

Vellalar College for Women (Autonomous), Erode - 12.

Bachelor of Science in Botany

2016 - 2017 Onwards

Course Content and Scheme of Examinations (CBCS Pattern)

Semester I

Part	Study Components	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	Max. Marks			Credits
						CIA	ESE	Total	
I	Language I	15TAMU101/ 14HINU101	Tamil / Hindi	6	3	25	75	100	3
II	Language II	13ENLU101	English	6	3	25	75	100	3
III	Core	16BOUC101	Paper I Plant Diversity I - Algae, Fungi, Lichen, Bacteria, Virus & Plant Pathology	6	3	25	75	100	4
			Practical - I Paper I	3					
	Allied I	16ZOUA101	Zoology - Paper I	4	3	20	55	75	4
			Practical - I Paper I	3					
IV	Foundation course	09FOCU1ES	Environmental studies	2	3		100	100	2
Total								475	16

Semester II

I	Language I	15TAMU202/ 14HINU202	Tamil / Hindi	6	3	25	75	100	3
II	Language II	13ENLU202	English	6	3	25	75	100	3
III	Core	16BOUC202	Paper II Plant Diversity II Bryophytes, Pteridophytes, Gymnosperms & Palaeo Botany	6	3	25	75	100	4
			Practical - I Paper II	3					
			16BOUCP01	Practical - I (Exam)		3	40	60	100
	Allied I	16ZOUA202	Zoology Paper II	4	3	20	55	75	4
			Practical - I Paper II	3					
			16ZOUAP01	Practical - I (Exam) Paper I & II		3	20	30	50
IV	Value Education	14VEDU2HR	Value Education and Human Rights	2	3		100	100	2
Total								625	22

SEMESTER - I

CORE PAPER I

PLANT DIVERSITY – I ALGAE, FUNGI, LICHENS, BACTERIA, VIRUS AND PLANT PATHOLOGY

Instructional Hrs. : 90

Sub.Code : 16BOUC101

Max. Marks :CIA – 25; ESE - 75

Credits : 4

Objectives :To know the classification of primitive plants, vegetative and reproductive structures and economic importance of Algae, Fungi and Microorganisms.To know some specific diseases seen in plants and their control measures.

UNIT – I

18Hrs.

Algae - Classification of Algae (G.M. Smith ,1955) - Study of the Structure - Reproduction and Life cycle of *Anabaena*– Chlamydomonas – Volvox – Oedogonium - Caulerpa and Chara.

UNIT-II

18 Hrs.

Structure - Reproduction and Life cycle ofDiatoms – Pennate and Centric – Ectocarpus-Dictyota and Polysiphonia- *Economic importance of Algae*.

UNIT – III

18 Hrs.

Fungi - Classification of Fungi (Alexopoulos , 1962) - Structure - Reproduction and Life cycle of *Albugo*– Rhizopus – Saccharomyces -Aspergillus - Peziza - Puccinia and Agaricus.

UNIT – IV

18 Hrs.

Structure - Reproduction and Life cycle of *Lycoperdon* - Cercospora – Fusarium and Alternaria- Economic importance of Fungi. Structure and Reproduction of Lichens – Crustose - Foliose and Fruticose.

UNIT – V

18 Hrs.

Structure and Reproduction of Bacteria and *Bacteriophage*(T₄). Plant Diseases: Bunchy top of banana – Tikka disease - Blight disease of paddy (symptoms - causal organisms and control measures).

Note : Bold andItalics denote self study Topics

PRACTICALS :

1. Demonstration of simple microscopes – dissection and compound

2. Demonstration of sectioning, staining and mounting

3. Study of the types mentioned below:

Algae - Anabaena – Chlamydomonas – Volvox – Oedogonium - Caulerpa – Chara - Diatoms – Pennate and Centric – Ectocarpus - Dictyota – Polysiphonia

Fungi - Albugo – Rhizopus – Saccharomyces -Aspergillus - Peziza - Puccinia – Agaricus - Lycoperdon- Cercospora – Fusarium – Alternaria- Lichens- Bacteria - Virus

Plant Diseases - Bunchy top of banana – Tikka disease- Blight disease of paddy

TEXT BOOKS :

1. **Vashishta, B.R.**, “*Botany for Degree Students –Algae*”, S. Chand & Co., New Delhi, Revised Edition, 2004.
2. **Vashishta, B.R.**, “*Botany for Degree Students – Fungi*”, S. Chand & Co., New Delhi, Revised Edition, 2003.
3. **Pandey, B.P.**, “*Plant Pathology*”, S. Chand & Co., New Delhi, Revised Edition, 2003.

REFERENCE BOOKS :

1. **Srivastava, H.N.**, “*Fungi*”, Pradeep Publications, Jalandhar (India), New Millennium Edition, 2004.2.
2. **Sethi, I.K., and Walia, S.K.**, “*Textbook of Fungi and their Allies*”, Macmillan Publishers India Ltd. 2011.
3. **Johri, R.M., Latha, S. and Tyagi, K.** “*A Textbook of Fungi*” Dominant Publishers and Distributors Pvt. Ltd. New Delhi, 20116.
4. **Mehrotra, R.S.**, “*Plant Pathology*”, Tata Mc Graw Hill Publishing Company Ltd. , New Delhi, 1996.
5. **Bilgiri, K.S. and Dube, H.C.**, “*A text book of Modern Plant Pathology*”, Vikas Publishing House, PVT., LTD., Kanpur, 1980.

SEMESTER - I

Foundation Course - ENVIRONMENTAL STUDIES

Instructional Hrs. : 30

Sub. Code : 09FOCU1ES

Max. Marks : ESE - 100

Credits : 2

Objectives : To study the science of environment. It is the prime duty of the human to provide a better and clean environment for the generation to come.

UNIT - I

6 Hrs.

The multidisciplinary nature of environmental studies -Definition - Scope and importance - Need for public awareness - Natural resources and associated problems – Forest resources - Water resources - Mineral resources - Food resources - Energy resources - Land resources - Role of an individual in conservation of natural resources - Equitable use of resources for sustainable life styles.

UNIT – II

6 Hrs.

Concept of Ecosystem - Structure and function of an ecosystem – Producers - Consumers and Decomposers. Energy flow in the ecosystem –Food chain - Food webs and Ecological pyramids - Ecological succession.

UNIT - III

6 Hrs.

Biodiversity and its Conservation - Introduction – definition- genetic species and ecosystem diversity. Conservation of biodiversity – *In –situ* and *Ex-situ* conservation of biodiversity.

UNIT - IV

6 Hrs.

Environmental Pollution - Definition – causes - effects and control measures of air pollution- water pollution- soil pollution- noise pollution and thermal pollution. Disaster management – floods- earthquake- cyclone and landslides.

Social Issues and the Environment - Global warming - Ozone layer depletion- Acid rain- Nuclear accidents and Social issues - Holocaust (case studies). Consumerism and waste products- Environmental protection Act - air- water- wildlife- forest- Issues involved in enforcement of environmental legislation and Public awareness.

FIELD WORK

Visit to a local area to document environmental assets – river/ forest/ grass land/ hill/ mountain.

Visit to a local polluted site – urban/ rural/ industrial/ agricultural.

Study of common plants, insects, birds.

Study of simple ecosystems – pond, river, hill slope, etc.

REFERENCE BOOK :

1. **Professor Ranganathan, S., et al.**, “*Environmental studies*”, Publication Division, Bharathiar University, Coimbatore, First Edition, 2004.

SEMESTER - II

Core Paper II - PLANT DIVERSITY - II

BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY

Instructional Hrs. : 90

Sub.Code : 16BOUC202

Max. Marks : CIA – 25; ESE - 75

Credits : 4

Objectives: To study the classification, morphology, anatomy and reproduction of some forms of Bryophytes, Pteridophytes and Gymnosperms.

To study the Geological time scale and some kinds of fossils.

UNIT – I

18 Hrs.

Bryophytes - Classification of Bryophytes (Reimer's, 1954- Outline only) Structure and Reproduction of *Marchantia*- Porella- Anthoceros and Funaria - Economic Importance of Bryophytes.

UNIT – II

18 Hrs.

Pteridophytes - Classification of Pteridophytes (Sporne, 1962 - Outline only) Stellar evolution- Structure and Reproduction of *Psilotum*- Lycopodium- Selaginella and Equisetum.

UNIT – III

18 Hrs.

Structure and Reproduction of *Ophioglossum*- Adiantum - Marsilea- Heterospory and Seed Habit.

UNIT - IV

18 Hrs.

Gymnosperms - Classification of Gymnosperms (Sporne, 1965- Outline only) Structure and Reproduction of Cycas- and Gnetum. Angiospermic characters in Gnetum, *Economic Importance of Gymnosperms*.

UNIT – V

18 Hrs.

Palaeobotany - Geological time scale- Radio carbon dating- Fossils and *kinds of fossils*-

Study of the following: Lepidodendron (Stem) - Lepidophyllum (Leaf)- Lepidocarpon (Fruit)- Calamites (Stem) and Williamsonia.

Note : **Bold** and *Italics* denote self study topics

PRACTICALS :

Study of the types mentioned below

Bryophytes - Marchantia, Porella, Anthoceros and Funaria

Pteridophytes - Lycopodium, Selaginella, Equisetum, Ophioglossum, Adiantum, Marsilea.

Gymnosperms - Cycas and Gnetum

Palaeobotany -Lepidodendron, Lepidophyllum ,Lepidocarpon ,Calamites and Williamsonia.

TEXT BOOKS :

1. **Vashishta, B.R.,Sinha,A.K. and Adarshkumar**, “*Botany for degree students – Bryophyta*”, S. Chand & Company Ltd., New Delhi, Revised Edition, 2008.
2. **Vashishta, P.C.,Sinha,A.K. and Anilkumar**, “*Botany for degree students - Pteridophyta*”, S. Chand & Company Ltd., New Delhi, Revised Ninth Edition, 2005.
3. **Vasishtha, P.C., Sinha,A.K. and Anilkumar**, “*Botany for Degree Students – Gymnosperms*”. S.Chand& Co., New Delhi, 2006.

REFERENCE BOOKS :

1. **Peter George**, “ *Introduction to Palaeobotany*”, Rajat Publications, New Delhi, First Edition, 2008.
2. **Sporne, K.R.**, “ *The Morphology of Pteridophytes*”, B. I Publications, NewDelhi, 1967.
3. **Foster,A. S. and Gifford, E. M.** Comparative Morphology of Vascular Plants. W.H. Freeman and Co.,1973.
4. **Watson,E.V.**,“*Structure and life of Bryophytes,*” Hutchinson & Co Ltd, 2003.
5. **Frank Cavers**, “*The interrelationship of the Bryophyta*” S.R. Technico Book House, Patna.2003.

SEMESTER – II

FOUNDATION COURSE- A VALUE EDUCATION AND HUMAN RIGHTS

Instructional Hours: 30

Paper Code:14VEDU2HR

Max Marks: 100

Credits:2

Objectives: On successful completion of the course, the students should have understood the significance of human values and the rights.

UNIT- I

5hrs.

Aim of Value Education –Concept of Human Values-Types of Values- Components of value education - Personal Development :*Character formation towards positive personality*-National Values.

UNIT- II

5hrs.

Concept and theories of Human Rights – *Classifications of Human Rights* – Universal Declaration of Human Rights- International Covenant on civil and political rights – International covenant on Economic, Social and Cultural Rights.

UNIT- III

10hrs.

Rights Guaranteed by Indian Constitution - Constitutional vision of freedom: Fundamental Rights – *Fundamental duties*- Constitutional vision of Justice: Directive Principles of State policy.

UNIT- IV

5hrs.

Human Rights Issues: Gender Discrimination-*Domestic violence*-Child Labour-Bonded Labour

UNIT- V

5hrs.

Human Rights Enforcements : National Human Rights Commission – State Human Rights Commission – Human Rights Courts – Role of NGO's : Amnesty International, Asia Watch – *Peoples Union for Liberties(PUCL)*, Peoples Union for Democratic Rights (PUDR).

Note: Bold and Italics denote self study topics

Books for Reference:

1. Mugammad Naqi, *Modern Value Education*, Anmol Publications Pvt Ltd, New Delhi, 2007
2. Shrimali L.L, *A Search for Values in Indian Education*, Vikas Publishers, Delhi, 1974.
3. Acharya. N.K, *The Constitution of India*, Asia Law House, Hyderabad, 2011.
4. Misra R., "*Human Rights*" Sumit Enterprises, New Delhi, First Edition, 2005.
5. Nirmal S.J, "*Human Rights in India*", Oxford University Press, New Delhi, 2000.
6. Durgadas Basu, *Human Rights in Constitutional Law*, Prentice Hall of India, 1994.
7. Bajwa G.S., *Human Rights in India*, Anmol Publications, New Delhi, 1995.

VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS), ERODE

B.Sc., DEGREE PRACTICAL EXAMINATION,

Model Question Paper Pattern

Core Practical –I

**ALGAE, FUNGI, LICHENS, BACTERIA, VIRUS, PLANT PATHOLOGY,
BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY**

Hrs. : 3

Sub.Code : 16BOUCP01

Max. Marks : CIA – 40; ESE - 60

Credits : 4

- I. Make suitable micropreparations of **A, B, C** and **D**. Draw labelled Sketches. Identify with reasons and submit the slides for valuation 4 x 5 = 20
- II. Analyze the algal mixture **E** and identify any two genera with reasons 2 x 4 = 8
- III. Identify, draw diagrams and write notes on **F, G, H,** and **I** 4 x 4 = 16
- IV. Identify the disease, write symptoms, causal organism and control measures of **J** 6

50

Record 10

Total 60

PRACTICAL – I
SCHEME OF VALUATION

I.	A – Fungi	Identification	- 1	
	B – Bryophyte	Slide	- 1	
	C - Pteridophyte	Sketch	- 1	
	D – Gymnosperm	Reasons	- 2	
				4 x 5 = 20
II.	E – Algal mixture	Identification	- 1	
		Sketch	- 1	
		Notes	- 2	
				2 x 4 = 8
III.	F- Algae / Fungi / Pteridophytes / Bryophytes	Identification	- 1	
	G - Lichen	Sketch	- 1	
H-	Bacteria / Virus	Notes	- 2	
I	-Palaeobotany			4 x 4 = 16
IV.	J - Plant pathology	Identification	- 1	
		Symptoms	- 2	
		Causal organism	- 1	
		Control measures	- 2	
				1 x 6 = 6
				----- 50
				Record 10
				----- Total 60 -----

SEMESTER - I

ALLIED BOTANY - PAPER - I

Instructional Hrs. : 60

Sub.Code : 16BOUA101

Max. Marks : CIA – 20; ESE - 55

Credits : 4

Objectives : To know the vegetative and reproductive structures of various types of Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms. To identify the families of the plants, economically important plants, plant products and the bioprocess technology and their applications.

UNIT-I

12 Hrs.

Structure and Reproduction of Bacteria and *Bacteriophage* (T₄). Plant Disease: Tikka Disease (symptoms- causal organisms and control measures).

UNIT-II

12 Hrs.

Thallophyta - Structure- Reproduction and Life cycle of the following – Nostoc – *Chlorella*- Dictyota – Albugo, Saccharomyces, Polyporus and Cercospora.

UNIT –III

12 Hrs.

Bryophyta- Pteridophyta- Gymnosperm - Structure - reproduction and life cycle of *Riccia* – Funaria- Lycopodium- Marsilea- Cycas and Pinus.

UNIT-IV

12Hrs.

Plant Taxonomy - Study of the following families with their Systematic position- Description and *Economic importance* of Anonaceae – Rubiaceae – Cucurbitaceae, Acanthaceae, Amarantaceae and Poaceae.

UNIT –V

12 Hrs.

Applied Botany - Single cell protein - *Spirulina*. Mushroom Cultivation – Oyster - Biofertilizer – Rhizobium.

Note : Bold and *Italics* denote Self study Topics

PRACTICALS :

Study of the types mentioned above

TEXT BOOKS:

1. **Kumaresan, V.**, “*Biotechnology*”, Saras Publication, Nagercoil, Kanyakumari Dt., Revised Edition, 2009.
2. **Muneeswaran, A.**, “*Text book of Botany*”, Sun Publication, Madurai, 1990.
3. **Narayanaswami, R.V.& Rao, K.N.**, “*Outlines of Botany*”, S. Viswanathan Printers & Publishers, Madras, New Edition, 1979.
4. **Pandey, B.P.**, “*Economic Botany*”, S. Chand & Company, New Delhi, Revised Edition, 2004.
5. **Srivastava, H.N.**, “*Fungi*”, Pradeep publications, Jalandhar (India), New Millennium Edition, 2004.
6. **Vashishta, B.R.**, “*Botany for Degree Students – Algae*”, S. Chand & Co., New Delhi, Revised Edition, 2004.
7. **Vashishta, B.R., Sinha, A.K. and Adarshkumar**, “*Botany for Degree students – Bryophyta*”, S. Chand & Company Ltd., New Delhi, Revised Edition, 2008.
8. **Vasishta, P.C., Sinha, A.K. and Anilkumar**, “*Botany for Degree Students – Gymnosperms*”. S.Chand& Co., New Delhi. 2006
9. **Vashishta, P.C., Sinha, A.K. and Anilkumar**, “*Botany for Degree students - Pteridophyta*”, S. Chand & Company Ltd., New Delhi, Revised Ninth Edition, 2005.

REFERENCE BOOKS:

1. **Sporne, K.R.**, “ *The Morphology of Pteridophytes*”, B. I Publications, NewDelhi, 1967.
2. **Foster, A. S. and Gifford, E. M.** Comparative Morphology of Vascular Plants. W.H. Freeman and Co., 1973.
3. **Frank Cavers**, “*The interrelationship of the Bryophyta*” S.R. Technico Book House, Patna. 2003.

SEMESTER - II

ALLIED BOTANY - PAPER - II

Instructional Hrs. : 60

Sub.Code : 16BOUA202

Max. Marks : CIA – 20; ESE - 55

Credits : 4

Objectives : To study the histology, ecological adaptations and physiology of plants. To study the horticultural techniques. To gain the knowledge about medicinal plants.

UNIT-I

12 Hrs.

Anatomy - Meristem –Types. Simple and Complex tissues - Primary structure of Dicot and Monocot root, Dicot and *Monocot stem*, Dicot and Monocot leaf.

UNIT –II

12Hrs.

Ecology - Ecosystem – Structure (Biotic and Abiotic) and functions - Morphological and Anatomical adaptations of Hydrophytes and *Xerophytes*.

UNIT-III

12 Hrs.

Physiology - Photosynthesis- Photosynthetic apparatus- Light and Dark reactions (Calvin cycle) - Respiration- Glycolysis and *Kreb`s cycle*(outline only)

UNIT-IV

12 Hrs.

Horticulture - Scope and importance - Propagating methods of Horticultural Plants – *Layering*, Grafting, Kitchen garden, Terrace garden and flower arrangement- Cultivation methods of commercial flowers- Rose- Jasmine.

UNIT –V

12 Hrs.

Pharmacognosy - A brief account on the identifying features- medicinal properties and active principles of the following: Ginger – Vasaka – Curcuma – *Brahmi*- Cultivation and marketing of commercial medicinal plants – *Vinca* and *Aloe vera*.

Note : **Bold** and *Italics* denote self study topics

PRACTICALS :

Study of the types mentioned above

TEXT BOOKS:

1. **Kumaresan, V.**, “ *Horticulture*”, Saras Publication, Nagercoil, Kanyakumari Dt., First Edition, 2008.
2. **Muneeswaran, A.**, “*Text book of Botany*”, Sun Publication, Madurai, 1990.
3. **Pandey, B.P.**, “ Plant Anatomy”, S. Chand & Company Ltd., New Delhi, Revised Edition, 2004.

REFERENCE BOOKS:

1. **Kokate, C.K, Purohit, A and Gokhal, S.R.**, “*Pharmacognosy*”, NiraliPrakashan, Pune, 43rd Edition, 2009.
2. **Handa, S.S and Kapoor, V.K.**, “*Pharmacognosy*”, Vallabh Prakashan, Delhi, Revised Edition, 1993.

VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS), ERODE

B.Sc., DEGREE PRACTICAL EXAMINATION,

Model Question Paper Pattern

Allied Botany Practical

ALLIED BOTANY

Hrs. : 3

Sub.Code : 16BOUAP01

Max. Marks : CIA – 20; ESE - 30

Credits : 2

I. Assign the specimen **A** to its family and describe it technically.

Draw the diagrams 3

II. Comment on **B** with its medicinal value. 2

III. Cut transverse section of **C** and **D**. Draw labelled sketches and identify

giving reasons. Submit the slides for valuation. 2 x 3 = 6

IV. Draw labelled sketches, identify and give reasons **E, F, G, H, I** and **J** . 6 x 2 = 12

V. Comment on the setup **K**. Draw labelled sketch 2

25
Record 5

Total 30

PRACTICAL – I
SCHEME OF VALUATION

IA - Taxonomy	Family	- 1	1 x 3 = 3
	Description	- 1	
	Diagram	- 1	
IIB- Medicinal Botany			1 x 2 = 2
III C – Pteridophyte / Gymnosperm	Slide –1 Identification	- 1	
D – Anatomy	Diagram & Reason	- 1	2 x 3 = 6
IV. E- Bacteria/Virus	Identification	- $\frac{1}{2}$	
F - Algae / Fungi	Diagram	- $\frac{1}{2}$	
G - Bryophyte / Pteridophyte	Reason	- 1	
H - Gymnosperm / Tissues			
I - Horticulture / Applied Botany			
J - Ecology/ Plant Pathology			6 x 2 = 12
V. K - Plant physiology	Diagram	- 1	
	Comment	- 1	1 x 2 = 2
			----- 25
			Record 5
			----- Total 30 -----

Vellalar College for Women (Autonomous), Erode - 12.

Bachelor of Science in Botany

2015 - 2016 Onwards

Course Content and Scheme of Examinations (CBCS Pattern)

Semester III

Part	Study Components	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	Max. Marks			Credits
						CIA	ESE	Total	
I	Language - I	14TAMU303/ 15HINU303	Tamil /Hindi	6	3	25	75	100	3
II	Language - II	13ENLU303	English	6	3	25	75	100	3
III	Core	15BOUC303	Paper III - Anatomy & Embryology	4	3	25	75	100	4
			Practical - II Paper III	2					
	Allied II	11CHUA001	Chemistry - Paper I	5	3	20	55	75	4
			Practical - II Paper I	2					
IV	Skill Based Subject I	15BOUS301		3	3	25	75	100	3
	Basic Tamil/ Advanced Tamil/ Non - Major Elective I	15BOUN301		2	-	100	-	100	2
					3	25	100		
					3	-	100		
Total								575	19

Semester IV

I	Language - I	14TAMU404/ 15HINU404	Tamil /Hindi	6	3	25	75	100	3
II	Language-II	13ENLU404	English	6	3	25	75	100	3
III	Core	15BOUC404	Paper IV Cell Biology & Tissue Culture	4	3	25	75	100	4
			Practical - II Paper IV	2					
			15BOUCPO2	Practical - II (Exam) Paper III & IV		3	40	60	100
	Allied II	11CHUA002	Chemistry - Paper II	5	3	20	55	75	4
			Practical - II Paper II	2					

		15CHUAPO1	Practical-II (Exam) Paper I & II		3	20	30	50	2
IV	Skill Based Subject II	13BOUS402		3	1*	40	60	100	3
	Basic Tamil/ Advanced Tamil/ Non - Major Elective II	15BOUN402		2	-	100	-	100	2
3					-	100			
3					-	100			
Total								725	25
* Online Examination									

Vellalar College for Women (Autonomous), Erode - 12.

Bachelor of Science in Botany

2015- 2016 Onwards

Course Content and Scheme of Examinations (CBCS Pattern)

SKILL BASED SUBJECTS

S.No.	Subject Code	Title of the Paper
1	15BOUS301	Herbs and Health (Cafeteria)
2	13BOUS402	Multi Skill Development Paper*
3	15BOUS503	Herbal Botany (Cafeteria)
4	15BOUS604	Mushroom Technology (Cafeteria)

BASIC TAMIL / ADVANCED TAMIL/ NON MAJOR ELECTIVES

S.No.	Subject Code	Title of the Paper
1	14TMLU301	Basic Tamil*
	14TMLU402	
2	14ADTU301	Advanced Tamil**
	14ADTU402	
3	15BOUN301	Ornamental Horticulture
	15BOUN402	Nursery and Landscaping

* For Students whose Part I in secondary education is not Tamil

** For Students whose Part I in Higher secondary education is not Tamil

SELF LEARNING SUBJECT

S.No.	Subject Code	Title of the Paper
1	13AUGSL05	General awareness (Optional) (Online)
2	13BOUSL03	Preservation Techniques (Optional)

*Online examination for three units for a maximum of 60 marks.

Units IV & V are CIA for a maximum of 40 marks.

SEMESTER - III

Core Paper III - ANATOMY AND EMBRYOLOGY

Instructional Hrs. : 60

Sub. Code: 15BOUC303

Max. Marks: CIA – 25; ESE - 75

Credits: 4

Objectives: To study types of tissues and primary, secondary structures & anomaly of stem and root. To study the types and development of male and female gametophyte and embryo.

UNIT – I

12 Hrs.

Anatomy - Meristem –Types – Theories of Shoot and root apex organizations - General account of simple and complex tissues - Vascular cambium- Types of stomata and *trichomes*.

UNIT – II

12 Hrs.

Primary structure -Dicot root and stem - *monocot root* and stem- Structure of dicot leaf and monocot leaf.

UNIT – III

12 Hrs.

Secondary structure- Secondary thickening- Dicot root and stem - Anomalous secondary thickening - *Cortical vascular bundles (Nyctanthes)*- Medullary vascular bundles (Piper)and secondary thickening in arborescent monocots (*Dracaena*).

UNIT – IV

12 Hrs.

Embryology - Structure and development of anther- development of male gametophyte - structure and types of ovules, development of female gametophytes (Monosporic – *Polygonum*- Bisporic – *Allium* and Tetrasporic – *Peperomia*)- Fertilization - *Double fertilization*

UNIT – V

12 Hrs.

Endosperm – Nuclear, Cellular, Helobial, Ruminant and Endosperm haustoria -Embryo - Structure and development of dicot embryo (*Capsella*) - Structure and development of *monocot embryo* (*Najas*).

Note :*Italics* denotes Self Study Topics

PRACTICALS :

Anatomy :

Study of tissues mentioned in the theory. Stem - Primary structure – Tridax – Sorghum, Root - Primary structure – Bean – Canna, Leaf – Polyalthia and Maize, Secondary thickening-Stem- Thespesia, Root - Ficus . Anomalous secondary thickening – Piper - Nyctanthes and Dracaena.

Embryology:

T.S of anther - types of ovules- - Embryo mounting – Tridax/ Crotalaria. Endosperm –Cellular Endosperm with haustoria

TEXT BOOKS:

1. **Pandey, B.P.**,“ Plant Anatomy”, S. Chand & Company Ltd., New Delhi, Revised Edition, 2005.
- 2.**Bhojwani, S.S. and Bhatnagar, S.P.**, “ *The Embryology of Angiosperms*”, Vikas Publishing House Pvt Ltd., New Delhi, Revised Edition, 2007.

REFERENCE BOOKS:

- 1.**Fahn, A.**,“ *Plant Anatomy*”, Robert Maxwell, M.C., New York, Revised Edition, 1982.
- 2.**Katherine Esau**,“ *Plant Anatomy*”, Wiley Eastern Private Ltd., New Delhi, Second Edition, 1974.
- 3.**Maheswari . P.**, “*An Introduction to the embryology of Angiosperms*”, Mc Graw-Hill Book Company, Inc. New York, Revised Edition,1994.

SEMESTER - III

Skill Based Subject I - HERBS AND HEALTH

Instructional Hrs. : 45

Sub. Code : 15BOUS301

Max.Marks:CIA-25;ESE- 75

Credits : 3

Objectives: To acquire knowledge of medicinal plants, their medicinal uses and uses of various components of Traditional systems of medicine

UNIT – I

9 Hrs.

Green Revolution and Organic Farming - Introduction- Indian Agriculture before green revolution, advantages of green revolution- *Components of Organic Farming*.

UNIT – II

9 Hrs.

Green Manuring - Definition, Objectives- Classification of green manuring- Agronomy of green manure crops- Methods of application of green manure- *Future needs*.

UNIT – III

9 Hrs.

Indigenous Medicinal Systems of India - Ayurveda – Siddha – Homeopathy – *Unani* - Need to preserve the knowledge of the aforesaid systems.

UNIT – IV

9 Hrs.

Higher plants and their Medicinal Uses -Ocimum sanctum - Emblica officinalis - Aegle marmelos - Vinca rosea - Cissus quadrangularis - Piper betle and *Allium sativum*.

UNIT – V

9 Hrs.

Nutraceutical Fruits & Vegetables - Tomato – Carrot – Beetroot - Soya Bean – Pomegranate - Jamun and *Grapes*.

Note :*Italics* denotes Self Study Topics

TEXT BOOKS:

1. **Panda, H.**, “*Hand Book on Herbal Drugs and its Plant Sources*”, National Institute of Industrial Research, Delhi.
2. **Panda, H.**, “*Complete Technology Book on Herbal Perfumes and Cosmetics*”, National Institute of Industrial Research, Delhi.
3. **Gokhale, S.B, Kokale, C.K,Purohit, A.P.**,*Pharmacognosy* , NiraliPrakashan, Pune.

REFERENCE BOOKS :

1. **Acharya Vipul Rao** . “*Herbs that Heal*, Diamond Pocket Books , NewDelhi.
- 2.**Kokate, C.K, Purohit, A and Gokhale, S.R.**, “*Pharmacognosy*”, NiraliPrakashan, Pune, 43rd Edition, 2009.

SEMESTER-III

Non - Major Elective I - ORNAMENTAL HORTICULTURE

Instructional Hrs.: 30

Sub. Code : 15BOUN301

Max. Marks : ESE - 100

Credits : 2

Objectives: To understand the basic aspects of indoor and outdoor gardening. To know different types of ornamental plants and implements used in gardening. To develop the art of miniature plants and soil less culture.

UNIT – I **6 Hrs.**

Horticulture - Importance and scope –history - divisions of Horticulture - garden styles.

UNIT – II **6 Hrs.**

Elements of garden - Living elements – hedges, edges, lawn, arches, pergolas, topiary, trophy – garden adornments – fountains, statues -*Garden implements*.

UNIT – III **6 Hrs.**

Garden Plants - Annuals, biennials, perennials, climbers, special group of garden plants- succulents-and cacti- ornamental palms- bulbous plants- *orchids*.

UNIT – IV **6 Hrs.**

Indoor gardening - Terrarium- Bottle and Dish garden and *Hanging Basket*-Bonsai- Hydroponics- Vegetable and fruit carving.

UNIT – V **6 Hrs.**

Outdoor gardening - Rockery and water garden-*Kitchen garden* –Cut flowers-Flower arrangement – dry – fresh decoration and horticultural shows.

Note : *Italics* denote Self Study Topics

TEXT BOOKS:

1. **Kumar, N.**, "Introduction to Horticulture", Oxford and IBH, Publishing Co. Pvt. Ltd. NewDelhi, 2010
2. **Prasad, S. and Kumar, U.**, "*Principles of Horticulture*", Agro Botanica, India, Revised Edition, 1999.

REFERENCE BOOKS:

1. **George Acquaah.**, "*Horticulture Principles and practices*", Prentice-Hall of India PrivateLtd., 2nd Edition, 1973.
2. **Manibhushan Rao, K.**, "*Textbook of Horticulture*", Macmillan India Ltd., 2000.
3. **Dey, S.C.**, "Complete home gardening", Agrobios 2001.
4. **Chauhan, R. K.**, "Encyclopedia of General gardening for common people", Dominant publications and distributors, 2011.

SEMESTER - IV

Core Paper IV - CELL BIOLOGY AND TISSUE CULTURE

Instructional Hrs: 60 Sub. Code: 15BOUC404

Max. Marks: CIA – 25; ESE - 75

Credits: 4

Objectives: To study the structure and functions of Cell organelles. To know the mechanism of Gene expression and Protein synthesis. To know the techniques related to tissue culture.

UNIT – I

12 Hrs.

Cell Organelles - Structure and function of cell wall, Plasma membrane (Fluid mosaic model only) - Endoplasmic reticulum- Mitochondria and *Ribosome*.

UNIT – II

12 Hrs.

Cell Organelles - Chloroplast- Nucleus- Chromosome - *Dictyosomes* (Structure and functions only).

UNIT – III

12 Hrs.

Nucleic acids and Cell division - Structure and Replication of DNA. Structure and types of RNA- Protein synthesis - *Mitosis* and Meiosis.

UNIT – IV

12 Hrs.

Tissue culture Techniques - Basic requirements- Sterilization techniques- Media preparation – M.S. Medium. Cellular totipotency- Explants preparation and *Aseptic Manipulation*. Callus culture- Suspension culture- Organogenesis.

UNIT – V

12 Hrs.

Tissue culture Techniques - Protoplast isolation and culture- Meristem culture - Anther culture – Production of artificial seeds and its application.

Note: *Italics* denote Self Study Topics

PRACTICALS:

1. Study of mitosis using Onion root
2. Study of cell organelles through slides and photographs
3. Sterilization techniques
4. Preparation of M.S medium.
5. Callus culture

TEXT BOOKS:

1. **Arumugam, N.**, “*Cell Biology*”,Saras Publication, Kanyakumari Dt., Revised Edition, 2003.
2. **Verma, P.S.** and **Agarwal, V.K.**, “*Cytology*”, S. Chand & Company Ltd., New Delhi,
Revised Edition, 1983.

REFERENCE BOOKS :

1. **Dubey, R.C.**, “*A text book of Biotechnology*”, S. Chand & Company Ltd., New Delhi,
Revised Edition, 2009.
2. **Kumaresan,V**, “*Biotechnology*”, Saras publication, Nagercoil, Kanyakumari Dt., Revised
Edition 2009.
3. **Power, C.B.**, “*Cell biology*”, Himalaya Publishing House, Nagpur, Second Edition, 1977.

SEMESTER - IV

Skill Based Subject II - MULTI SKILL DEVELOPMENT PAPER

Instructional Hrs.: 45

Sub. Code:

13BOUS402

Max.Marks: CIA-40; ESE- 60

Credits : 3

Objectives : To equip the students with knowledge on all topics as desirable from the point of view of brilliant success in the competitive examinations. To familiarize the students with various types of tests that are employed by the diverse examining bodies.

UNIT – I

9 Hrs.

Communication - Question tag – Gerund and Infinitives – Spotting the errors – Vocabulary-Synonyms – Antonyms - Prepositions – Articles – One word substitution – Sentence completion.

UNIT- II

9 Hrs.

Numerical Aptitude - Problems on numbers - Problems on Ages – Percentage - Profit and loss - Ratio & Proportion - Time & Work - Time & Distance - *Simple Interest* - Compound Interest.

UNIT – III

9 Hrs.

Critical Reasoning - Logical Inference Questions and Syllogism. **Analytical Reasoning** - Arrangement problems – Family / Blood Relation Qualms – Sense of Directions – Age Doubts. **Verbal Reasoning** - Verbal Analogy (Letter series and number series only) – Coding and Decoding.

UNIT – IV

9 Hrs.

Presentation skills – Power Point Presentation on Algae in –Medicine- Food- Industry- Role of Fungi in Medicine- Industry- Cell Organelles- DNA structure and replication- Tissue culture techniques- Bacteria- Bacteriophage- Plant Diseases.

UNIT – V

9 Hrs.

Preparation of Resumes - Interview techniques – Verbal – Greeting- Speaking - Non- verbal – Movement- Posture- Gesture- Eye contact- Voice modulation- Dress code- Group discussion on Current affairs.

REFERENCE BOOKS :

1. **Prakesh, C.L.N**, “ *An advanced course in communication skills and Media Awareness*”, Cambridge University Press, India.
2. **Faculty of English**, PG and Research Department of English, Vellalar College of Women, Expressions – “*Interactive English communicative skills*”, Sre Sakthi Printers, Erode, 2007.
3. **Prasad, H.M**, “*How to prepare for group discussion and interview*”, Tata Mc graw Hill Publishing Company Ltd., 2011.
4. **AjaiBkher**, “*Group Discussion*”, Volire Publishers, New Delhi.

SEMESTER- IV

Non-Major Elective II - NURSERY AND LANDSCAPING

Instructional Hrs. : 30

Sub.Code : 15BOUN402

Max. Marks : ESE - 100

Credits : 2

Objectives : To acquire the aspects and perspectives on nursery and landscape gardening. To know the different kinds of nursery structures

UNIT – I

6 Hrs.

Nursery preparation- Introduction- scope – components of nursery- growing media for nursery plants - preparation of nursery beds - *Organic manuring*.

UNIT – II

6 Hrs.

Plant growing structures - *Pots and containers* - Nursery structures – Hot bed, Cold Frame, Green house, Lath house, Conservatory, Poly tunnels, Net house – Growth regulators in horticulture.

UNIT – III

6 Hrs.

Methods of Propagation - *Cutting–Layering–Simple, Compound and Air layering–Grafting–* Approach grafting ,Cleft grafting, Bud grafting (Outline only).

UNIT – IV

6 Hrs.

After care of plants - Transplantation–hardening, Pruning and thinning -Plant protection – disease causing organisms – *control measures*.

UNIT – V

6 Hrs.

Landscaping&designing -*Importance of garden* -landscape gardening- beauty components and principles-designing a garden- trees in landscaping.

Note : *Italics* denote Self Study Topics

TEXT BOOKS :

1. **Kumar, N.** Introduction to Horticulture, Oxford and IBH, Publishing Co. Pvt. Ltd. New Delhi, 2010.
2. **Prasad, S. and Kumar, U.,** "*Principles of Horticulture*", Agro Botanica, India, Revised Edition, 1999.

REFERENCE BOOKS :

1. **George Acquaah,** "*Horticulture Principles and practices*", Prentice-Hall of India Private Ltd., 2nd Edition 1973.
2. **Jitendra Singh,** "*Basic Horticulture*", Kalyani Publishers, New Delhi, Reprint, 2004.
3. **Manibhushan Rao, K.,** "*Textbook of Horticulture*", Macmillan India Ltd., 2000.
4. **Saini, R.S., Kaushik, N., Kanshik, R.A. and Godara, N.R.** Practical Nursery Production, Agrobios, 2006.

VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS), ERODE

B.Sc., DEGREE PRACTICAL EXAMINATION,

Model Question Paper Pattern

Core Practical – II PAPER III and IV

ANATOMY, EMBRYOLOGY, CELL BIOLOGY & TISSUE CULTURE

Hrs. : 3

Sub. Code : 15BOUCP02

Max. Marks : CIA – 40; ESE - 60

Credits : 4

I. Make suitable micro preparations of **A** and **B**. Draw labeled Sketches. Identify giving reasons and submit the slides for valuation. 2 x 7 = 14

II. Mount the Embryo of the given specimen **C**. Submit the slide for valuation. 6

III. Make a squash of the given specimen **D**. Identify any one stage, draw sketch and give reasons. 5

IV. Identify **E, F, G, H** and **I**. Draw sketches and write notes. 5 x 5 = 25

50

Record 10

Total 60

PRACTICAL – II
SCHEME OF VALUATION

I.	A – Anatomy – Primary/Secondary Structure	Identification	-	1
	B – Anatomy – Anomalous secondary growth	Slide	-	2
		Sketch	-	2
		Reasons	-	2
				$2 \times 7 = 14$
II.	C – Embryo Mounting	Identification	-	1
		Slide	-	4
		Sketch	-	1
				$1 \times 6 = 6$
III.	D – Mitosis	Identification	-	1
		Diagram	-	1
		Reasons	-	1
		Slide	-	2
				$1 \times 5 = 5$
IV.	E – Anatomy	Identification	-	1
	F – Embryology	Diagram	-	1
	G – Cell Biology	Reasons	-	3
	H - Medium / Synthetic seed / Sterilization Techniques			
	I - Tissue culture – Callus / Meristem / Anther			$5 \times 5 = 25$

				50
		Record		10

		Total		60

PG & RESEARCH DEPARTMENT OF BOTANY

B. Sc., Botany

Question Paper Pattern

CORE AND ELECTIVE PAPERS

Duration: 3.00 hrs

Marks: 75

Section – A

(10 × 1 = 10 marks)

Multiple Choice Questions – 10 (Two from each unit)

(Q. No 1 – 10)

Section – B

(5 × 5 = 25 marks)

Answer all the Questions(Either or pattern)

Two Question from each unit

(Q. No 11 – 15)

Section – C

(5 × 8 = 40 marks)

Answer **five** out of **eight** Questions

At least **One** Question from each unit

(Q. No 16 – 23)

ALLIED PAPERS

Question paper pattern similar to core paper. Mark distribution as follows.

Section - A

(10 × 1 = 10 marks)

Section Section – B

(5 × 3 = 15 marks)

Section – C

(5 × 6 = 30 marks)

SKILL BASED SUBJECTS

Paper- II Online Examination **60 Marks**. Internal evaluation **40 Marks**.

= 100 marks

Paper I, III, IV Five Questions out of **Eight(5 × 15 = 75 marks)**

SELF LEARNING PAPERS AND NON MAJOR ELECTIVE

Five Questions out of **Eight(5 × 20 = 100 marks)**

Self learning GK- Paper- Online evaluation

– 100 Marks

SELF LEARNING SUBJECT

Paper III - PRESERVATION TECHNIQUES

Sub.Code : 13BOUSL03

Max. Marks : ESE - 100

Credits:5

Objectives: To study the importance of food and preservation techniques. To discern the microbes used in food products. To analyse the disease causing organisms.

UNIT – I

Food spoilage and preservation processes – Intrinsic factors- extrinsic factor- food preservation alternatives.

UNIT – II

Diseases and foods – food borne diseases and water borne diseases.

UNIT – III

Fruit preservation techniques – Fresh fruits and fruit products.

UNIT – IV

Vegetable preservation techniques – Pickles- dry products.

UNIT – V

Microbiology of fermented foods - Dairy products - meat- fish and alcoholic beverages (wine).

TEXT BOOKS:

1. **Power, C.B.**, “*Microbiology*”, Vol. II, Himalayan Publishing House, Mumbai, First Edition, 1996.
2. **Manibhushan Rao, K.**, “*Text book of Horticulture*”, Macmillan India Ltd., Madras, 1995.

REFERENCE BOOKS:

1. **Giridharital, Siddappa, G.S. and Tandon G.L.,**“*Preservation of Fruits and Vegetables*”
CFTRI, Mysore, 2001.
2. **Manorajan Kalia & Sangita** “*Food, Food preservation and Processing*” Department of
Food Science and Nutrition, College of Home Science. Himachal Pradesh, Agri University,
Palampur, 2000.
3. **Prescott & Klein,** “*Microbiology*”, AUS Publishing, New Delhi, First Edition, 1983.

Vellalar College for Women (Autonomous), Erode - 12.

Bachelor of Science in Botany

2013 - 2014 Onwards

Course Content and Scheme of Examinations (CBCS Pattern)

Semester V

Part	Study Components	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	Max. Marks			Credits
						CIA	ESE	Total	
III	Core	13BOUC505	Paper V Taxonomy of Angiosperms & Economic Botany	5	3	25	75	100	4
		13BOUC506	Paper VI Plant Physiology	5	3	25	75	100	4
		13BOUC507	Paper VII Phytochemistry	4	3	25	75	100	4
			Practical- III Papers V, VIII, IX & XII	7					
	Elective I	13BOUE501	Paper I Applied Microbiology	3	3	25	75	100	4
	Elective II	13BOUE502	Paper II Fundamentals of Computer & Bioinformatics	3	3	25	75	100	4
IV	Skill Based Subject III	13BOUS503		3	3	25	75	100	3
Total								600	23

Semester VI

III	Core	13BOUC608	Paper VIII Ecology & Phytogeography	4	3	25	75	100	4
		13BOUC609	Paper IX Genetics, Plant Breeding & Biostatistics	4	3	25	75	100	4
		13BOUC610	Paper X Biotechnology I - Concepts & Techniques	4	3	25	75	100	4
		13BOUC611	Paper XI Biotechnology II – Applied Biotechnology	4	3	25	75	100	4
		13BOUC612	Paper XII Horticulture	4	3	25	75	100	4
			Practical –IV Papers VI, VII, X & XI	6					
			Elective Practical-I Paper I & II	2					
		13BOUCP03	Practical -III Papers V, VIII, IX & XII (Exam)		3	40	60	100	4
		13BOUCP04	Practical- IV Papers VI, VII, X & XI (Exam)		3	40	60	100	4
		13BOUEP01	Elective Practical-I Paper I & II (Exam)		3	40	60	100	4

IV	Skill Based Subject IV	13BOUS604		3	3	25	75	100	3
V	Extension activity NCC/NSS/Physical education/YRC/ Green Society							100	1
Total								1000	35
Grand Total (I to VI Semester)								4000	140

Vellalar College for Women (Autonomous), Erode - 12.		
Bachelor of Science in Botany		
2013 - 2014 Onwards		
Course Content and Scheme of Examinations (CBCS Pattern)		
SKILL BASED SUBJECTS		
S.No.	Subject Code	Title of the Paper
1	13BOUS301	Herbs and Health (Cafeteria)
2	13BOUS402	Multi Skill Development Subject*
3	13BOUS503	Herbal Cosmetics & Ayurvedic Medicines (Cafeteria)
4	13BOUS604	Mushroom Technology (Cafeteria)
BASIC TAMIL / ADVANCED TAMIL/ NON MAJOR ELECTIVES		
S.No.	Subject Code	Title of the Paper
1	09TMLU301	Basic Tamil*
	09TMLU401	
2	09ADTU301	Advanced Tamil**
	09ADTU401	
3	13BOUN301	Nursery Management
	13BOUN402	Home Gardening
* For Students whose Part I in secondary education is not Tamil		
** For Students whose Part I in Higher secondary education is not Tamil		
SELF LEARNING SUBJECT		
S.No.	Subject Code	Title of the Paper
1	13AUGSL05	General Awareness (Optional)
2	13BOUSL03	Preservation Techniques (Optional)
*Online examination for three units for a maximum of 60 marks.		
Units IV & V are CIA for a maximum of 40 marks.		

SEMESTER – V
Core Paper – V
TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY

Ins. Hrs. : 75

Sub. Code : 13BOUC505

Max. Marks : CIA- 25; ESE -75

Credits: 4

Objectives : To identify the families of the plants in the theory syllabus. To identify medicinally and economically important plants and plant products.

UNIT – I

15 Hrs.

Descriptive terms used in taxonomy - *stem- leaf-* inflorescence- flower fruit. Systems of classification – Natural - (Bentham and Hooker)- Modern – (Takhtajan) (outline only).

UNIT – II

15 Hrs.

Herbarium techniques and uses- Nomenclature - ICBN-Priority - Typification- Effective and Valid publication- *Author citation*.

UNIT – III

15 Hrs.

A detailed study of the following families Systematic position- Description and the *economic importance of the types* and pollination mechanisms wherever applicable. Annonaceae- Capparidaceae- Sterculiaceae- Rutaceae- Myrtaceae- Curcubitaceae- Apiaceae.

UNIT – IV

15 Hrs.

Rubiaceae-Asclepiadaceae-Convulvulaceae-Scrophulariaceae-Acanthaceae-Verbenaceae-*Lamiaceae*.

UNIT - V

15 Hrs.

Amarantaceae- Euphorbiaceae- Moraceae- Orchidaceae -Liliaceae- Arecaceae and *Poaceae*.**Note : Italics denote Self Study Topics**

PRACTICALS:

1. Taxonomic studies of selected plant species included in the families mentioned in the theory.
2. Study of economic products of the plants belonging to the families mentioned.
3. Students should submit 20 herbarium sheets at the time of Practical examinations.
4. Field trip for 5 days to study vegetation and for specimen collection.

REFERENCE BOOKS:

1. **Lawrence- G.H.M**, “ *Taxonomy of Vascular plants*”, Oxford and IBU Publishing Co. Pvt.. Ltd., New Delhi, 1951.
2. **Pandey, B.P**, “ *Taxonomy of Angiosperms*”, S. Chand & Company Ltd. 1982, New Delhi.
3. **Pandey, B.P**, “ *Economic Botany*”, S. Chand & Company Ltd., New Delhi, 2007.
4. **Saxena, N.B. and Saxena, S**, “ *Plant Taxonomy*”, Pragati Prakashan, Revised Edition, 2001.
5. **Singh, V. and Jain, D.K**, “ *Taxonomy of Angiosperms*”, Rastogi Publications, Second Edition, 2004.

SEMESTER – V

Core Paper - VI

PLANT PHYSIOLOGY

Ins. Hrs. : 75

Sub. Code : 13BOUC506

Max. Marks : CIA 25; ESE -75

Credits:4

Objectives :To understand the water relationships with Plant system. To understand the metabolic activities of plants. To understand the enzymes involved in various metabolic activities. To understand the energy relationships in various metabolic activities.

UNIT - I

15 Hrs.

Water relationships of plant – Diffusion- Osmosis – Osmotic pressure- Turgor pressure- Osmotic potential- *Imbibition- Plasmolysis* -absorption of water and mineral salts- Translocation of water solutes and assimilates.

UNIT - II

15 Hrs.

Transpiration- Kinds of transpiration- Mechanism of stomatal transpiration- Factors affecting stomatal movement. Plant growth regulators – Auxin- Gibberellin- *Cytokinin*

UNIT – III

15 Hrs.

Physiology of flowering – Photoperiodism- Phytochrome- Vernalization.Plant movements - *Circadian rhythms in plants.*

UNIT - IV

15 Hrs.

Phytosynthesis - Out line of chloroplast apparatus and *Photosynthetic pigments*- Light of dark reaction – Carbon fixation : C₄ and CAM.

UNIT - V

15 Hrs.

Respiration: Glycolysis- Kreb's cycle- Electron transport system and *oxidative phosphorylation.*

Note : Italics denote Self Study Topics

REFERENCE BOOKS:

1. **Arthur C. Giese** , “*Cell Physiology*”, Toppan Company Ltd.Tokyo, Japan, Fifth Edition, 1979.
2. **Frank B. Salisbury** and **Cleon W. Ross**, “*Plant Physiology*”, CBS Publisher and Distributors, New Delhi, Third Edition, 1996.
3. **Gill, P.S.**, “*Plant Physiology*”, S. Chand and Company Ltd., New Delhi, 2001.
4. **Jain, V.K.**, “*Fundamentals of Plant Physiology*”, S. Chand and Company Ltd, 1990.
5. **Jayaraman, J**, “*Laboratory Manual in Bio-chemistry*”, New Age International (P) Ltd. Publishers, New Delhi, 2008.
6. **Ray Noggle, G.** and **George J. Fritz**, “*Introduction to Plant Physiology*”, Prentice – Hall of India Pvt Ltd., New Delhi, 1986.
- 7.**Rober M. Devlin**, “*Plant Physiology*”, Lifton Educational Publishing INC, New York , Third Edition, 1979.
8. **Verma, S.K.**, “*A Text book of Plant Physiology and Biochemistry*”, S. Chand and Company, New Delhi.

SEMESTER -V

Core Paper - VII

PHYTOCHEMISTRY

Ins. Hrs. : 60

Sub. Code : 13BOUC507

Max. Marks : CIA 25; ESE - 75

Credits: 4

Objectives : To understand structure and properties of Biomolecules, secondary metabolites and free radicals. To study the principles and working mechanism of Instruments.

UNIT- I

12 Hrs.

Atoms- Molecules- Ionic bond- Covalent bonds- Hydrogen bonds- Acids and Bases- Solutions- pH and *Buffer system*.

UNIT- II

12 Hrs.

Enzymes :*Classification*- properties- mode of action- factors affecting enzyme activity. Bio molecules - Outline of structure- classification and properties of carbohydrates.

UNIT- III

12 Hrs.

Outline of structure- Classification and properties of Amino acids- Nitrogen metabolism- Protein and *Lipids*.

UNIT- IV

12 Hrs.

Study of secondary metabolites – Polyphenolics - Terpenoids and Alkaloids. Free radicals – Types- Scavenging activity.

UNIT-V

12 Hrs.

Principles and working mechanism of pH - Centrifuge- Calorimetry- Spectrometry and Chromatography – Paper and Thin layer.

Note : *Italics denote Self Study Topics*

PRACTICALS :

1. Determination of Osmotic Pressure of the cell sap of the given specimen (Rheo leaf).
2. Rate of respiration in flower buds/germinated seeds using simple Respiroscope (Demonstration only).
3. Separation of leaf pigments by Paper chromatography and TLC (Thin Layer Chromatography).
4. Measurement of the rate of photosynthesis under varying condition of CO₂ concentration.
5. Effect of light intensity on O₂ evolution during photosynthesis.
6. Effect of light intensity of transpiration (Demonstration only).
7. Determining the rate of transpiration using Ganong's Potometer.
8. Determination of water absorption and transpiration ratio (Demonstration only).
9. Estimation of protein and carbohydrates (Demonstration only)

REFERENCE BOOKS :

1. **Arthur C. Giese** , "*Cell Physiology*", Toppan Company Ltd., Tokyo, Japan, Fifth Edition, 1979.
2. **Jain , J.L.**, "*Fundamentals of Bio-chemistry*", S. Chand and Company Ltd., New Delhi, 2001.
3. **Jayaraman, J.** , "*Laboratory Manual in Bio-chemistry*", New Age International (P) Ltd., Publishers, New Delhi, 2008.
4. **Robert M. Devlin**, "*Plant Physiology*", Lifton Educational Publishing INC, New York , Third Edition, 1979.
5. **Verma, S.K.**, "*A Text book of Plant Physiology and Biochemistry*", S. Chand and Company, New Delhi.

SEMESTER - V

Elective - I

APPLIED MICROBIOLOGY

Ins. Hrs. : 45

Sub. Code : 13BOUE501

Max. Marks : CIA 25; ESE -75

Credits : 4

Objectives: To install necessary skills on fermentation process, isolation, identification and production of microbes used in industry. To understand culture and application of microbes in Agriculture.

UNIT – I

9 Hrs.

Fermentation – Kinds of fermentation – Batch, Fed-Batch and Continuous culture-Fermentation media– Sterilization - methods of sterilization – physical and chemical sterilization- Advantages.

UNIT – II

9 Hrs.

Soil Microbiology – types of microorganism in soil- Microorganism and plant growth- factors affecting microbial growth. Air microbiology – Role of Microorganism in air- *Methods of purification.*

UNIT – III

9 Hrs.

Microbiology of water – microorganism in water purification- *determination of sanitary quality.*
Microbiology of sewage and treatment – Primary- Secondary- Tertiary and Vermicomposting.

UNIT – IV

9 Hrs.

Food Microbiology – Composition of milk - Pasteurization - Dairy products – Manufacture of cheese- Microbial flora of fresh food. Microbial examination of foods – food poisoning- *Botulism.*

UNIT – V

9 Hrs.

Industrial Microbiology - Manufacture of Ethanol – Streptomycin - Vitamin B₁₂–*Glutamic acids*– Citric acid.

Note : Italics denote Self Study Topics

PRACTICALS :

1. Gram staining
2. Sterilization Techniques
3. Preparation of culture media for bacteria and fungi
4. Preparation of agar streak
5. Antibacterial activity
6. Enumeration of bacterial colonies from soil by serial dilution method
7. Enumeration of bacterial colonies from Air
8. Biological waste treatment of water
9. Microbial flora of fresh food
10. Production of Antibiotic - Streptomycin

REFERENCE BOOKS :

1. **Casida, JR. L.E.**, "*Industrial Microbiology*", New Age International (P) Ltd. Publishers, New Delhi, Revised Edition, 2000.
2. **Gerald Reed, Prescott and Dunn's**, "*Industrial Microbiology*", CBS Publishers & Distributors, New Delhi, Fourth Edition, 1987.
3. **Lechtman, M.D.**, "*Microbiology*", Macmillan Publishing Co. London, 1976.
4. **Pelzar, M.J., Reid, R.D and Chan, E.C.S**, "*Microbiology*", Tata Mc Graw Hill, 1983.
5. **Prescott, A. and Dunns**, "*Industrial Microbiology*", AVS Publishing, Revised Edition, 1983.
6. **Purohit, S.S.**, "*Microbiology Fundamentals & Applications*", Mrs. Saraswathi Purohit for Student Edition, India, Sixth Edition, 2005.

SEMESTER –V

Elective - II

FUNDAMENTALS OF COMPUTER AND BIOINFORMATICS

Ins. Hrs. : 45

Sub. Code : 13BOUE502

Max. Marks : CIA 25; ESE - 75

Credits : 4

Objectives: To study the capabilities of an electronic magic machine-the computer.
To acquire the knowledge of worldwide collection of computer networks. To acquire the knowledge of Drug locking.

UNIT – I

9 Hrs.

Introduction to computer – Components of Computer - Capabilities of Computer – Hardware and Software – Input - Output devices - Operating System -*Computer applications.*

UNIT –II

9 Hrs.

Microsoft Office - M.S Word - Creation of documents – Excel - Spread sheet- workbook *charts and table-* Power Point presentation - Access – Creating a database.

UNIT – III

9 Hrs.

Introduction to Internet – Data communication concepts – WWW - E- mail- Smiley- Service Provider – Internet addressing (Domine IP) - Net Browser- search engine - *News groups.*

UNIT – IV

9 Hrs.

Bioinformatics – Types of Database – Nucleotide sequence Database – NCBI - GENBANK- EMBL. Protein Sequence Database – SWISS-PROT- Literature Database – Pub Med - AGRICOLA- *Virtual library* - Data Mining.

UNIT – V

9 Hrs.

Gene finding algorithm and tools for sequence analysis – Protein Prediction - Similarity Search - Phylogenetic analysis –*Drug Designing.*

Note : Italics denote Self Study Topics

PRACTICALS:

1. Creating, editing and printing a document in MS - word.
2. Preparation of worksheet in Microsoft Excel.
3. Creating a database in Microsoft access.
4. Web browsing.
5. E-mailing.
6. Gene finding.

REFERENCE BOOKS :

1. **Arthur M. Lesk**, "*Introduction to Bioinformatics*", Oxford University Press, First Edition, New Delhi, 2003.
2. **Attwood, T. K. and Parry Smith, D.J.**, "*Introduction to Bioinformatics*", Pearson Education Ltd., Fifth Edition, New Delhi, 2003.
3. **Irfan A. Khan and Atiya Khanum**, "*Emerging trends in Bioinformatics*", Ukaaz Publications, First Edition, Hyderabad, 2002.
4. **Mani, K., and Vijayaraj, N.**, "*Bioinformatics for beginners*". Kalaikathir Achchagam, Coimbatore, First Edition, 2002.
5. **SundaraRajan, S. and Balaji, R.**, "*Introduction to Bioinformatics*", Himalaya Publishing Housing, First Edition, Mumbai, 2002.

SEMESTER - V
Skill Based Subject - III
HERBAL COSMETICS AND AYURVEDIC MEDICINES

Instructional Hrs. : 45

Sub. Code : 13BOUS503

Max. Marks : CIA – 25; ESE - 75

Credits : 3

Objectives: To study the application of medicinal plants. To study the recipes for herbal refreshments and remedial plants for common diseases.

UNIT – I **9 Hrs.**

Ethnic people of India – Wild edible and medicinal plants used by Ethnic people of Himalayas- Assam- Kerala and *Tamil Nadu*.

UNIT – II **9 Hrs.**

Herbal home remedies – Skin diseases- Skin care compounds- Skin pigmentation- *Memory power intelligence* and Kidney stone.

UNIT – III **9 Hrs.**

Traditional drugs as laxative- Cardiotonics- Anti-diabetics- Antiseptics and *Anti-malaria*.

UNIT – IV **9 Hrs.**

Herbal Cosmetics: Oral products- Tooth paste- Cosmetics for bath products- Bath oil, Bath soap- Hair care herbal products –Hair shampoo, Hair dye.

UNIT – V **9 Hrs.**

Perfumes – Rose- Jasmine- Lilac- Magnolia and Narcissus.

Note : *Italics* denote Self Study Topics

REFERENCE BOOKS:

1. **Arumugam, KR and Muruges, N.**, “*Text Book of Pharmacognosy*”, Sathya Publishers, Madurai, Reprinted, 2008.
2. **Handa, S.S and Kapoor, V.K.**, “*Pharmacognosy*”, Vallabh Prakashan, Delhi, Second Edition, 2003.
3. **Kokate, C.K, Purohit, A and Gokhale, S.R.**, “*Pharmacognosy*”, NiraliPrakashan, Pune, 43rd Edition, 2009.
4. **Kumar, N.C.**, “*An Introduction to Medical Botany and Pharmacognosy*”, Emkay Publications, New Delhi, 1993.
5. **Wallis, T.E.**, “*Text book of Pharmacognosy*”, CBS publishers and distributors, Delhi, First Edition, 1985.
6. **Gokhale, S. B., Kokate,C.K, and Purohit, A** “*Pharmacognosy*”, NiraliPrakashan, Pune, Sixteenth Edition, 2002.
7. **Handa, S.S and Kapoor, V.K.**, “*Pharmacognosy*”, Vallabh Prakashan, Delhi, Revised Edition, 1993.
8. **Panda, H.**, “*Herbal perfumes and Cosmetics*”, National Institute of Industrial Research, Delhi.
9. **Panda, H.**, “*Herbal Cosmetics*” -Handbook, Asia Pacific Business Press Inc. Delhi.

SEMESTER –VI

Core Paper – VIII

ECOLOGY AND PHYTOGEOGRAPHY

Ins. Hrs. : 60

Sub. Code : 13BOUC608

Max. Marks : CIA 25;ESE - 75

Credits: 4

Objectives : To enable the students to acquire knowledge about the environment and to identify the environmental problems. To facilitate the students to find out remedial solutions.

UNIT- I

12 Hrs.

Ecological factors: Principles- Role of climatic - edaphic - Biotic factors on plants – Kinds and Structure of Ecosystem - Biogeochemical cycles (*Nitrogen - Carbon*).

UNIT - II 12 Hrs.

Autecology– Ecological life history of species- Characteristics of Population- Dispersal and migration - Synecology – Vegetation – Units of Vegetation - Methods of studying vegetation – Quadrat- *Belt and Line transect*.

UNIT – III 12 Hrs.

Ecological Adaptations - Hydrophytes –Mesophytes- Xerophytes – *Halophytes*- Morphological and Anatomical features in relation to their habitats.

UNIT – IV 12 Hrs.

Plant Distribution – Factors affecting distribution- Concept of Barriers - Continental drift – Endemism - Major and Minor biomes of the world - Plants and Plant communities as indicators.

UNIT – V 12 Hrs.

Plant geography – Principles and vegetational types of India – Tropical rain forest - Sholas and deciduous forest – Sand dunes - Scrub jungle - *Phytogeographical regions of India*.

Note : *Italics denote Self Study Topics*

PRACTICALS:

1. Study of morphological and anatomical adaptations of hydrophytes, xerophytes, including halophytes and mesophytes using representative samples.
2. Determination of frequency and density constituent of plant species in a terrestrial community through Quadrat and Transect (line, belt).
3. Phytogeographical regions of India.

REFERENCE BOOKS:

1. **Eugene P. Odum** , “*Fundamentals of Ecology*”, W.B Saunders company, Philadelphia and London, Third Edition, 2005.
2. **Sharma P.D.**, “*Ecology & Environment*”, Rastogi Publications, Meerut, Eleventh Edition, 2005.
3. **Shukla, R.S, Chandel,P.S.**, “*A text book of plant Ecology Including Ethnobotany and soil science*”,S.Chand& company Ltd. New Delhi, First edition, 2003.
4. **Vasishta. P.C.**, “*A text book of Plant Ecology*”, Vishal Publications, NewDelhi, Second Edition, 1979.
5. **Verma, P.S. and Agarwal,V.K.**, “*Environmental Biology*”, S. Chand & Company Ltd, New Delhi, Fourth edition. 1993.
6. **Subrahmanyam, N.S. andSambamurthy, A.V.S.S.** “*Ecology*”, Narosa Publishing House Pvt. Ltd. Second edition, 2006.

SEMESTER -VI

Core Paper – IX

GENETICS, PLANT BREEDING AND BIOSTATISTICS

Instructional Hrs. : 60

Sub. Code : 13BOUC609

Max. Marks : CIA 25; ESE - 75

Credits: 4

Objectives : To study the basics of Mendelian genetics. To understand the mechanism of gene expression and regulation. To understand the concept of mutation. To know the skills and methods involved in plant breeding.

UNIT- I

12 Hrs.

Mendelism and Interaction - Monohybrid - Dihybrid Cross - Back Cross - Test cross - Incomplete dominance -- Complementary – Supplementary and *Duplicate*.

UNIT- II

12 Hrs.

Classical Genetics - Linkages and Crossing over - multiple alleles - blood groups in man -- Sex determination in plants- *Meiosis* - Cytoplasmic inheritance (plastid only)

UNIT-III

12 Hrs.

Mutation and Gene Regulation– Types of mutation - Somatic mutation- Physical and chemical mutagens – Polyploidy - genetic code - gene regulation in prokaryotes – *Operon concept*.

UNIT-IV

12 Hrs.

Plant breeding – *Objectives* – methods of selection (Mass - Pureline and Clonal) - Hybridization methods- Hybridization techniques - Hybrid vigour.

UNIT- V

12 Hrs.

Biostatistics – Collection of data - Sampling types - Measures of Central tendency - *Arithmetic Mean*- Median. Measures of Dispersion- Range- Coefficient of Range- Standard deviation and Standard error (only theory).

Note : Italics denote Self Study Topics

PRACTICALS:

1. Study of Meiosis.
2. Observation of Charts for Mendelian ratios. Gene interaction and linkage. Simple problems in genetics.
3. Simple problems in Mean, Median, Mode in Biostatistics. Standard deviation, Standard error.

REFERENCE BOOKS:

1. **Allard, R.W**, "*Principles of plant breeding*", John Wiley & sons, INC. Singapore, 2000.
2. **Rama Krishnan, P**, "*Biostatistics*" Saras Publications, Nagercoil, First Edition, 2001.
3. **Sharma, J.R**, "*Principles and Practice of Plant breeding*", Tata MCG raw-Hill publishing Company Ltd., New Delhi, 1994.
4. **Singh, J. R**, "*Plant breeding principles and methods*", Kalyani Publishers, Ludiana, Seventh Edition, 2008.
5. **Verma, P. S., Agarwal, V.K**, "*Genetics*", First Edition , S. Chand & Company Ltd, New Delhi, 2002.

SEMESTER – VI

Core Paper –X

BIOTECHNOLOGY I – CONCEPTS AND TECHNIQUES

Ins. Hrs. : 60

Sub. Code : 13BOUC610

Max. Marks : CIA 25; ESE - 75

Credits: 4

Objectives : To know the outlines of genetic engineering. To develop the skill on gene transfer methods. To understand the applications and the uses of various bio molecules separation techniques. To study the extraction and separation of enzymes used in industries.

UNIT- I

12 Hrs.

Biotechnology – Biotechnology and its branches – Scope – Applications of Genetic Engineering- Enzymes used in gene cloning – DNA Polymerases- Restriction endonucleases - Ligases and *Reverse transcriptase*.

UNIT- II

12 Hrs.

Cloning vectors – Plasmids - Transposons and YAC –*CaMV* - Methods of Gene cloning – Preparation of desired genes - Isolation of DNA vector - Construction of Recombinant DNA- Introduction of Recombinant DNA into the Host cell - Selection and Multiplication of recombinant host cells - Expression of Cloned Gene.

UNIT- III

12 Hrs.

Gene Cloning Strategies -Methods of direct gene transfer – Electrophoration – *Microinjection*- Liposome fusion - Gene cloning in higher plants – use of *Agrobacterium Ti*-Plasmid as vehicle -

UNIT - IV

12 Hrs.

Techniques in biotechnology - Application and uses of PCR - DNA finger printing - Southern and Western blotting techniques - *Agarose gel electrophoresis*.

UNIT - V

12 Hrs.

Enzyme technology – Extraction- separation and purification of enzymes - Immobilization- methods -*Application of enzymes*.

Note : Italics denote Self Study Topics

REFERENCE BOOKS:

1. **Balasubramanian, P.**, Bryce, CFA., Dharmalingam, K. Green,J., Kunthala Jayaraman
“*Concepts in biotechnology*”, Universities press India Pvt. Ltd., Hyderabad, 2004.
2. **Dubey, R.C.**, “*A text book of Biotechnology*” ,S.Chand& Company Ltd, New Delhi, Third Edition, 2004.
3. **Gupta, P.K.**, “*Elements of Biotechnology*”, Rastogi publications – Meerut first edition, 2004.
4. **Joshi, P.**, “*Genetic Engineering and its Applications*”, Student Edition Jodhpur, 2000.
5. **Kumaresan, V.**, “*Biotechnology*”, Saras Publications, Nagercoil, 2009.
6. **Purohit, S.S., Mathur, S.K.**, “*Biotechnology Fundamentals & Applications*”, Agro botanical Publishers India, 1996.
7. **Purohit, S.S.**,” *Bitechnology Fundamentals & Applications*” Mrs. Saraswathi Purohit for student Edition, India, Third Edition, 2005.
- 8.**Razdan, M.K.**, “*Introduction to plant tissue culture*” , Oxford & IBH publishing Co. Pvt. Ltd., Second Edition, New Delhi, 2008.
- 9.**Trevan, M.D., Boffey, S., Goulding, K.H., Stanbury, P.**, “*Biotechnology the Biological principles*”, Tata McGraw-Hill publishing company Ltd., New Delhi, 1996.

SEMESTER – VI

Core Paper – XI

BIOTECHNOLOGY II –APPLIED BIOTECHNOLOGY

Ins. Hrs. : 60

Sub. Code : 13BOUC611

Max. Marks : CIA 25; ESE - 75

Credits: 4

Objectives : To understand the application of genetic manipulation in Agriculture, Food, Medicines, Biopesticides. To study Bioprocess Technology and their applications.

UNIT - I

12 Hrs.

Food Technology – SCP as microbial food for future - Mass cultivation and nutritional value of Spirulina- *Scenedesmus*, *Yeast and Bacteria* (*Methylophilus*) - Mushroom Technology – Cultivation techniques and nutritional value of *Pleurotussajor-caju* – *Agaricusbisporous*.

UNIT - II

12 Hrs.

Biofertilizers – Advantages of mass cultivation and application technique of *Rhizobium-Azospirillum*- Blue Green Algae (Nitrogen Fixers)- *Phosphobacteria*- *Azolla* and VAM.

UNIT - III

12 Hrs.

Application of genetic engineering - Agriculture (transgenic plants) –*Biological control of pathogens through engineered microbes- Bacillus thuringiensis* - Medicine - Insulin- Vaccines- Gene therapy - Monoclonal antibodies and Hybridoma techniques.

UNIT - IV

12 Hrs.

Biotechnology in pollution control – Xenobiotic Compounds – Radioactive wastes- Bioremediation - Phytoremediation – Bioleaching – Biosorption – Bioplastics.

UNIT - V

12 Hrs.

Biofuels -BioEthanol- BioDiesel - Biogas production - Methane - BioHydrogen production - *Petrochemical plants* - Plant biomass - Types- Composition - Biomass energy.

Note : Italics denote Self Study Topics

PRACTICALS:

1. Cultivation of Pleurotus sajor-caju and Agaricus bisporous
2. Culture of Yeast and Azolla.
3. Demonstration of Biofertilizers – Azospirillum- Agrobacterium – Slides or photographs.
4. Blotting techniques –Photographs.
5. Petrochemical plants – Materials / Photographs
6. Biogas production - Photographs.

REFERENCE BOOKS:

1. **Balasubramanian, P.**, Bryce, CFA., Dharmalingam, K. Green, J., Kunthala Jayaraman , “*Concepts in biotechnology*”, Universities Press India Pvt. Ltd., Hyderabad, 2004.
2. **Dubey, R.C.**, “*A text book of Biotechnology*” ,S.Chand& Company Ltd, New Delhi, Third Edition, 2004.
3. **Gupta, P.K.**, “*Elements of Biotechnology*”, Rastogi publications – Meerut first edition, 2004.
4. **Joshi, P.**, “*Genetic Engineering and its Applications*”, Student Edition Jodhpur, 2000.
5. **Kumar, H.D.**, “*Modern Concepts of Biotechnology*”, Vikas publishing house Pvt. Ltd., 2001.
6. **Kumaresan, V.**, “*Biotechnology*”, Saras Publications, Nagercoil, 2009.
7. **Purohit, S.S.**,” *Bitechnology Fundamentals & Applications*” Mrs. Saraswathi Purohit for student Edition, India, Third Edition, 2005.
8. **Trevan, M.D., Boffey, S., Goulding, K.H., Stanbury, P.**, “*Biotechnology the Biological principles*”, Tata McGraw-Hill publishing company Ltd., New Delhi, 1996.

SEMESTER - VI

Skill Based Subject- IV

MUSHROOM TECHNOLOGY

Ins. Hrs. : 45

Sub. Code : 13BOUS604

Max. Marks : CIA 25; ESE - 75

Credits: 3

Objectives: To exploit and cultivate non – traditional food resource rich in protein. To make a substantial breakthrough to meet the food deficit. To discern the nutritional and medicinal value of mushrooms.

UNIT – I

9 Hrs.

Biodiversity of mushrooms- Influence of climatic factors-Importance of mushroom cultivation.-
Morphology of Edible Mushrooms - Production of spawn.

UNIT – II

9 Hrs.

Cultivation - white button mushroom- Oyster Mushroom and *milky mushroom*- Giant mushroom- Black ear mushroom.

UNIT – III

9 Hrs.

Cultivation - paddy straw mushroom- Silver ear mushroom and Winter mushroom- Species of edible mushroom and *inedible mushroom*.

UNIT – IV

9 Hrs.

Management of diseases- pests and weed fungal attacks- Production of Vermicompost from spent Mushroom bed- Post harvest technology- Food preparation.

UNIT – V

9 Hrs.

Nutritive and Medicinal Value of Mushroom - *Uses of Mushroom* – Advantages of Mushroom. Preparation of compost.

Note : Italics denote Self Study Topics

REFERENCE BOOKS:

1. **Nita Bahl**, “*Handbook on Mushrooms*”, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi & Kolkata, 2002.
2. **Robin Gogoi, YellaRathaiah and Tasvina Rahman Borah**, “*Mushroom cultivation Technology*”, Scientific Publishers, India, 2006.
3. **Kumaresan, V.**, “*Biotechnology*”, Saras Publications, Nagercoil, 2009.
4. **Dubey, R.C.**, “*A text book of Biotechnology*”, S.Chand & Company Ltd, New Delhi, Third Edition, 2004.
5. **Subrata Biswas, Datta, M, and Ngachan, S.V.** “*Mushrooms – A manual for Cultivation*”, PHI Learning Pvt. Ltd.. 2012.

VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS), ERODE

B.Sc., DEGREE PRACTICAL EXAMINATION,

Core Practical – III

PAPERS V, VIII & IX

**Taxonomy of Angiosperms & Economic Botany, Ecology and Phytogeography, Genetics,
Plant Breeding and Biostatistics**

Hrs. : 3

Sub.Code : 13BOUCP03

Max. Marks : CIA – 40; ESE - 60

Credits : 4

I.	Assign specimen A to its respective family giving reasons	6	
II.	Describe specimen B in technical terms. Draw sketches of floral parts. Construct floral diagram and write floral formula.	6	
III.	Assign the specimen C to its respective habitat by giving the morphological and anatomical adaptations.	4	
IV.	Analyze the plant communities present in the constructed belt / quadrat / line transect D by quantitative method. Present the data and give the inference.	6	
V.	Write the family, binomial and the morphology of the useful part in E, F & G	9	
VI.	Workout the given problems H&I	8	
VII.	Write notes on J, K & L	6	

		45	
	Herbarium	5	
	Record	10	

	Total	60	

PRACTICAL – III
SCHEME OF VALUATION

I. A - Taxonomy	Identification	2	
	Reasons	4	6
II. B - Taxonomy	Sketches	2	
	Floral Diagram	1	
	Floral Formula	1	
	Description	2	6
III. C - Ecology - Xerophytes / Hydrophytes	Habitat	1	
	Adaptation	2	
	Sketches	1	4
IV. D - Quadrat /Belt /Line	Identification	1	
	Data	3	
	Inference	2	6
V. E, F & G - Economic Botany	Family	1	
	Genus, Species	1	
	Morphology of useful part 1		3x3 = 9
VI. H & I - Genetics Problems -Interaction of factors /Mendelism			2x4 = 8
VII. J - Plant Breeding			
K - Phytogeographical Regions of India			
L – Ecology - Halophyte / Pneumatophore/ Continental drift			3x2 = 6

			45
Record	10		
		Herbarium	5

		Total	60

VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS), ERODE

B.Sc., DEGREE PRACTICAL EXAMINATION,

Core Practical – IV

PAPERS VI, VII, X & XI

**Plant Physiology, Phytochemistry, Biotechnology - Concepts And Techniques &
Applied Biotechnology**

Hrs. : 3

Sub. Code : 13BOUCP04

Max. Marks : CIA – 40; ESE - 60

Credits : 4

- I. Take slip from the lot **A & B**. Write down the requirements for the experiments given in the slip. Give the procedure and set up the experiments.

Leave the set up for valuation. **20**

- II. Comment on the given set up **C10**

- III. Write notes on **D,E, F, G & H20**

50

Record **10**

Total **60**

PRACTICAL – IV
SCHEME OF VALUATION

I. A - Physiology	Procedure	- 3
B - Biochemistry	Data, inference & Results	- 5
	Set up	- 2

2x10 = 20

II. C - Physiology / Biochemistry set ups
(Demonstration Experiments) **10**

III. D - Biochemistry

E - Physiology

F - Biofertilizers -Azospirillum/ Azolla

G - MS medium

H - Blotting techniques – Western/Southern **5 x 4 = 20**

	50
Record	10

Total	60

VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS), ERODE

B.Sc., DEGREE PRACTICAL EXAMINATION,

Elective Practical – I

PAPER I & II

Applied Microbiology and Fundamentals of Computer and Bioinformatics

Hrs. : 3

Sub. Code : 13BOUEP01

Max. Marks : CIA – 40; ESE - 60

Credits : 4

- I. Stain the bacterial culture **A** by gram staining method and identify the type of bacteria. Write the procedure and submit the slide for valuation **10**
- II. Write down the algorithm for the given practical of **B & C.** **20**
- III. Write notes on **D, E, F, G & H.** **20**

50

Record **10**

Total **60**

ELECTIVE PRACTICAL – I

PAPER I & II

SCHEME OF VALUATION

I.	A – Gram staining	Procedure	5	
		Identification	1	
		Slide	3	
		Sketch	1	10

II. **B – Algorithm of M.S Word/ M.S Excel/ M.S Power point.**

C - Algorithm of Gene Finding/Protein prediction. **2x10 =20**

III. **D& E – Autoclave /Hot air oven/Inoculation needle/Laminar airflow/Culture medium/ Agar streak**

F& G - Components of computer – Mouse/Keyboard/CPU/ Monitor.

H - Bioinformatics – Data base- NCBI/AGRECOLA/ SWISS PROT/ Pub Med

Identification	1		
		Diagram	1
		Notes	2
			5x4 = 20

50

Record **10**

Total **60**

PG & RESEARCH DEPARTMENT OF BOTANY

B. Sc., Plant Biology and Plant Biotechnology

Question Paper Pattern

CORE AND ELECTIVE PAPERS

Duration: 3.00 hrs

Marks: 75

Section – A

(10 × 1 = 10 marks)

Multiple Choice Questions – 10 (Two from each unit)

(Q. No 1 – 10)

Section – B

(5 × 5 = 25 marks)

Answer all the Questions(Either or pattern)

Two Question from each unit

(Q. No 11 – 15)

Section – C

(5 × 8 = 40 marks)

Answer **five** out of **eight** Questions

At least **One** Question from each unit

(Q. No 16 – 23)

ALLIED PAPERS

Question paper pattern similar to core paper. Mark distribution and follows.

Section - A (10 × 1 = 10 marks) Section – B

(5 × 3 = 15 marks)

Section – C

(5 × 6 = 30 marks)

SKILL BASED SUBJECTS

Paper- II Online Examination **60 Marks**. Internal evaluation **40 Marks**. = **100 marks**

Paper I, III, IV Five Questions out of **Eight(5 × 15 = 75 marks)**

SELF LEARNING PAPERS AND NON MAJOR ELECTIVE

Five Questions out of **Eight(5 × 20 = 100 marks)**

Self learning GK- Paper- On line evaluation

– 100 Marks

SELF LEARNING SUBJECT

Paper – III

PRESERVATION TECHNIQUES

Sub.Code : 13BOUSL03

Max. Marks : ESE - 100

Credits:5

Objectives: To study the importance of food and preservation techniques. To discern the microbes used in food products. To analyse the disease causing organisms.

UNIT – I

Food spoilage and preservation processes – Intrinsic factors- extrinsic factor- food preservation alternatives.

UNIT – II

Diseases and foods – food borne diseases and water borne diseases.

UNIT – III

Fruit preservation techniques – Fresh fruits and fruit products.

UNIT – IV

Vegetable preservation techniques – Pickles- dry products.

UNIT – V

Microbiology of fermented foods - Dairy products - meat- fish and alcoholic beverages (wine).

REFERENCE BOOKS:

1. **Giridharital, Siddappa, G.S. and Tandon G.L.**, “*Preservation of Fruits and Vegetables*”
CFTRI, Mysore, 2001.
2. **Manibhushan Rao, K.**, “*Text book of Horticulture*”, Macmillan India Ltd., Madras, 1995.

3. **Manorajan Kalia & Sangita** “*Food, Food preservation and Processing*” Department of Food Science and Nutrition, College of Home Science. Himachal Pradesh, Agri University, Palampur, 2000.
4. **Power, C.B.**, “*Microbiology*”, Vol. II, Himalayan Publishing House, Mumbai, First Edition, 1996.
5. **Prescott & Klein**, “*Microbiology*”, AUS Publishing, New Delhi, First Edition, 1983.