BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI – 620 024.

B.Sc. Plant Biology and Plant Biotechnology Course Structure under CBCS

(For the candidates admitted from the academic year 2010-2011 onwards)

Semester	Part	Course	Title	Instru Hours/ Week	Credit	ExamHours	Marks		Total
							Int.	Extn.	
I	I	Language Course – I (LC) – Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course-I(ELC)		6	3	3	25	75	100
	III	Core Course – I (CC)	Algae, Fungi, Bacteria, Virus, Lichens & Plant Pathology	5	5	3	25	75	100
		Core Course – II (CC)	Practical I – Covering the Core Courses I & III	3	-	***	-	-	-
		Core Course – III (CC)	Bryophytes, Pteridophytes and Palaeobotany	2	-	***	-	-	-
		First Allied Course –I (AC)	-	5	4	3	25	75	100
		First Allied Course – II (AC)	Practical	3	-	***	-	-	-
				30	15				400
II	I	Language Course – II (LC) - – Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course–II (ELC)		6	3	3	25	75	100
		Core Course – II (CC)	Practical I-Covering the Core Courses I & III	3	4	3	40	60	100
	III	Core Course – III (CC)	Bryophytes, Pteridophytes and Palaeobotany	3	5	3	25	75	100
		First Allied Course – II (AC)	Practical	2	2	3	40	60	100
		First Allied Course – III (AC)	--	5	4	3	25	75	100
	IV	Environmental Studies		3	2	3	25	75	100
	IV	Value Education		2	2	3	25	75	100
				30	25				800
III	I	Language Course – III (LC) – Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course-III (ELC)		6	3	3	25	75	100
	III	Core Course – IV (CC)	Gymnosperms, Anatomy and Embryology	**6**	5	3	25	75	100
		Core Course – V (CC)	Practical II–Covering the Core Courses IV & VI	**3**	-	***	-	-	-
		Second Allied Course – I	.	5	4	3	25	75	100
		Second Allied Course – II	Practical	2	-	***	-	-	-
		Non Major Elective I - for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree programme	Biofertilizers & Biopesticides	2	2	3	25	75	100
				30	17				500
IV	I	Language Course –IV (LC) - Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course – IV (ELC)		6	3	3	25	75	100

	III	Core Course – V (CC)	Practical II–Covering the Core Courses IV & VI	2	3	3	40	60	100
		Core Course – VI (CC)	Principles of Biotechnology	5	5	3	25	75	100
		Second Allied Course - II	Practical	2	2	3	40	60	100
		Second Allied Course - III		5	4	3	25	75	100
	IV	Non Major Elective II - for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree programme	Horticulture	2	2	3	25	75	100
		Skill Based Elective I		2	**4**	3	25	75	100
				30	**26**				800
V	III	Core Course – VII (CC)	Cell and Molecular Biology	5	5	3	25	75	100
		Core Course – VIII (CC)	Genetics & Evolution	5	5	3	25	75	100
		Core Course – IX (CC)	Morphology, Taxonomy & Economic Botany	5	5	3	25	75	100
		Core Course – X (CC)	Practical III covering the core courses VII, VIII & IX	6	4	3	40	60	100
		Major based Elective – I	Medical Botany	5	5	3	25	75	100
	IV	Skill based Elective –II		2	**4**	3	25	75	100
		Skill based Elective – III		2	**4**	3	25	75	100
				30	**32**				700
VI	III	Core Course – XI (CC)	Plant Physiology, Biochemistry & Biophysics	**6**	5	3	25	75	100
		Core Course – XII (CC)	Plant Ecology and Phytogeography	**6**	5	3	25	75	100
		Core Course – XIII (CC)	Practical IV – Covering the Core Courses XI & XII	6	4	3	40	60	100
		Major based Elective II	Biostatistics and Computer Applications in Botany	**6**	5	3	25	75	100
		Major based Elective III	Microbiology	**5**	4	3	25	75	100
	IV	Extension activities		-	1	-	-	-	-
		Gender Studies		1	1	3	25	75	100
				30	25				600
			Total	180	140				3800

Note:

	Internal Marks	**External Marks**
1. Theory	25	75
2. Practical	40	60

3. Separate passing minimum is prescribed for Internal and External marks
   The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]
   The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

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CORE COURSE I
ALGAE, FUNGI, BACTERIA, VIRUS, LICHENS & PLANT PATHOLOGY

Unit I: ALGAE

General Account of the following:

a. Classification of Algae (Fritsch)
b. Range of Thallus Organization, Pigmentation
c. Types of life Cycles
d. Economic importance of Algae
e. Algal Biofertilizers

Unit II: Detailed Study of the following::

a. Chamydomonas
b. Volvox
c. Chlorella
d. Cladophora
e. Cosmarium
f. Caulerpa
g. Chara
h. Diatoms (Pennate & Centric)
i. Sargasssum
j. Polysiphonia
k. Nostoc
l. Oscillatoria

Unit III: Fungi – General Account of the following:

a. Classification of fungi (Ainsworth 1973)
b. Mycorrhiza Types and their role in agriculture
c. Economic importance of fungi

Diseases caused by fungi (Plant Pathology)

a. Blast disease of Tice
b. Red rot of sugarcane
c. Tikka disease of groundnut

Unit IV: Structure and Reproduction of the following:

a. Plasmodiophora
b. Pythium
c. Albugo
d. Schharomyces
e. Eurotium
f. Peziza
g. Puccinia
h. Lycoperdon

Unit V: Lichens:

Classification, structure and reproduction of Lichens

Bacteria
Structure, Nutrition and reproduction
Asexual: Binary fission and Endospore
Sexual: Conjugation in bacteria, citurs cancer

Virus

Nature, structure (TMV and bacteriophage)
Biosynthesis, transmission and virus disease

Reference:

1. A text book of Algae – B.R. Vashista
2. A text book of Algae – S.K. Srivastava
3. Text book of Botany Vol. I – Saxena & Sarabai
4. Text book of Algae – B.P. Pandey

CORE COURSE II – PRACTICAL – I

[Covering the Core Course I and III]

Detailed study of the types mentioned in the theory.

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CORE COURSE III – Bryophytes, Pteridophytes and Palaeobotany

Unit I

Bryophytes:

General Account of the following:

A. Classification of Bryophytes (Smith)
B. Range of thallus structure in Bryophytes
C. Vegetative reproduction in Bryophytes
D. Ecology of Bryophytes

Unit II

Detailed study of the following

A. Riccia
B. Marchantia
C. Porella
D. Anthoceros
E. Funaria

Unit III

Pteridophytes

General account of the following

A. Classification of Pteridophytes (Reimer)
B. Stelar types and their evolution in Pteridophytes
C. Heterospory and seed habit
D. Apogamy and Apospory

Unit IV

Detailed study of the following

A. Psilotum
B. Lycopodium
C. Selaginella
D. Equisetum
E. Adiantum
F. Marsilea

Unit V

Paleobotany

General account of the following

A. Geological time scale
B. Fossils and methods of fossilization

Detailed account of the following

A. Rhynia
B. Lepidodendron
C. Lepidocarpon
D. Calamites

REFERENCE:

BRYOPHYTES

Cavers, Frank ( ) : The inter-relationships of the Bryphytes
New Phytologist, Indian Reprint. Pp.,

Smith, G.M. (1955) : Cryptogamic Botany Vol. II. (2nd Edition)
(Bryophytes & Pteridophytes)
Tata McGraw Hill Publishing Co., New Delhi-399pp.,

Parihar, N.S. ( ) : An Introduction to embryophyta – Vol.II. Bryophyta
Central Book Depot., Allahabad.- pp.,

Chopra, G.L. (1968) : A Class Book of Bryophyta
Hari Singh & Bros., Julunder-248pp.,

Watson, E.V. (1968) : British Mosses & Liverworts
Cambridege University Press, U.K. 465pp.,

Dublish, P.K. &
Agarwal, D.K. (1973) : A Text Book of Bryophyta
Rajeeva Prakashan, Meerut, India-288pp.,

Jeyaraman (1978) : "Indiyavin liverwortugal" (In Tamil)
Tamil Nadu Text Books society, Madras-250pp.,

Prem Puri (1981) : Bryophytes: Morphology, Growth and differentiation
Atma Ram & Sons., Delhi, Lucknow –310pp.,

Vashista, B.R. (1983) : Botany for Degree students-Bryophyta
S.Chand & Co., New Delhi-392pp.,

Chopra, R.N. &
Kumara, P.K. (1988) : Biology of Bryophytes
Wiley Eastern Ltd., New Delhi, Bangalore, Bombay,
Calcutta, Hyderabad, Madras-340 pp.,

Palaniyappan, S. (1988) : Bryophyta (In Tamil)
T.K. Publishing House, Chennai - 174pp.,

Srivastava, N.N. (1996) : Bryophyta
Pradeep Prakashan, Meerut-India-215 pp.,

Rashid, A. (1998) : An Introduction to Bryophyta
Vikas Publishing House (P) Ltd., New Delhi-298pp.,

Chopra, R.N. (Ed.,) (1998) : Topics in Bryology
Allied Printers (P) Ltd., New Delhi, Mumbai, Calcutta,
Lucknow, Chennai, Nagpur, Bangalore, Hyderabad,
Ahmedabad – 202p.,

Chopra, R.N. &
P.K. Kumara (1988) : Biology of Bryophytes
Wiley Eastern Ltd., New Delhi, Bangalore, Bombay,
Calcutta, Hyderabad, Madras – 320pp.,

Practical : A study of both vegetative and reproductive structures(wherever available) of Genera included in the theory.

PTERIDOPHYTES

Eames, A.J. (1936) : Morphology of Vascular Plants (Lower Groups)
McGraw Hill, N.Y. pp.,

Parihar, N.S. (19) : An Introduction to Embryophyta Vol.II Pteridophyta

Central Book Depot., Allahabad.

Smith, G.M. (1955) : Cryptogamic Botany Vol.II (2nd Edn.,) (Bryophytes & Pteridophytes) Tata McGraw Hill Publishing Co., New Delhi-399pp.,

Sporne, K.R. (1970) : The Morphology of Pteridophytes (The Structure of Ferns and Allied Plants) Hutchinson University Library, London-192pp.,

Bierhorst, D.W. (1971) : Morphology of Vascular Plants The MacMillan Co., N.Y. & Collier-MacMillan Ltd., London, 560 pp.,

Sharma, O.P. (1990) : Textbook of Pteridophyta MacMillan India Ltd., Delhi, Madras,Patna, Jaipur, Vapi, Bangalore, Hyderabad, Lucknow, Trivandrum, Guwahati, Coimbatore, Cuttack, Bhopal-359pp.,

Sundara Rajan, S. (1994) : Introduction to Pteridophyta New Age International Publishers Ltd., Wiley Eastern Ltd., New Delhi, Bangalore, Bombay, Calcutta,Guwahati, Hyderabad, Lucknow, Madras, Pune, London-318pp.,

Vashista, P.C. (1997) : Botany for Degree Students-Pteridophyta. S. Chand & Co., New Delhi, 501 pp.,

Rashhed, A. (1999) : An Introduction to Pteridophyta Vikas publishing Co., New Delhi,426pp.,

PALEOBOTANY

Arnold, C.A. (1947) : An Introduction to Paleobotany McGraw Hill Book Co., N.Y.-431pp.,

Seward, A.C. (1959) : Plant Life Through the Ages Hafner Publishing Co.,N.Y. 603pp.,

Scott, D.H. (1962) : Studies in Fossil Botany (Vol.I & Vol.II) Hafner Publishing Co., N.Y. 442 & 446pp.,

Delavoryas, T. (1962) : Morphology and Evolution of Fossil Plants Holt, Rinehart & Winston, N.Y. Chicago, San Francisco, Toronto, London-189pp.,

Shukla, A.C. & Misra, S.P. (1975) : Essentials of Paleobotany Vikas Publishing House (P)Ltd., Delhi,Bombay, Kanpur 383pp.,

Stewart, W.N. (1983) : Paleobotany & the Evolution of Plants Cambridge University Press, Cambridge, London, N.Y., New Rochelle, Melbourne, Sydney-405pp.,

Venkatachala, B.S., Shukla , M.& Sharma, M. (1992) : Plant Fossils-a Link with the Past (A Birbal Sahni Birth Centenary Tribute) Birbal Sahni Institute of Paleobotany, Lucknow, India-63pp.,

Practical :

A study of the Morphogy and anatomy of both vegetative and reproductive parts of the living genera and fossil forms wherever available.

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CORE COURSE IV – GYMNOSPERMS, ANATOMY AND EMBRYOLOGY

GYMNOSPERMS

Unit I

Classification, (Reimer's)
Structure and Reproduction of Cycas and Gnetum
Economic importance of Gymnosperms

ANATOMY

Unit II

Plant tissue	Classification, Simple and Complex tissues Meristems – Classification, Distribution and theories (Apical cell theory, Histogen theory and Tunica Carpus theory)
Tissue Systems	Epidermal, Ground and Vascular tissue system,

Unit III

Secondary thickening	Primary structure of dicot and monocot stem, Root and Leaf
(normal)	Dicot stem and Root, Pits, Annual rings, heart wood and sap wood, Tyloses, Apotrachial and paratracheal and callose, Periderm formation
Anomalous Secondary Thickening	Boerheevii, Nyclinathes, Abnormal position and behavior of Cambium, Accessory cambium, Extrastelar cambium and Inter xylery phloem with suitable examples
Secondary thickening In Monocot	Eg. Dracaena

EMBRYOLOGY

Unit IV

Microsporangium	Structure, microsporogenesis and development of male-gametophyte
Megasporangium	Structure, Types of ovules and megasporogenesis – Detailed study of monosporic (Polygonum type) Bisporic (Allium type) and Tetrasporic (Peperomia type) Embryo sac. Double Fertilization and its significance
Unit V	
Endosperm	Nuclear, Cellular & Helobial endosperms, Ruminate endosperm and Haustoria Embryo: Development of Dicot embryo (Capsella bursapastoria) Monocot embryo (Luzula forsteri) Polyembryony and apomixes

Reference:

1. Ganguly & Dutta, College Botany Vol- II
2. Pandey B.P. 1972, Plant anatomy, S. Chand & Co. New Delhi
3. John Jothi prakash E. Plant anatomy, Emkay Publications New Delhi
4. Pandey B.P. Embryology of Angiosperms
5. Dwividi, J.N. 1986, Embryology of Angiosperms, Rastogi & Co., Meerut
6. Maheswari P. 1974, an introduction to Embryology of Angiosperms Mc Graw Hill Co., New york
7. Sporne, K.R. 1962, Morphology of Gymnosperms Hutchinson University Library
8. Dutta, S.c. 1979, An introduction to Gymnosperms Bishen singh & Mehidra pal singh Publishers, Dehradun
9. Esau. K. 1974, Anatomy of seed plants john Wiley & sons New Delhi
10. Fahn, A. 1988, Plant Anatomy, Pergamon press, Oxford U.K.
11. Bhojwani S.s. & Bhatnagar Sp. 2000, The Embryology of Angiosperms (4^{th} Revised Ed.,) – Vikas Pub., House, New Delhi

CORE COURSE V–PRACTICAL II–COVERING THE CORE COURSES IV& VI

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NON MAJOR ELECTIVE I - BIOFERTILIZERS AND BIOPESTICIDES

Unit I

Biofertilizers – Definition, kinds of microbes as biofertilizers, Rhizobium-legume Symbiotic association – mass cultivation and carrier materials.

Unit II

Cultural method of Azospirillum, Azotobacter, Azolla and anabaena, carrier materials.

Unit III

Mycorrhiza - VAM association, types, isolation and inoculum production.

Unit IV

Pesticides – Introduction – Biological Magnification concept. Biopesticides – Viral origin, fungal origin

Unit V

Biopesticides – Bacterial origin , Bacillus thuringiensis mechanism of action and application. Advantages of Biopesticides and Commercialization

Reference:

1. Subba Rao, N.S. 2000 Soil Microbiology. Oxford and IBH Publishing Co. Ltd.
2. Verma A and Hock B. 1995. Mycorrhiza. ISBN
3. Yaacovokan, 1994 - Axospirillum, CBC press.
4. Wicklow, D.T. and B.E. Soderstrom. 1997, Environmental and microbial relationships.. Springer ISBN.

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CORE COURSE VI – PRINCIPLES OF BIOTECHNOLOGY

Unit I

Scope and importance – Application of biotechnology in industry, agriculture and medicine, future impacts of biotechnology

Unit II – Genetic engineering

Aims – Techniques – Restriction enzymes (Endonucleases and ligases) – Gene cloning procedures – Isolation of DNA to be cloned – Vectors: - Plasmid; isolation of plasmids – Transformation and growth of cell - Selection and identification of clones (use of markers, colony hybridization) – Expression of cloned genes

Unit III – Immuno Technology and Enzyme Engineering

Immuniglobuims – Types and structures – Hybridoma technology (Monoclonal antibodies) – Genetic engineering for vaccine production

Unit IV – Tissue Culture

Techniques; (Explants, sterilization, preparation of M. S. medium) induction of callus, growth and differentiation. Application of tissues culture technology in agriculture. Protoplast isolation and somatic hybridization, synthetic seeds

Unit V – Applications of Biotechnology

a) Single cell protein – Spirulina
b) Mycoprotein – Yeast
c) Hydrogen production – Cyanobacteria
d) Biogas – Water hyacinth and Salvinia

Reference :

1. Dubey. R.C.a. (1996) Text Book of Biotechnology
2. Gupta P.K. Biotechnology
3. Bilgrami. K.S. (1992) Introduction to Biotechnology
4. Pandey, A.K. CBA Publishers, New Delhi
5. Kalyan Kumar D.e. (1992) Plant tissue culture, New Central Book Agency, Calcutta
6. Ignacimuthu Rev> Fr. S. Basic Biotechnology
7. Purohit - Biotechnology

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NON MAJOR ELECTIVE II – HORTICULTURE

Unit I

Horticulture :- Importance and scope of Horticulture, Classification of horticultural crops – fruits, vegetables crops, climate, soil, water, nutrition needs of horticultural crops,

Unit 2

Plant propagation methods, cutting, layering, grafting, budding, stock-seion relationship. Use of plant regulators in horticulture .

Unit 3

Garden designs, types of gardens – formal, informal and kitchen garden, units of garden, hedge, border, popiary arches and lawn maintenance. –

Unit 4

Floriculture, cultivation of commercial flowers – rose and jasmines . Cultivation of important fruit trees – Mangoes and Banana.

Unit 5

Green house, Indoor gardening – Bonsai – flower arrangements – nursery management and maintenance

REFERENCES

Bose, T.K. & Mukherjee, D. (1972) : Gardening in India
Oxford & IBH Publishing Co., Kolkatta, Mumbai, New Delhi-385pp.,

Sandhu, M.K. (1989) : plant Propagation
Wiley Eastern Ltd.,New Delhi, Bangalore, Bombay, Calcutta, Madras, Hyderabad, Pune-287pp.,

Lex Lauries & Victor H. Rice- (1950) : Floriculture – fundamental and practices.
McGraw Hill Publishers, N.Y.

Kumar , N. (1997) : Introduction to Horticulture
Rajalakshmi Publications, Nagercoil, India-
(28 Chapters & approx. 300pages)

Naik ( ) South Indian Fruits and their culture
Vardhachary & Co., Madras.

Edmond Musser & Andres ( ) : Fundamentals of Horticulture
McGraw Hill Book Co.,

Gardener ( ) : Basic Horticulture
Mac Millan, N.Y.

Randhawa ( ) : Ornamental Horticulture in India
Today & Tomorrow Publishers, New Delhi

Sundararajan, J.S.
Muthuswamy, J. ( ) : A guide to horticulture
Shanmugavelu, K.G.
Balakrishnan, R. Thiruvenkadam Printers, Coimbatore.

CC VII – CELL AND MOLECULAR BIOLOGY

Unit I

Structure of Prokaryotic and eukaryotic cells – Ultra structure of cell organcelles – Plastids, Mitochondria, Golgibody, ER microbodies – peroxisomes and glyoxysomes – Lysosome – Ultra structure and functions of plasma membrane

Unit II

Nucleus – Nucleolus – Structure of euchromatin and hetrochromatin, Special types of chromosomes – Lamp brush chromosome and polytene chromosome – mitosis, meiosis, Cell cycle and stages – Protein synthesis – an overview

Unit III

Genetic material – Properties and replication of genetic material – Structure – Hershey & Chase experiment. C- value paradox – organization of DNA sequences – Satellite DNA, repetitive DNA sequences

Unit IV

Bacterial genome: Transcription and its control in prokaryotes, initiation, elongation and termination. DNA supercoilicy (positive and negative)gene regulation in prokayate & Eukaryetes

Unit V

Chloroplast and mitochondrialgenome – Semi autonomous organization, Receptors, Signal transduction pathway prokin phosphorlation

Practical for Cell and Molecular Biology

1. Observation of plant cells in the onion peeling and Theo leaf
2. Non-living inclusions: Raphides, cystolith and Starch grains
3. Cell division: Mitosis and Meiosis – Squash technique in onion toot tips and Tradescantia / Rheo flower bud respectively
4. Isolation of cell organelles through differential centrifugation
5. photographs: Ultra Structure

Books for Study:

1. Sharma N.S. 2005, Molecular Cell Biology, International Book distributors, Dehradun
2. Verma P.S. and Agarwal V.K. 1986, Cell Biology and Molecular Biology (Cytology) S. Chand and Company, New Delhi

Books for Reference:

1. Old, R.W. and Primrose S.B. 1994, Principles of Gene Manipulation Blackwell Science, London
2. Grierson, D. and Convey S.N. 1989, Plant Molecular Biology, Blackie Publishers, New York
3. Lea, P.J. and Leegood R.C. 1999, Plant Biochemistry and Molecular Biology, John wiley and sons, London
4. Power C.B., 1984, Cell Biology, Himalaya Publishing Co. Mumbai
5. De. Robertis and De Robertis, 1998, Cell and Moleceular Biology, K.M. Verghese and Company

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CC – VIII- GENETICS & EVOLUTION

Unit I

Genetics-Monohybrid and Dihybrid Ratios(Mendel's Laws). Deviation from mendelian ratio: Incomplete dominance (Mono-and dihybrid), lethal factor, complementary factor and epistasis (dominant), Multiple factor Hypothesis, multiple alleles-Blood groups.

Unit II

Linkage, crossing over, recombination, cytological proof of crossing over, mapping of genes on the chromosomes, sex linkage-Drosophila (eye colour) and humans(colour blindness), cytoplasmic inheritance.

Unit III

Sex determination in Drosphila, humans and plants – changes in chromosome structure, number and behaviour, their genetic effects, polyploidy, types.

Unit IV

Biochemical genetics of Neurospora, Gene action. Gene units-cistron,recon, Muton, codon and operon. Gene mutation, physical and chemical mutagens. Mutation rate –its role in evolution.

Unit V

Evolution-Evolutionary concepts in explaining the diversity of life. Theories of Lamarck, Charles Darwin, and the modern synthetic theories.

REFERENCES

GENETICS

Sinnott, E.W., L.C. Dunn & J. Dobshansky (1958) : Principles of Genetics(5th Edition) McGraw Hill Publishing Co., N.Y. Toronto, London-459pp.,

Winchester, A.M. (1958) : Genetics(3rd Edition) Oxford & IBH Publishing House, Calcutta, Bombay, New Delhi-504pp.,

Singleton, R. (1963) : Elementary Genetics D. Van Nostrand Co., Ltd., Inc., N.Y. & Affiliated East West Press (P) Ltd., New Delhi-482pp.,

Chandrasekaran, S.N. & Parathasarathy , S.V. (1965) : Cytogenetics and Plant Breeding P. Varadhachari & Co., Madras-655pp.,

Strickberger, M.W. (1976) : Genetics(2nd Edition)
MacMillan Publishing Co., Inc., N.Y., London
-914pp.,

Herskowitz, I.H. (1977) : Principles of Genetics(2nd Edition)
MacMillan Publishing Co., Inc., N.Y.
& collier-Macmillan, London-836pp.,

Hexter, W. &
H.T. Yost(Jr) (1977) : The Science of Genetics
Prentice hall of India(P)Ltd.,New Delhi-596pp.,

Watson, J.D. (1977) : Molecular Biology of the Gene
W.A. Benjamin, Inc., Menlo Park-California,
Reading-Massachusetts, London, Amsterdam,
Don Mills, Ontario, Sydney-739pp.,

Srb, A.M. Owen,R.D. &
Edgar, R.S. (1979) : General Genetics
Eurasia Publishing House(P)ltd., New Delhi-557pp.

Gardner, E.J. &
Snusted, D.P. (1984) : Principles of Genetics(7th edition)
John Wiley & Sons, N.Y. Chichester, Brisbane,
Toronto, Singapore-400pp.,

Lewin, B. (1985) : Genes IV
Wiley Eastern Ltd., New Delhi, Bombay, Calcutta,
Madras, Hydrabad-716pp.,

Dnyansagar, V.R. (1986) : Cytology & Genetics
Tata McGraw Hill Publishing Co., Ltd., New Delhi
-403pp.,

Palaniyappan, S. (1987) : Marabiyal (Genetics-In Tamil)
V.K. publishing House, Madras-152pp.,

Sinha, U.& Sinha, S. (1989) : Cytogenetics, Plant Breeding & Evolution
Vikas publishing House, New Delhi-408pp.,

Ahluwalia, K.B. (1990) : Genetics
Wiley Eastern Ltd.,New Delhi, Bangalore,Bombay,
Calcutta, Madras, Hydrabad –372pp.,

Sandhya Mitra (1994) : Genetics-A Blue Print of Life
Tata McGraw Hill Publishing Co., Ltd., New Delhi-
1052pp.,

Sarin, C. (1994 : Genetics
Tata McGraw Hill Publishing Co.,Ltd.,New Delhi-
528pp.,

Renganathan, T.K. & Shanmugavel, S. (1996) : Genetics & Genetic Engineering Commercial Offset Printers, Sivakasi, India-107+72pp.,

Winter, P.C ., Hickey, G.I. & Fletcher, H.L. (1999) : Instant Notes in Genetics Viva Books (P)Ltd., New Delhi, Mumbai, Chennai-342pp.,

Jain, H.K. (1999) : Genetics-Principles, Concepts & Implications Oxford & IBH Publishing Co., (P) Ltd., New Delhi-454pp.,

Meyyan, R.P., (2000) : Genetics & Evolution Saras Publication, Nagercoil, India-380pp.,

Gupta, P.K. (2000) : genetics Rastogi Publishers, Meerut, India-611pp.,

Agarwal., V.K. (2000) : Simplified course in Genetics(B.Sc., Zoology) S. Chand & Co.,New Delhi-168pp.,

Daniel Sundararaj, D. & G. Thulsidas (1972) : Introduction to Cytogenetics & Plant Breeding (3rd edition) Popular Book Depot., Madras-361pp.,

EVOLUTION

Savage, J.M. (1969) : evolution (2nd Edition) Amarind Publishing Cosec$^2\theta$ (P)Ltd., New Delhi, Bombay, Calcutta, N.Y.-152PP.,

Gottlieb, LD. & Jain, S.K. (1988) : Plant Evolutionary Biology Chapman & Hill, London, N.Y-414pp.,

Shukla, R.S. & P.S Chandel (1996) : Cytogenetics, Evolution & Plant Breeding S. Chand & Co., New Delhi-560pp.,

Verma, P.S. & V.K . Agarwal (1999) : Concepts of Evolution S. Chand & Co., New Delhi-148pp.,

Anna Sproule (1998) : Charles Darwin Scientists who have changed the world Orient Longmans, Hydrabad-64pp.,

Practicals : Problems on simple monohybrid and dihybrid ratios. Simple problems on interaction on factors included in the theory.

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CC –IX - MORPHOLOGY, TAXONOMY & ECONOMIC BOTANY

Unit I

Morphology - Inflorescence - types- racemose, cymose, mixed and special types. Descriptive terminology of flower and floral parts.
Fruit-classification. Details of simple , fleshy,dry dehiscent and dry indehiscent, aggregate and multiple fruits.

Unit II

Taxonomy:- Binomial nomenclature. Systems of classification-Bentham & Hooker and Engler & Prantl. Merits and Demerits of their systems. Herbarium Techniques.

Unit III

A detailed study of the following families and their Economic Importance- Annonaceae, Capparidaceae, Tiliaceae, Rutaceae, Anacardiaceae, Leguminosae, (Paplionoideae (Fabaceae) Caesalpinoideae (Caesalpiniaceae) & Mimosoideae (Mimosaceae) Cucurbitaceae, Apiaceae,

Unit IV

Rubiaceae, & Asteraceae. Apocyanaceae, Asclepiadaceae, Solanceae, Convolvulaceae, Acanthaceae, Verbeneaceae, Amarantaceae, Euphorbiaceae, Orchidaceae, Liliaceae and Gramineae (Poaceae).

Unit V

Economic Botany :- A brief study of the following Economic Plants and their main economic importance products:-

(1) Food –Cereals (Oryza, Eleusine); Pulses- (Phaseolus) , Edible oil-Seasamum; Root tubers Manihot; Sugar –Saccharum.

(ii) Fibres-Textiles(Gossypium);Others-Crotolaria, Agave.

(iii) Medicinal plants -Ocimum, Phyllanthus, Solanum.

(iv) Forest products – Timber (Teak,Jack).Tannins, Gums, Resins, Turpentine.

REFERENCES

TAXONOMY

Porter, C.L. ( ) : Taxonomy of flowering Plants
Eurasia Publishing House, New Delhi.

Lawrence, G.H.M. (1953) : Taxonomy of Vascular Plants
Oxford & IBH Publishers, New Delhi, Calcutta-823pp.,

Mitra, J.N. (1964) : An Introduction to Systematic botany & Ecology
The World Press (P) Ltd., Calcutta –694pp.,

Jefferey, C. (1968) : An Introduction to Plant Taxonomy
J.A. Churchill, London-142pp.,

Mathur, R.C. (1970) : Systematic Botany (Angiosperms)
Agra Book Stores-Lucknow, Ajmer, Allahabad,Delhi,
Kanpur, Meerut, Varanasi – 520pp.,

Ramaswami, S.N.,
S.Lakshminarayana &
V.Venkateswaralu (1976) : Taxonomy (Systematic Botany) for degree course
Maruthi Book Depot, Guntur, Hyderabad –312pp.,

Narayanaswamy, R.V.
& Rao, K.N. (1976) : Outlines of botany
S. Viswanathan Printers & Publishers, Chennai-31-983 pp.,

Singh, V. &
D.K. Singh (1983) : Taxonomy of angiosperms
Rastogi Publications, Meerut, India-564pp.,

Sivarajan V.V. (1993) : Introduction to the Principles of Plant Taxonomy
(2nd Edn.,) (N.K.P. Robson(Ed.,) Oxford & IBH
publishing Co., New Delhi-292pp.,

Gurcharan Singh (1999) : Plant Systematics _Theory & Practice
Oxford & IBH Publishing Co., (P)Ltd.,
New Delhi370pp.,

Pandey, B.P. (1997) : Taxonomy of Angiosperms
S. Chand & Co., (P)Ltd., New Delhi-600pp.,

Naik, V.N. (1996) : Taxonomy of Angiosperms(9th Edition)
Tata McGraw Hill Publishing Co., (P)Ltd.,
Delhi-304pp.,

Vashista, P.C. (1997) : Taxonomy of Angiosperms
S. Chand & Co., New Delhi, Jullunder 884pp.,

Subramaniyan, N.S. (1999) : Laboratory Manual of Plant Taxonomy (2nd Edition)
Tata McGraw Hill Publishing Co., New Delhi-685pp.,

Jaques, H.E. (1999) : Plant Families-How to know them?
Agro Botanical Publishers(India)-Bikaner-174pp.,

Palaniyappan, S. (2000) : Angiospermgalin vagaippadu (Taxonomy of
Angiosperms)
V.K. Publishing House, Chennai- 224pp.,

Mathews, K.M. (1987-90) : Flora of TamilNadu & Carnatic (1-4vols.)
Rapinat Herbarium, Trichy.

Lawrence., G.H.M. ( ): An Introduction to Plant Taxonomy
The Central Book Depot, Allahabad.

Sharma. O.P. ( ) : Plant Taxonomy
Tata McGraw Hill Publishing Co., New Delhi- pp

ECONOMIC BOTANY

Hill.,A.W. (1952) : Economic Botany
McGraw Hill Book Co., New York. Pp.,

Gupta, S.K.&
Kaushik, M.P. (1973) : An Introduction to Economic Botany
K. Nath & Co., Meerut, India-147pp.,

Verma, V. (1974) : A Text Book of Economic Botany
Emkay Publications, New Delhi 236pp.,

Govinda Praksh &
sharma, S.K. (1975) : Introductory Economic Botany
Jai Prakash Nath & Cosec$^2\theta$,. Meerut, India-196pp.,

Sambamurthy, A.V.V.S.
& Subrahmanyan, N.S.
(1989) : A Text Book of Economic Botany
Wiley Eastern Ltd., New Delhi, Bangalore, Bombay,
Calcutta, Guwahati, Hyderabad, Lucknow, Madras,
Pune-875pp.,

Sen. S. (1992) : Economic botany
New Central Book Agency, Calcutta-240pp.,

Ashok Bendre &
Ashok Kumar (1998-99) : Economic Botany
Rastogi Publications, Meerut, India-274pp.,

Pandey, B.P. (2000) : Economic Botany
S. Chand & Co., New Delhi-534pp.,

Practical :

Training in dissection, observation, identification and sketching of floral parts of plants. belonging to the families mentioned in the syllabus along with floral diagrams and floral formula. Description of plants in technical terms. Field study flora. Submission of 25 Herborium specimens. Economic plants covered in theory part in taxonomy and economic botany and their importance.

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CC X – PRACTICAL III – COVERING THE CORE COURSES VII, VIII & IX

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MAJOR BASED ELECTIVE I – MEDICAL BOTANY

Unit I

Importance and Relevance of Herbal drugs in Indian system of Medicine, Pharmacognosy – Aim and scope: Branches of Pharmacognosy – Phytochemicals – Reserve materials: Secretory materials: Excretory materials

Unit II

Medicinal gardening – Gardens in the Hills and plains: House gardens, plants for gardening – Poisonous plants – Types of plant poison: action of poisons: treatments for poisons; some poisonous plants; their toxicity and action

Unit III

Adulteration of crude drugs and its detection – methods of adulteration; types of adulteration. Medicinal plants of export values; Rejuvenating herbs; Medicinal uses of Non-flowering plants

Unit IV

Botanical description and active principles of Root drugs, Rhizomes woods and bark drugs (Two examples for each plant organs).

Unit V

Botanical description and active principles of leaves; Flowers, Fruits seed and entire plants ad drugs. Taxonomic study of some selected herbals (Two examples for each plant organs)

Books for Study:

1. Somasundaram S. 1997, Medicinal Botany (Maruthuvath Thavaraviyal) – (Tamil Medium Book)
2. Wallis, T.E. 1967, Text Books of Pharmacognosy
3. Jain S.K. Medicinal Plants
4. Srivastave A.K. 2006, Medicinal Plants, International Book distributiors, Dehradun

Books for Reference:

1. Agarwal, O.P. 1985, Vol. II Chemistry of Organic – Natural products
2. Gamble, J. S. and Fisher, 1921, CEC I, II, III Flora of the Presidency of Madras Volumes
3. Mathew K.M., 1988, Flora of the Tamilnadu and Carnatic
4. nair N.c. and Henry a.M., 1983, Flora of Tamil Nadu, India Botanical Survey of India
5. Chopra r.N. Nagar S.L. and Chopra I.c., 1956, Glosary of Indian Medicinal Plants
6. Chopra R.N., Chopra I.C., Handa K.L. and Kapur L.D., 1994 Indigenous drugs of India
7. Chopra R.N. Badhuvar R.L. & Gosh G. 1965, Poisonous plants of India

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CC XI - PLANT PHYSIOLOGY, BIOCHEMISTRY & BIOPHYSICS

Unit I

Water relation: significance, - osmotic and non-osmotic uptake of water.
Ascent of sap-cohesion theory: root pressure, transpiration, physiology of stomatal
Action, Translocation of solutes and assimilates. Mass flow, - Membrane permeability mineral uptake: Passive and active. Role of major and Minor elements, mineral deficiency symptoms.

Unit II

Photosynthesis: Absorption spectrum, Action spectrum, role of pigments enhancement effect, photosystems I & II
Photosynthetic electron transport, Photophosphorylation,
Carbon Assimilation: Calvin cycle Hatch & Salck pathway, CAM pathway-
Respiration: respiratory substrates. Aerobic and anaerobic. Glycolysis. Kreb's
Cycle and oxidative phosphorylation, energetics of respiration.

Unit III

Plant Growth: regulatory substances; auxins, kinins, gibberellins, abscissic acid and their function. Role of hormones in flowering, senescence and abscission- Photoperiodism, phytochrome-vernalization.

Unit IV

Biochemistry- Physico-chemical forces acting on the living body

Enzymes: Nature and properties. Mechanism of .enzyme action-factors affecting
Enzyme action, substrate concentration – inhibitors, cofactors.
Protein Synthesis
Classification, Structure and functions of carbohydrates, lipids, Proteins, secondary plant product – alkaloids flavonoids, terpenoids and anthocyanins

Unit V

Biophysics-physical forces and chemical bonds, light diffraction-biological effect of ionising radiations basic principles of spectroscopy- Laws of Thermodynamics and entropy-electron transfer processes.

a) Definition of pH-its determination;
b) Buffers and electrolytes and their functions.
c) Fractionation of biological materials by chromatography,
d) Centrifugation.

References

PLANT PHYSIOLOGY

Steward. F.C. (1964) : Plants at Work (A summary of Plant Physiology)

Addison-Wesley Publishing Co., Inc.,
Reading, Massachusetts, Palo alto, London-

Devlin, R.M. (1969) : Plant Physiology
Holt, Rinehart & Winston & Affiliated East West Press (P) Ltd., New Delhi -

Noggle, R. & Fritz (1989) : Introductory Plant Physiology
Prentice Hall of India.

Lawlor. D.W. (1989) : Photosynthesis, metabolism, Control & Physiology
ELBS/Longmans-London.,

Mayer Anderson & Bonning - (1965) : Introduction to plant Physiology
D.Van Nostrand . Publishing Co., N.Y.

Saraswathy Rangamannar (1973) : Thaavara valarchithai martram
(Metabolism & Biosynthesis)
Tamilnadu Text Book society

Periyasamy, K (1978) : "Cell iyakka viyal" (cell Physiology)
Tamilnadu text Book Society,

Hans Meidner (1984) : Class Experiments in Plant Physiology
George Allen & Unwin, London, Boston, Sydney

Srivastava, H.N. (1986) : Plant Physiology
Pradeep Publications, Jalandhar, India

Dulsy Fatima, R.P. et. al 1993 : Biochemistry
Saras Publications, nagercoil, Tamilnadu

Dulsy Fatima, R.P. et. al (1994) : Elements of Biochemistry
Saras Publications, Nagercoil, Tamilnadu

Jain, V.K. (1990) : Fundamentals of Plant Physiology
S. Chand & Co., New Delhi

Pandey, S.N. (1991) : Plant Physiology
Vikas Publishing House (P) Ltd., New Delhi
India

Mukherjee, S. A.K. Ghosh (1998) : Plant Physiology
Tata McGraw Hill Publishers(P) Ltd.,
New Delhi

Verma, S.K. (1999) : Plant Physiology & Biochemistry
S. Chand & Co., New Delhi

Verma, S.K. (1999) : A Text –Book of Plant Physiology
S. Chand & Co.,New Delhi

Salisbury, F.B

&C.W. Ross (1999) : Plant Physiology
CBS Publishers and Printers, New Delhi

Gill, P.S. (2000) : Plant Physiology
S. Chand & Co., New Delhi

Verma, V. (2001) : A Text Book of Plant Physiology
Emkay Publications, New Delhi

BIOCHEMISTRY

Lehninger, A.L. (1984) : Biochemistry (2nd Edition)
Kalyani Publishers, Ludhiana, New Delhi

Trehan, K (1987) : Biochemistry
Wiley Eastern Ltd., New Delhi

Plummer, D.T. (1988) : An Introduction to Practical Biochemistry(3rd Edn.,)
Tata McGraw Hill Publishing Co., Ltd.,New Delhi

Jayaraman, J. (1981) : Laboratory Manual of Biochemistry
Wiley Eastern Ltd., New Delhi

Stryer, L. (1989) : Biochemistrty
W.H. Freeman & Co., New York, San Francisco

Plummer, D. (1989) : Biochemistry –the Chemistry of life
McGraw Hill Book Co., London, N..Y.
New Delhi, Paris, Singapore, Tokyo

Srivastava, H.S. (1990) : Elements of Biochesmitry
Rastogi Publications, Meerut, India

Wilson, K. &
J. Walker (1994) : Principles and Techniques of Practical Biochemistry
(4th Edition), Cambridge University Press, U.K.

Deb, A.C. (1998) : Concepts of Biochemistry (Theory and Practicals)
Books & Allied (P) Ltd., Calcutta

Jain, J.L. (1998) : Fundamentals of Biochemistry
S. Chand & Co., New Delhi

Day, P.M. &
Harborne, J.B.(Eds.,) (2000) : Plant Biochemistrty
Harcourt Asia (P) Ltd., India & Academic Press
Singapore,

BIOPHYSICS

Casey, E.J. (1969) : Biophysics-Concepts and Mechanisms
Van Nostrand Reinhold Co., & Affiliated
East West Press (P) Ltd., New Delhi

Narayanan, P. (2000) : Essentials of Biophysics

New Age International Publishers(P)ltd., New Delhi
Bangalore, Calcutta, Chennai, Guwahati, Hyderabad,
Lucknow, Mumbai

Annie &
Arumugam, N. (2000) : Biochemistry & Biophysics
Saras Publications, Nagercoil, Tamilnadu,

Salil Bose, S. 1982 Elementary Biophysics, Vijaya Printers, Madurai

Practical :

For demonstration only

1. Enzyme activity using amylase.
2. Colorimeter – Operation and working principle
3. pH meter - Operation and working principle
4. Centrifuge - Operation and working principle

To be performed by each student.

1. Colorimetric estimation of sugars
2. Calorimetric estimation of Starch
3. Determination of osmotic pressure of onion/Rheo leaf.
4. Effect of light intensity on transpiration using Ganong's potometer.
5. Determination of stomatal frequency and estimation of transpiration rate.
6. Determination of absorption and transpiration ratio of twigs.
7. Measurement of respiration rate using germinating seeds and flower Buds with simple respiroscope.
8. Separation of plant pigments by paper chromatography.
9. Determination of photosynthetic rate in water plants under different CO_2 Concentrations.
10. Measurement of oxygen evolution under different coloured lights using Wilmott's bubbler.

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CC –XII –PLANT ECOLOGY AND PHYTOGEOGRAPHY

Unit I

General Ecology – Approaches to the study of Ecology, Autecology – Synecology, Plant environment – climatic, edaphic and Biotic factors (interference on Plant habitat by animals – Grazing and browsing, by humans – deforestation, Agriculture)
Allelopathy.

Unit II

Ecosystem concept – components abiotic, autotrophic producers & heterotroophic consumers, biomass ecological pyramids, Productivity – primary, secondary & gross; food chain – food web & energy flow – pond ecosystem.

Unit III

Vegetation – Units of vegetation – formation, association, consociation, society – Development of vegetation: Migration – ecesis, colonization, Methods of study of vegetation (Quadrate & transect). Plant succession – Hydrosere & xerosere. Ecological classification of Plants; Morphological and anatomical features of plants and their correlation to the habitat factors.

Unit IV

Applied Ecology – Pollution and its control
Atmospheric pollution – air – pollution – particulate matter.
Chemicals, Acid rain, Radiation pollution, Noise pollution, Thermal pollution
Soil pollution: Industrial effluents, agricultural pollution, plant residues, insecticides, pesticides, fungicides, herbicides.
Water pollution – Industrial effluents (water soluble metals – liquid effluents oil).

Unit V
Phytogeography
P
Approaches to Phytogeography – Climate of India & its climatic zones, Botanical regions of India – Vegetational types of Tamilnadu: Evergreen, deciduous, scrub & Mangrove, Continuous and discontinuous distribution. Endemism 7 endemics.
Basic knowledge on remote sensing.

REFERENCES:

Plant Ecology & Phytogeography

Daubenmire, R.F. ( ) : Plants & Enviroment (2nd Edn.,)
John Wiley & Sons., N.Y.

Puri, .G.S. (1960) : Indian Forest Ecology(Vol.I & II)
Oxford Book Co., New Delhi& Calcutta.

Billings, W.B. (1965) : Plants and the Ecosystem
Wadsworth Publishing Co., Inc.,Belmont.

Misra, R. (1968) : The Ecology work Book
Oxford & INH Publishing Co., Calcutta

Odum E.P. (1971) : Fundamentals of Ecology (2nd Edn.,)
Saunders & Co., Philadelphia & Natraj Publishers,
Dehradun –574pp.,

Ambasht, R.S. (1974) : Text book of Plant Ecology (3rd Edn.,)
Students & Friends Co., Varanasi - pp.,

Odum E.P. (1975) : Ecology
Holt, Rinert & Winston- pp.,

Oosting, H.G. (1978) : Plants and Ecosystem
Wadworth Belmont.

Kochhar, P.L. (1975) : Plant Ecology(9th Edn.,)
S.Nagi & Co., Jullandhar pp.,

Kormandy, E.J. (1978) : Concepts of ecology(2nd Edition)
Prentice Hall of India (P) Ltd., New Delhi.

Agrawal, K.C. (1987) : Environmental Biology
Agro Botanical Publisher, India.

Ananthakrishnan, T.N.(1978) : Bioresources Ecology(3rd Edn.,)
Oxford &IBH Publishing Co, (P)Ltd.,
New Delhi, Bombay, Calcutta-226pp.,

Misra, K.C. ( ) : Manual of plant Ecology(2nd Edition)
Oxford & IBH Publishing Co., New Delhi.

Vashishta, P.C. (1989-90) : Plant Ecology
Vishal Publications, Delhi, Jalandhar-284pp.,

Kumar, H.D. (1992) : Modern Concepts of Ecology (7th Edn.,)
Vikas Publishing Co., New Delhi-377pp.,

Dash, M.C. (1993) : Fundamentals of Ecology
Tata McGraw Hill, New Delhi-373pp.,

Shukla, R.S. &
P.S. Chandel (1991) : Plant Ecology & Soil Science
S.Chand & Co., New Delhi-305+97pp.,

Arumugam, N. (1994) : Concepts of Ecology (Environmental Biology)
Saras Publications, Nagercoil, Tamilnadu-402pp.,

Mackenzie, A..
A.S. Ball &
S.R. Vindee (1999) : Instant notes in Ecology

Viva Books (P) Ltd., Delhi, Bombay, Chennai -321pp.,

Kumar H.D. (2000) : Biodiversity & Sustainable Conservation Oxford & IBH Publishing Co., Ltd., New Delhi -420pp.,

Sharma, P. D. ( ) : Elements of Ecology Rastogi Publications, Meerut.

Newman, E.I. (2000) : Applied Ecology Blackwell Scientific Publisher, U.K-328pp.,

Chapman, J.L. & M.J. Reiss (1992) : ecology (Principles & Applications) Cambridge University Press, U.K.-294pp.,

Verma, P.S. & Agarwal, V.K.. (1999) : Concept of Ecology (Enviromental Biology) S. Chand & Co., New Delhi-264pp.,

Sharma, P.D. (2000) : Ecology & Envoronment Rastogi Publications, Meerut, India-7=653pp.,

Sundaram, R. (1972) : Thaavara Chuyach Choozhnilai yiyal. Tamilnadu Text Book Society-283pp.,

Chandrasekaran, P. (1996) : Chutruch choozhal Maasupadu (Environmental Pollution) T.K. Printers, Pudukkottai, Tamilnadu-417pp.,

Periyaswamy, K. ( ) : Elements of Plant Ecology Emkay Publications, New Delhi.

Rajasekaran, K. ( ) : Koottu Chchoozhnilai Iyalum thaavara puvi iyalum Tamilnadu Text-Book Society

BalachandraGanesan, K.R. ( ) : Choozhnilai iyal,parinaamam, Marabiyal.

PHYTOGEOGRAPHY

Cain, S.A . (1944) : Foudations of Plant Geography Harper & Brothers, N.Y.

Mani, M.S (1974) : Ecology & Biogeography of India Dr. W. Junk Publishers, The Haque

Good, R. (1997) : The Geography of flowering Plants (2nd Edn.,) Longmans, Green & Co., Inc., London & Allied Science Publishers, New Delhi-495pp.,

Practical :

Study of morphological and anatomical features of hydrophytes and xerophytes. Study of morphological features of epiphytes, parasites and halophytes. Study of vegetation by the quadraat, line transect, estimation of frequency, density & Dominance cover. Determination of

soil & water pH. Analysis of soil water to detect the presence of dissolved salts. The light and dark bottle experiment for primary productivity study in the aquatic ecosystem. Retentivity, absorption and capillarity of soil.

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CC XIII – PRACTICAL IV – COVERING THE CORE COURSES XI & XII

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MAJOR BASED ELECTIVE II - BIOSTATISTICS & COMPUTER APPLICATION IN BOTANY

Theory:-

Unit I

Bio statistics – Definition of bio-statistics, statistical terms – random Sampling – approximation of data – statistical error-logarithms.

Unit II

Frequency distribution-graphical representation- distribution of data in Biology – mean, median and mode – measure of dispersion, standard deviation, standard error -coefficient of variation-limits of the mean – Probability- - Chi square test for goodness of fit.

Unit III

History of computers, Types of Computers, Basic computer concepts, parts of a computer-input (key board, Mouse) and Output devices (Monitors, Printers), computer memory (RAM,ROM), Storage Devices (Floppy disk, Compact disk, Hard disk), Central Processing Unit, Software, Hardware, Computer peripherals – Mouse, Modem.

Unit IV

Computer Network (LAN,WAN), DATA-Representation- Number systems- Binary, arithmetic, Organizing information- the database – definition-Data entry indexing – storage – retrieval – Operating systems – WINDOWS 2000

Unit V

a). Word Processing software MS-Office.
b). DESKTOP PRINTING(DTP)- Application software like- ADOBE Pagemaker, Corel Ventura and Microsoft Publisher and their uses.
c). A Basic knowledge of Networking-Internet-email facilities, terminology connected with them and their uses in Botany.

No Practical for this paper. Only Demonstration of computer application in Botany at The Computer Science Department Laboratory (or) wherever a PC facility is available In the college.

Text Books:

1. Khan & Knanum : Fundamentals of Biostatistics, Ukkax publications, Hyderabad
2. R. Thiagarajan: Computers for Beginners Pvt., Ltd., Madras

Reference Books:

1. Mandal & Nambiar : Agricultural Statistics, Agrobios Publications, Jodhpur
2. P. Parihar: Biostatistics & Biomentry, Agrobios Publications, Jodhpur
3. S. Palanichamy & M. Manoharan : Statistical methods for Biologists, Palani Paramount publications, New Delhi
4. N. Ramakrishnan: Fundamentals of Biostatistics, Sarao Publications, Naaagercoil
5. Peter Norton: Introduction to Computers, Tata MC Graw Hill Publishing Co., New Delhi
6. Ramesh Bangia: The Complete Computer course Cyber Tech. Publishers, New Delhi
7. M. Lotia, P. Nir & P. Lotia, Modern Computer Hardware course BPB Publishers, New Delhi
8. Texali: Lordstar professional 4.0 made simple. Tata Mc Graw Hill Publishing Co., New Delhi.

MAJOR BASED ELECTIVE III - MICROBIOLOGY

Unit 1

Historical outline of Microbiology - the scope, characterization and classification of Microorganisms, Bacteria, (Bergey's manual of determinative bacteriology) Viruses

Unit 2

Bacterial Morphology, cell structure, nutrition, respiration and reproduction.
Viruses and phages – Morphology & reproduction. Economic importance of Bacteria

Unit 3

Soil Microbiology: common soil microflora – Bacteria, Fungi and Actinomycetes.
Food Microbiology:- Microbial spoilage of foods, canned foods, food preservation, Food poisoning.

Unit 4

Agricultural Microbiology:- N2 – fixing bacteria, Phosphate solubilization, Mycorrhizae. Biological Control – control of pests and diseases. Medical Microbiology: Mycoses, Chemotherapeutic agents and Chemotheraphy

Unit 5

Antibiotics – Antibiotic and mode of action with reference to Pencillin, streptomycin, erythromycin, Bacitracin methods of sterilization, Pasteurization and maintenance of microbial culture.

Références :

MICROBIOLOGY

Balasubramanian, A. (1977) : Nunnuyirigal (Microbes)
Tamilnadu Text Book Society, Madras-373pp.,

Subba Rao, N.S. (1978) : Soil Microorganisms & Plant Growth
Oxford & IBH Publishing Co., Ltd.,
New Delhi, Bombay, Calcutta-289pp.,

Chandrasekaran, P. (1993) : Nunnuyiriyal (In Tamil)
T.K. Pathippagam, Pudukkottai-328pp.

Rangaswami, G. &
D.J. Bhagyarai (1993) : Agricultural Microbiology (2nd Edn.,)
Prentice Hall of India(P)Ltd., New Delhi-422pp.,

Schlegal, H.G. (1986) : General Microbiology(7th Edition)
Cambridge University Press, U.K.-655pp.,

Biswas, S.B. &
Anita Biswas (1990) : An Introduction to Viruses
Vikas Publishing House (P) Ltd., New Delhi-292pp.,

Aneja, K.R. (1993) : Experiments in Microbiology, Plant Pathology & Tissue Culture
Wishwa Prakashan(Wiley Eastern Ltd.,)New Delhi, Bangalore, Bombay, Calcutta, Guwahati, Hyderabad, Lucknow, Madras, Pune-471pp.,

Pelczar, M.J., Chan, E.C.S., & Krieg, N.P. (1993) : Microbiology
Tata McGraw Hill Publishing Co., Ltd., New Delhi -918pp.,

Sharma, P.D. (1993) : Microbiology
Rastogi Publications, Meerut, India-359pp.,

Gunasekaran, P. (1995) : Laboratory Manual in Microbiology
New Age International (P)Ltd., Publishers, New Delhi, Bangalore, Bombay, Calcutta, Guwahati, Hyderabad, Lucknow, Madras, Pune, London, Bangkok-141pp.,

Heritage, J. Evans, E.G.V.& Killington, R.A. (1996) : Introductory Microbiology
Cambridge University Press. U.K. –234pp.,

Bilgrami, K.S. & Sinha, R.K. (1997) : Essentials of Microbiology
CBS Publishers and Distributors(P)Ltd., Delhi -187pp.,

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