelationship of Bryophyta.Dawsons of Pall Mall, London
PremPuri (1981). Bryophytes:Morphology, Growth and differentiation.Atma Ramand Sons,NewDelhi.
Rashid,A(1998).AnIntroductiontoBryophyta.VikasPub.Ltd.NewDelhi.

Smith,AJE(1982).Bryophyta:Ecology.ChapmanandHall.London.
Watson, EV (1968). British Mosses and Liverworts. Hutchinson and Co., London.
Watson,EV(1970).StructureandlifeofBryophytes.HutchinsonandCo.,London.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

UNITI 12 hrs

Astudyofthegeneralcharacteristicsandmodeoflifeoffungi:Vegetativeorganization, nutrition, asexual reproduction, sexual reproduction,
HeterothallismandParasexuality.LifecyclesinFungi-Haplontic,Diplonticand haplodiplontic.Classification of fungi (C.J. Alexopoulos andMims, 1979).
Economicimportanceof Fungi.

UNITII 12hrs

Detailedstudyofoccurrence,Morphology,Reproduction, Lifecycle andEconomic importance of the following genera:

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

UNITIII 12 hrs

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

Teliomycetes: Puccinia,
Hymenomycertes;Polyporusand
Deuteromycetes: Cercospora

LICHENSANDVIRUSES

UNITIV 12 hrs

Lichens: General characteristics, Occurrence, Distribution, Classification, Reproduction and Economic importance of Lichens.
Detailedstudyof*Usnea*.
Viruses:GeneralcharactersofPlantviruses.
Generalstructurewith specialreferencetoviroidsandprions;
GeneralaccountofBacteriophages–Cyanophages,Mycophages.ReproductionofT4phage

BACTERIA

UNITV 12 hrs

Bacteria – Major characteristics, Occurrence, Distribution, Classification of Bacteria.
Morphologyof Bacterial cell – Ultra structure of Bacterial cell.
Modeofnutritioninbacteria–Photosyntheticandchemosynthetic.

GrowthandReproductioninBacteria.
Wall-less forms (mycoplasma)
Economic importance of bacteria.

PRACTICAL:3hrs /Week

1. Micro preparation and Detailed microscopic analysis of Vegetative and ReproductivePartsofthefollowingFungi-*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. Studyofviruses,viroidsandprionsusingelectron micrographs(photographs).
4. StudyofStructureofBacteriausingpermanentslides/photographs.
5. Economicimportanceof fungi: Yeast, antibiotic- Penicillin, Wood rotting- *Polyporus*, edible fungi: *Agaricus*.
6. Economicimportanceofbacteria: Lactobacillus

Fungi

TextBooks

Alexopoulus,CJ&Mims,CW(1979).IntroductoryMycology.WileyEasternltd.,New Delhi.
Dube,HC(1990).An IntroductionofFungi.VikasPublicationHouseLtd.NewDelhi. 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).TheFungi.RastogiPublications,Meerut.

References

Burnett,J.H.(1971).ThefundamentalsofMycology.ELBSPublication, London
Bessey,E.A(1979).MorphologyandTaxonomyoffungi.VikaspublishingHousePvt. Ltd.NewDelhi.
Mehrotra,RS&Aneja,KR(1990).AnIntroductiontoMycology.NewAgeInternational Pub. New Delhi.
Sundararajan,S(2004).Practicalmanualoffungi.AnmolPublicationsPvt.LtdNew Delhi.
Webster,J(1970).Introductiontofungi.Cambridge UniversityPress.London.

LICHENS

References

Dharani Dhar Awasthi (2000). A Handbook of Lichens.Vedams eBooks (P) Ltd. NewDelhi.
Hale, ME. (1983). The Biology of Lichens. Edward Arnold, London.
Muthukumar, S& Tarar, JL(2006).LichenFlora of CentralIndia. Eastern book Corporation.NewDelhi.
Nash,TH(1996).Lichen Biology.CambridgeUniversityPress,London.

BACTERIA

TextBooks

Pelzer,MJ,Chan,ECS andKrieg,NR.(1983).Microbiology.TataMaGrawHill

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.4th Ed.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.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMSETR-II

SKILLBASEDELECTIVECOURSE–I:SUBJECTCODE:21UBOS01

MUSHROOM TECHNOLOGY

UNITI **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*.

UNITII **3hrs**

Pureculture-preparationofmedium(PDAandOatmealagarmedium).Sterilization.
Preparationoftesttubeslantstostoremotherculture.Culturing of *Pleurotus* mycelium on Petri plates.
Preparationofmotherspawnsinsalinebottleandpolypropylenebagandtheir multiplication.

UNITIII **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, sugarcanetrash.
Factorsaffectingthemushroombedpreparation- Lowcosttechnology.

UNITIV **3hrs**

Storageandnutrition:Short-termstorage(Refrigeration-upto24hours)Longterm Storage (canning, pickels, pappads), drying, storage in salt solutions.
Nutrition-Proteins-aminoacids,mineralelementsnutrition-Carbohydrates,Crude fibre content - Vitamins.
Medicinalvaluesofmushrooms

UNITV **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).Foodand Nutrition. Bappco, TheBangalore Printingand PublishingCo. Ltd.,Bangalore.

Tewari, PankajKapoor,S.C.,(1988). Mushroomcultivation,MittalPublications.NewDelhi.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–III

CORE COURSE –IV, SUBJECTCODE:21UBO03

PLANT DIVERSITY- III

(PTERIDOPHYTES,GYMNOSPERMSANDPALEOBOTANY)

UNITI **10 hrs**

Pteridophytes: General characteristics
Classification (Reimers 1954).
Sporangialorganization–
Homospory,Heterosporyandseedhabit.Aposopory and Apogamy.
Stelarevolution.
EcologicalandeconomicimportanceofPteridophytes

UNITII **10 hrs**

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

UNITIII **10 hrs**

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

UNITIV **15 hrs**

Gymnosperms-General Characteristics,
Classification(Pilger and Melchior,1954).
Morphology,anatomyandreproductionof*Cycas*and*Pinus*.Eco
nomic importance.

UNITV **15hrs**

GymnospermandPaleobotany:
Detailed studyofthe *Gnetum*.
Paleobotany–Geologicaltimescale,Radiocarbondating
Fossilization process.
Briefstudyofthefollowingfossils:*Lepidodendron,Lepidocarpon,Calamites, Williamsonia.*

PRACTICAL3HRS/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.Chicagorepreinted 1950.NewYork.
Eames,A.J.(1936). Morphologyoflowervascular 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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER- III

NON–MAJORELECTIVECOURSE–ISUBJECTCODE:21UBON01

MUSHROOM CULTURE

UNITI **6hrs**

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

U**NITII** **6hrs**

Pureculture: PreparationofMedium(PotatodextroseandOatmealAgarmedium), Sterilization culturing of *Pleurotus* mycelium on test tube Slants, Petri plate. Preparationofmotherspawnsinsalinebottleandpolypropylenebag.
Substrate for spawn preparation (cereal grain, coir pith)

UNITIII **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.
Mushroombedpreparation-paddystraw,sugarcanetrash,maizestraw,bananaleaves.
Factors affecting the mushroom bed preparation - Low cost technology.

UNITIV **6hrs**

Storageandnutrition:Short-termstorage(Refrigeration-upto24hours)Longterm Storage (canning, pickels, pappads), drying, storage in salt solutions.
Nutrition-Proteins-aminoacids,mineralelementsnutrition-Carbohydrates,Crudefibre content – Vitamins

UNITV **6 hrs**

FoodPreparation:Typesoffoodspreparedfrommushroom.
Research Centre - National level and Regional level.
Costbenefitratio-MarketinginIndiaandabroad,ExportValue.

References

Marimuthu,T,Krishnamoorthy,AS,Sivaprakasam,K&JayarajanR(1991).Oyster Mushrooms. Department of Plant Pathology, TNAU, Coimbatore.
Swaminathan,M.(1990).Foodand Nutrition.Bappco. TheBangalorePrintingand Publishing Co. Ltd., Bangalore - 560018.
Tewari, &Pankaj Kapoor, SC (1988). Mushroom cultivation. Mittal Publications. New Delhi.
NitaBahl(2009).HandbookonMushrooms.Oxford&IBHPublishers.NewDelhi. Tripathi, DP (2005). Mushroom Cultivation.Oxford & IBH Publishers. New Delhi. Muthusamy, AD & Yesuraja, I(1999). Mushrooms Culture. TNAU Publishers New Delhi.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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,DiacyticandGraminaceous.
Groundtissuesandvasculartissues-types.Trichomes- Types.

UNIT– III **15hrs**

Primaryand secondarystructureofDicotStem andRoot.
Anomaloussecondarygrowthinstemsof*Nyctanthes,Boerhaavia,Dracaena*.
Anomalous secondary growth in roots of *Beta vulgaris*
Primarystructureofmonocotstemandroot.Structure of Dicot and Monocot leaf.
Nodalanatomy–Uni, triandmultilacunar node.

EMBRYOLOGYOFANGIOSPERMS

UNIT– IV **10hrs**

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

UNIT– V **10 hrs**

AbriefaccountonpollinationFertilization,DoublefertilizationandTriplefusion. Endosperm**:** Nuclear, Cellular, Helobial and Ruminate.
Endospermhaustoria.
DevelopmentofEmbryoinDicot(*Capsella-bursapastoris*).Polyembryony.

PRACTICALS

ANATOMYOFANGIOSPERMS

1. Studyofsimple andcomplextissues byusingpermanentslides.
2. Study of primary structure and sectioning ofDicotstem, root, leaf,Monocot stem, root and leaf.
3. Normalsecondarythickeningin Dicot stem androot.
4. Anomalous secondary structures –*Nyctanthes, Boerhaavia Dracaena and Beta vulgaris*. (Permanent slides)
5. Stomataltypes: Anomocytic,Anisocytic,Paracytic,DiacyticandGraminaceous. (Peel out Fromleaf).

EMBRYOLOGYOFANGIOSPERMS

1. StructureofAnther (Youngand Maturefrom*Datura*or*Cassia*flower)
2. Types of ovules: Anatropous, Orthotropous, Circinotropous, Amphitropous,Campylotropous.(Permanent slides).
3. StagesinMicrosporogesisandMegasporogensis(Permanentslidesonionflower Bud).
4. Structure of Male gametophyte and Female gametophyte (Permanent Slides/photographs).
5. DissectionofembryoandobservetheglobularandHeartshape
6. StructureofEndosperm.Nuclear(Coconutwater)cellularendosperm(Cucumber seed) Ruminate (fruit of *Arecha catechu*)

ANATOMY

TextBooks

PandeyB,P.,(2015)(Edn.)Plant AnatomyS.ChandPubl. New Delhi.

Pijushroy,(2010).PlantAnatomy,NewcentralBookAgency,Pvt.Ltd,NewDelhi.

VashistaP.C(1984).*PlantAnatomy*–Pradeeppublication,Jalandhar

References

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

Cutter,E.G.(1971).Plant Anatomy,EdwardArnoldPub.Ltd.,London.

Cutter,E.G.(1978).PlantAnatomy,ExperimentalandInterpretation.EdwardArnold Pub.Ltd., London.

Esau,K.(1960).PlantAnatomy,WileyEasternPrivateLtd., NewDelhi.

Esau,K.(1977).Anatomyofseedplants.WileyEasternPublication, NewDelhi. Fahn, A.(1989). Plant Anatomy.Macmillan Publication (P) Ltd, Singapore.

CoutlerE.G(1969)*PlantAnatomy-Part1CellsandTissues*–EdwardArnoldLondon.

EMBRYOLOGY

TextBooks

Bhatnagar,SP,Dantu,PKandBhojwani,SS.(2014).TheEmbryologyofAngiosperms 6thEditionVikas Publishing House. Delhi.

Bhojwani,SS.andBhatnagar,SP. (2011). TheEmbryologyof Angiosperms.

5th Edition,VikasPublishingHouse.Delhi.
Pandey, AK. (2000). Introductionto EmbryologyofAngiosperms. 1st Edition: CBS; New Delhi.
Maheswari,P.(1976).AnintroductiontotheEmbryologyofAngiosperms.TATA McGraw-Hill Publishing Co., Ltd., New Delhi.

References

Johri,BMl(1984).EmbryologyofAngiosperms.Springer-Verlag.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–IV

NON –MAJOR ELECTIVE –II

SUBJECTCODE:21UBON02

HERBAL BOTANY

UNITI **6hrs**

Herbalmedicines:Historyandscope– Indiansystemofmedicines–Siddha,Ayurvedha and Unani systems.

ClassificationofCrudedrugs.

UNITII **6hrs**

Organizeddrugs–DrugsobtainedfromWood–*Ephedra*. Drugs obtained from Barks– *Cinchona* .

Drugsobtainedfrom RootsandRhizomes–*Catheranthus,Rauwolfia*and*Ginger.*

UNITIII **6hrs**

Drugsobtainedfromleaves-*Aloevera,Gymnemasylvestre,Ocimumsanctum*.

Drugs Obtained from Flower –*Syzygium aromaticum.*

Drugsfromfruits–

Coriandrumsativum.DrugsfromSeed–

Strychnosnuxvomica.

PlantsandHerbs–*Bacopamonnieri,Andrographispaniculata*

UNITIV **6 hrs**

Pharmacologicalactionofplantdrugs-actionontheautonomicnervoussystem,central nervous system(*Mucuna pruriens, Withania somnifera*)

Heart,muscle,Bloodvessels(*Terminaliaarjuna,Azadirachtaindica*).

Gastro-intestinal tract (*Curcuma longa, Foeniculum vulgare*)

UNITV **6 hrs**

Collection of crude drugs-Harvesting of crude drugs-

Dryingofcrudedrugs(Naturaldryingandartificialdrying)

Garbling-packing of crude drugs

Storageofcrudedrug.Mar

keting.

Drugadulteration**.**

Textbooks

John Jothi Prakash, E. (2003).Medicinal Botany and Pharmacognosy. JPRPub, Vallioor, Tirunelveli.

GokhaleSBKokateCK&PurohitAP(1995).Pharmacognosy.NiraliPrakashan,Pune. Prajapathi, Purohit, Sharma and Kumar.(2003). A Hand book of Medicinal plants. AgrobiosPublications,Jodhpur.

Kumar,NC(1993).AnIntroduction toMedicalBotanyandPharmacognosy.

Chopra RN,Nayar SL andChopra IC(1956). Glossary of Indian medicinal plants. CSIR, New Delhi.

References

Kanny,Lall,DeyandRajBahadur,(1984).TheindigenousdrugsofIndia,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

UNITI **10 hrs**

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

UNITII **15hrs**

Inflorescence:Racemosetypes-Cymosetypes-Special type.
Morphologyofflower-Flowerasmodified-shoot
detailed structure of flowers-floral parts-their arrangement, Relative position, symmetry, Aestivation and placentation types- Floral Diagram and Floral Formula.
Fruits:Typesandclassification

UNITIII **15hrs**

Aim,ScopeandSignificanceoftaxonomy
Systemof Classification- Artificial(Linnaeus),Naturalsystem(BenthamandHooker) and Phylogenetic (Engler and Prantl)
AngiospermPhylogenyGroupsystem2009(APGIV)(Introductiononly).
OnlyoutlineofClassificationwithmeritsandDemerits needbeindicated.
Plant nomenclature- Binomial, ICBN/ICN - Principles-Rule of priority and author citation.Type concept.
Herbariumtechnique-
Preparationofherbarium,theirpreservation.Important herbaria, Flora and uses.

UNITIV **20 hrs**

Detailedstudyoffamilies: StudythefollowingfamiliesofBenthamand 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,

UNITV **20 hrs**

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

PRACTICAL3hrs/Week

1. Describetheplantpartswithsuitableplants-Technicaltermhabit,habitatform….types

ofleaves,withleafshape,margin,texture,modificationofleaf.

2. StudytheTypesandmodificationofrootandstem withsuitableexample
   Identify the following inflorescence and fruits:
   (a) Inflorescence-Simpleraceme,Spike,Corymb,Head,simplecyme,Cyathium And Hypanthodium.
   (b) Fruits
3. Floralformulafromfloral description.
   1. Identifythefamiliesmentionedinthesyllabusbynotingtheirvegetativeandfloral Characters.
   2. Studentsmustdescribethefloralparts,drawtheL.S.,floraldiagramandwritethe floral formula of at least one flower from each family
4. Studytheproducts ofplants mentionedinthesyllabus ofeconomicbotanywith Special reference to the morphology, botanical name and family.
5. Prepare**herbariumof15plants**withfield notes(internal assessment).
6. Conductfieldtripsforaminimumof3to5daysundertheguidanceofateacherand Submit field report.

TextBooks

Lawrence, GHM. (1995). The Taxonomy of vascular Plants (Vol I-IV), Central Book, Dept.,Allahabad.
HeywoodVH.(1967).PlantTaxonomy,EdwardArnold,London.
Jeffery C. (1982). An introduction to Plant Taxonomy, J& A Churchill Ltd., London.SivaraajanVV(1989).IntroductiontoPrincipleofPlantTaxonomy,OxfordandIBH, 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).TaxonomyofAngiosperms–S.Chand&Co.,NewDelhi. Sharma, O.P. (1996). Plant Taxonomy.TATA McGraw Hill, New Delhi.
GurcharanSingh.(2016).PlantsSystematics3edition.CRCPress.

References

Hutchinson,J.(1973).TheFamiliesofFloweingplants,OxfordUniversitypress, London.
Gamble,J.S,Fisher,L.E.F.(1967).TheFloraofThepresidencyofmadras(Vol-III) BSI, Calcutta.
Davis,P.HandHeywood,V.M.(1965).PrinciplesofAngiospermTaxonomy,Oliver and Boyd Edinburgh.
Mathew,K.M.(1983).TheFloraofTamilNaduCarnatic,TheRapinatHerbarium, Trichy.
Simpson MG(2006). Plant systematics, Elsevier Academic Press, USA.Takhtajan,AL.(1969).FloweringPlants–Originanddispersal–
Oliver&Boyed.Gangulee HC Das KS and Datta CT (1964). College Botany–Vol I, Basant
Panchami,Calcutta.
NarayanaswamyRVand Rao,KN(1976).Outlineofbotany.S.Viswanthanprinter and publisher,Chennai.
HeywoodVH(1967).PlantTaxonomy.London:EdwardArnold.

HillAF1982.EconomicBotany.:McGrawHill, NewYork.
1JainSKandRaoRR(1976).Ahandbookoffieldandherbariumtechnique.Today andtomorrow,,s Publishers, New Delhi.
JefferyC(1968).AnIntroductiontoPlantTaxonomy,JandAChurchill.London.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–V
CORECOURSE–VIIISUBJECTCODE21UBO06 CELL BIOLOGY

CYTOLOGY

UNITI 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,structureandfunctionofPlantcellwall.

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,proteinsortingandexportfrom 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. Toobservetheplantcellstructurewithonionepidermalpeelout.
2. Studyofthephotomicrographsofcellorganelles
3. Microscopicviewofcellorganellesinplantcells–Chloroplast(Hydrilaleaf)
4. Starchgrains(potato),Aleuronegrains(wheat),InulinCrystals(potato),Raphides (Petiole–Colacasia/Nymphaea) an d Cystoliths–(leaf peel out -Ficus/Momordica).
5. Studythepolyteneandlampbrushchromosomestructurethroughphotograph
6. Identification of different stages of mitosis by using squash and smear techniques – Onion Root tip.

TextBooks

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

References

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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–V

CORECOURSEIXSUBJECTCODE:21UBO07

GENETICS and PLANT BREEDING

GENETICS

UNITI **15hrs**

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

Multiplealleles-general account: ABObloodgroupin man.

UNITIl **15hrs**

Linkageandcrossingover,

Cytologicalbasisofcrossingover,mappingofgenesonchromosomes,Sexlinkagein *Drosophila*(Eyecolor)andHumans(colorblindness).

Cytoplasmicinheritance (Plastid inheritance-,Mitochondria-malesterilityinmaize)

UNITIII **15hrs**

Sexdeterminationinplants.Mutatio

ns.

Chromosomeaberrations-deficiencies,duplications,inversions,translocations.Polyploid types- aneuploids, euploids and allopolyploids.

Populationgenetics-Hardy– Weinbergprinciple.

PLANTBREEDING

UNITIV **15hrs**

PlantBreeding:Historicalaspectofplantbreeding.Objectivesofplantbreeding. Breeding Methods: Plant introduction - Types and procedures

Centersofdiversityand

originofcultivatedplantsVavilov'scentresoforigin.Acclimatization.

Selectionmethods,(pureline,clonalandmass)

UNITV **15 hrs.**

Hybridization:Typesandprocedureofhybridization. Heterosis,

Hybrid vigour.Somatic hybridization.

Antherculture and its Roleinplant breeding.

Roleofmutationand polyploidyin plant breeding.

PRACTICAL3hr/Week

1. SimpleproblemsofmonohybridandDihybridratiosandfactorinteraction
2. Constructionofchromosomemap–threepointtest cross.
3. DemonstrationofHybridizationtechnique.

TextBooks

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.PrenticeHallofIndiaPvtLtd.,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

MAJORELECTIVECOURESI–SUBJECTCODE:21UBOE01

PLANT AND ENVIRONMENTAL BIOTECHNOLOGY

UNITI **15hrs**

Biotechnology – History, scope and significance.
RecombinantDNAtechnology.RoleofRestrictionenzymes.
Cloningvectors–Plasmid,Cosmids,Bacteriophages.Transposons.Applications of Genetic Engineering.

UNITII **15hrs**

Gene transfer in plants - Aims, strategies for development of transgenic plants.
Directgenetransfermethods-Electrophoration,LipofectionandMicroinjection.
Indirect gene transfer– *Agrobacterium* mediated gene transfer.
Advantagesanddisadvantagesoftransgenic plant

UNITIII **15hrs**

Techniques and application of biotechnology– Polymerase chain reaction: Principle and Application of PCR and RTPCR.
–DNASequencing–Sanger‟smethod.
Introduction and application of molecular marker‟s –brief account DNA finger printing and Bar coding of plants.

UNITIV **15hrs**

Genesofagronomicinterestandtransgeniccrops:Goldenrice,BtcottonandBtbrinjal. Disease resistance.
Biosaftey and bioethics of transgenic plants.Enhancementofshelflifeofflowersandfruits.

UNITV **15 hrs**

EnvironmentalBiotechnology:Biodiversityandconversation.
Waste management - Solid waste; waste water, Biogas and phytoremediation(only outline).
Industrialbiotechnology–Bioethanol,Foodbiotechnology–SCP.
Improved food and food products

TextBooks

Kumaresan,V(2009).Biotechnology.SarasPublications,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). BiotechnologyFundamentals &Applications. 3rd Ed.Mrs. SaraswathiPurohitforstudentEdition,India.
Razdan,MK(2008) Introductiontoplanttissueculture.2nd ed. Oxford&IBHpublishing Co. Pvt. Ltd., New Delhi.

References

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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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-

biologicalN_2fixation.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.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER V

SKILLBASEDELECTIVECOURSE–VSUBJECTCODE:21UBOS05

BIOLOGICAL TECHNIQUES AND COMPUTER APPLICATION

UNITI **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.

UNITII **6hrs**

Microtechnique–preparationformicroscopicobservation–Wholemount,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.

UNITIII **6hrs**

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

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

PrincipleandApplicationofpHmeter,ColorimetryandSpectrophotometer.

UNITIV **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.

UNITV **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,4th ed) Cambridge University Press, Cambridge.

PalaniveluP(2013).AnalyticalBiochemistryandSeparationtechniques,20th century 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.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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. Photomorphogensis- Phytochrome – photoperiodism.Vernalization.Senescence.Plant movememts.

PRACTICAL3Hrs/Week

1. DeterminationofDPDbyusingRheo leaf/Onion leaf
2. EffectoftemperatureonMembranepermeability
3. EffectofchemicalonMembranepermeability
4. Calculationofstomatalindexandstomatalfrequencyofamesophyteanda Xerophyte
5. EffectoflightontranspirationusingGanong‟spotometer
6. Separationofplant pigments bypaper chromatography.
7. To studytheeffectof light intensityonPhotosynthesisbyusingWilmottsbubbler
8. Tostudytheeffectofandconcentration of CO_2 onPhotosynthesisbyusing Wilmott‟s bubbler

9. Measurementofrateofrespirationingerminatingseedusing Simple Respiroscope
10. Measurementofrateofrespiration inflowerbudsusing Simple Respiroscope

TextBooks

Pandey,SNandSinha,BK(2001).PlantPhysiology.Thirdrevisededition,Vikas publishing House Pvt. Ltd, New Delhi
Devlin,RM(1974).PlantPhysiology,AffiliatedEastWestPressPvt.Ltd
Noggle,GR.andFritz,GJ(1976).IntroductoryPlantPhysiology,Prentice -Hall,India.Jain ,VK (2007). Fundamentals of plant physiology, S. Chand &Compamy ltd, NewDelhi.
Nobel,PS(1970).IntroductiontoBiophysicalPlantPhysiology.W.H.Freemanand Company, San Francisco
Verma,V(2008).TextbookofplantPhysiology,Ane‟sstudentedition,NewDelhi. Bajracharya, D., (1999). Experiments in PlantPhysiology-A LaboratoryManual. NarosaPublishingHouse,NewDelhi.

References

Beevers,L(1976).Nitrogenmetabolisminplants.William&SonsLtd.London. Bray, CM (1983). Nitrogen Metabolism in Plants.Longman.
Kramer,PJ(1969).Plant andsoilwaterrelationship-AModernSynthesis.
Salisbury,FBandRoss,CW(1986).PlantPhysiology.Thirdedition,CBSPublishers and Distributors, New Delhi
Levitt(1972).ResponsesofplantstoenvironmentalstressAcademicpress,NewYork.Bidwell RGS (1979). Plant Physiology, Mac Millan Publishing Company. New Delhi. Taiz, Land Zeiger, E (1991).Plant physiology. The Benjamin/Cummings Publishingcompany,Inc.,California,NewYork.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–VI

CORE COURSE – XII

SUBJECTCODE:21UBO09P

LANT ECOLOGY AND PLANT GEOGRAPHY

UNITI **15hrs**

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

UNITII **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.

UNITIII **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.

UNITIV **15hrs**

Environmentalpollution-introduction, definition;
Air pollution- air pollutants, types, sources, effect of air pollution on plants and humans, control measures.
Waterpollution-waterpollutants,types,sources,impact.Controlmeasures.
Eutrophication.
SoilPollution-causes,sources,solidwaste,biodegradable,non-biodegradable,waste dumps, municipal waste, Agrochemical management of solid waste, Composting,
e– waste.

UNITV **15hrs**

Definition,Concept,Scopeandsignificanceofphytogeography.
Phytogeographical zones of India.
VegetatationaltypesinTamilnadu.
Hotspots–Endemicdistribution,AgeandAreaHypothesis.
Continental drift theory.Conservation – *Insitu* and *Ex situ*.

PRACTICALS3Hrs/Week

1. Studyofthemorphologicalandstructuraladaptationoflocallyavailablehydrophytes, Mesophytes, xerophytes to correlate to the particular habitat.
2. DeterminationofDissolvedoxygeninwater
3. Determinationofdissolvedcarbondi oxidein 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.
Daubenmire 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).TheGeographyofflowering Plants(2ndEdn.,)Longmans, Green&Co.,Inc., London&AlliedSciencePublishers,NewDelhi-495pp.,

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–VI

CORE COURSE –XIII SUBJECT

CODE:21UBO10

PLANT PROTECTION

UNITI **15 hrs**

Types of insects causing damage to crop.Nature and classification of plant nematodes. Damagetocropsof IndiabyInsects,Nematodes,Rodents,Fungi,Bacteriaandviruses-a general outline.

UNITII **15hrs**

Typesofplantdiseasesandcausalagents.A generalaccountofpreventivemeasuresof plantdiseasesincludingplantprotectionandquarantinemeasures. Legislationsinplant protection, seed certification, weed control.

UNITIII **15hrs**

Studyofsymptoms,etiologyand controlmeasuresofthefollowingdiseases:dampingoff of seedling, bud rot of coconut, black rust of wheat, blast of paddy, smut of maize, Tikka disease of groundnut.

UNITIV **15hrs**

Characteristic features of plant pathogenic bacteria. General symptoms of bacterial diseases.Survivalandspreadofbacterialplantpathogens.Insecttransmissionofbacteria. Studyof 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.

UNITV **15hrs**

NatureofPlantVirus.Transmissionofplantviruses.Causalorganism,symptoms,control measures of Viral diseases: Tobacco Mosaic, Bunchy top of banana, Mosaic disease of Lady‟s finger, Leaf Mosaic of Tapioca.
GeneralaccountofMycoplasmawithreferencetoLittleleafofbrinjalandPapayaleaf curl

PRACTICAL

1. Collectionand studyofdiseased plant materials.
2. Studyoffungal,bacterialandviraldiseasesmentionedinthesyllabus.
3. Handlingofplantprotectionappliances (Dusters,sprayers,andotherappliances.)
4. Preparationof5herbariumsheets ofPathology–specimensstudied

TextBooks

ChaudhuryandMajid,(1954).Hand Bookofplant protection.Department ofAgriculture, Government press, Shillong, Assam.
Agros,GN(1997)PlantPathology(4th ed.)AcademicPress.
BilgramiKH.and DubeHC(1976).AtextbookofModernPlantPathology.International BookDistributing Co. Lucknow.
Mehrotra,RS(1980).PlantPathology–TMH,NewDelhi.
Pandey,BP.(1999).PlantPathology-PathogenandPlantdiseases.Chand&Co.New

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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–VI

MAJORELECTIVECOURSE–IISUBJECTCODE: 21UBOE02

BIOCHEMISTRY

UNITI **15hrs**

Atomic structure of elements. Bonding: Covalent and non-covalent bonds - Hydrogen bond,VanderWaal"sforces.Structureandpropertiesofwater,AcidsandBases-pHand Buffer system.

UNITII **15hrs**

Carbohydrates: Structure and properties of Mono - Disaccharides , polysaccharides.Chemicalstructureandfunctionofstarchandcellulose.

UNITIII **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- tertiarystructure -quaternary structure–function of protein

UNITIV **15hrs**

Enzymes:Nomenclature,classification-mechanismandregulationofenzymeaction, enzyme kinetics, factors affecting enzymeaction .

UNITV **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.

TextBooks

Rastogi,S.C(2003).OutlinesofBiochemistry, CBSPublishers&Distributors,New Delhi
Stryer,L.,(1988).Biochemistry,WHFreeman&Co.,NY.
JainJ.L.*etal.*,(2008).FundamentalsofBiochemistry,Chand,NewDelhi. Connet al.(2005). Outlines of Biochmistry5/Ed, Wiley&Sons Pvt. Ltd.
SatyanaryanaU,ChakrapaaniU,(2006).Biochemistry,BooksandAllied(P)Ltd.

References

Apps*etal*.,(1992).Biochemistry.ELBS.
Caretetal.,(1993). Inorganic,OrganicandBiologicalChemistry,WMCBrownPub. USA.
NelsonD.L,CoxM.M.(2005).LehningerPrincipleofBiochemistry,W.H.freemanand Company, New York.
Rawn,D.(1989).Biochemistry,NeilPatterson.
ZuleyG.L.,(1998).Biochemistry, Wm.C.BrownPublishersUSA.

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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

SEMESTER–VI
SKILLBASEDELECTIVECOURES-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.
Kowslowsky.SeedBiology.Vol.I,Vol.IIandVol.III.AcademicPress,NewYork.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

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

UNITI **12 hrs**

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

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

UNITII **12hrs**

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

Bryophytes:GeneralCharacters.Studyofthestructureandlifecycleof*Marchantia.*

UNITIII **12hrs**

PteridophytesandGymnosperms: Structureandlifecycleof*Lycopdium*and*Cycas.*

UNITIV **12 hrs**

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

Nitrogencycle.

Hormones(Auxinsonly).

UNITV **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).ThavaraviyalThunaippaadam(Tamil),MohanPadippagam, Chennai.

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

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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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. Toidentifytheplantfamilyandmorphologyofthepartsusedforthefollowing 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. *Arecacatechu*-Nut
18. *Cocosnucifera*-Kernal

3. TomakesuitableMicropreparations,describeandidentifymaterialsofAlgae,Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms prescribed.

4. Todescribesimpleexperimental 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).ThavaraviyalThunaippaadam(Tamil)Vol IandII,Mohan Padippagam, Chennai.
PandeyB.P,1986,TextBookofBotany(CollegeBotany)Vol Iand II,S.ChandandCo. New Delhi.
RasoolSKandSekarT(2002).AlliedBotany,PopularBookHouse,Chennai-15.

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

MODELQUESTION PAPER

B.Sc.,BotanyDegreeExamination

((ForStudentsAdmittedfromtheAcademicYear2021–2022onwardsunderCBCS Pattern)

CORECOURSE– II. MAJORPRACTICALISUBJECTCODE21UBOP01
(CoveringthecorecoursesI &III)
(ALGAE,BRYOPHYTES,FUNGI,LICHENS,BACTERIA,VIRUSES)

Time:3hrs. **Maximum:60Marks**

Practical:50MarksRec

ord : 10 Marks

1. CuttransversesectionofA,BandC.Stainandmountinglycerin. Identifygivingreason. Draw diagrams. Leave the slides for valuation. (7X3=21)

2. Drawdiagramsandwritenotesofintereston D,E,F,andG. (4X4=16)

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

4. IdentifyandwritenotesoneconomicimportanceofK, L,and M. 2X2=4

Key

A-Algae
B-Fungi
C-Bryophytes

(Preperation-2,Identification-1,Diagram-2,Reason-2) (7X3=21)

D-Algae-slide
E-Fungi-slide
F-Bryophyte-slide
G-Lichens-fruitbodyBacteria/Viruses-electronmicrograph
(Identification -1, Diagram -1 , Reason -2) (4X4=16)

H -Algae
I-Fungi
J-Bryophytes
(Genus 1, Group 1, Morphology1) (3X3=9)

K–Algae/Fungi
L-Bacteria/Viruses
(identification1,importance1) (2X2=4)

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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:50MarksRec ord : 10 Marks

1. CuttransversessectionsofA,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,Identification1,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. ReferAandB,totheirrespectivefamilies.Pointoutthecharactersonwhichtheidentificationisbasedat each level. (Diagrams not necessary) (2X4=8 Marks)

2. Makeacetocarminepreparation ofC(Squash)anyonestage.drawdiagram. 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. Constructthechromosome mapwiththedataprovided E 5Marks

5. SolvethegivengeneticproblemFandG (2X4=8Marks)

6. SpotatsightHandI (2X2=4Marks)

7. Writethename ofthegenus, species, familyandmorphologyoftheusefulparts ofJand K –(4X2=8Marks)

8. BrieflydescribetheplantbreedingtechniqueinspotterL 3Marks

Key

A&B-Family -2X4=8marks
C-Onionroottip-preparation =3marks,diagram -1 marks -4marks
D-Plantwithflowers–preparation-1marks,Floral diagram–2marks, Floral formula-2marks -5 marks
E-Chromosomemap -5 marks
F&G-Geneticproblems -2X3= 8marks
H&I-Cytologyspotter-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

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

MODELQUESTION PAPER

B.Sc.,BotanyDegreeExamination

((ForStudentsAdmittedfromtheAcademicYear 2021–2022onwardsunderCBCSPattern)

CORECOURSE–XV.SUBJECTCODE:21UBOP04

MAJOR PRACTICAL IV
(Coveringthecorecourses XI,XII&XIII)

(PLANTPHYSIOLOGY,PLANTECOLOGYANDPLANTGEOGRAPHY, PLANT PROTECTION)

Time:3hrs. **Maximum:60Marks**
Practical:50MarksR
ecord:10Marks.

1. Outlinetheprocedure,apparatusandmaterialsrequiredforinvestigatingthephysiological 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‟. Draw diagrams. Describe the symptoms and list the control measures. (2X8=16)

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4. Commenton„F‟ 2Marks

Key

A-Physiology-Materials–2marks,Procedure-4, Setup–4marks,SpotViva-strictlypertainedtothe concerned physiology experiment- 2 marks-Result - 4marks

B&CEcologymaterial –preparation-2marks,identification-1mark,Diagram-2reason-3marks

D,E,-Anydiseaseinthesyllabus -Namedisease–1marks,Causativeorganism –1marks,Symptom-2 Control measure – 2 marks, diagram –2marks)
G-Plantprotectionappliances–2marks

PERIYARUNIVERSITY,SALEM–636011

B.Sc.,BOTANY

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

MODELQUESTION PAPER

(ForStudentsAdmittedfromtheAcademicYear2021–2022onwardsunderCBCSPattern)

B.Sc.,BOTANYALLIEDPRACTICALSUBJ
ECTCODE: 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 giving reasons. 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 specimensgiveninthepracticalsyllabus. 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.PhysiologyExperimentP 3 Mark