

M. Phil. BOTANY

SEM	SUBJECT CODE	COURSE	COURSE TITLE	NO. OF HOURS	CREDIT	CIA MARKS	SE MARKS	TOTAL MARKS
I	14MPBO1C1	CORE - I	Research Methodology	4*	4	40	60	100
	14MPBO1C2	CORE - II	Advanced Plant Science	4*	4	40	60	100
	14MPBO1C3	CORE - III	Guide Paper (Based on Research Topic)	4*	4	40	60	100
	14MPBO1C4	CORE - IV	Teaching & Learning Techniques	4*	4	40	60	100
* One hour library for each Courses								
TOTAL				16	16	160	240	400
II	14MPBO2PW	Project Work	Dissertation**	-	8	-	-	200
GRAND TOTAL				-	24	-	-	600

** (Evaluation of the Dissertation shall be made jointly by the Research Supervisor and the External Examiner)

Project (M.Phil)

Maximum Marks: 200

I review 20 Marks

II review 20 Marks

Evaluation of project 120 Marks

Viva voce 40 Marks

**SEMESTER I: CORE I
RESEARCH METHODOLOGY**

Course Code : 14MPBO1C1
Hours/Week : 4
Credit : 4

Max. Marks : 100
Internal Marks : 40
External Marks: 60

Objective:

To inculcate the basic knowledge and skills of systematic methods or research.

UNIT-I **15 hours**

Microscopic technique: #Principles and methods of interference, polarization#, fluorescence and confocal microscopes. Applications of Immuno-fluorescence – *in situ* hybridization - Principles, techniques and applications of TEM, SEM and AFM.

UNIT-II **15 hours**

Analytical techniques: General principles – Instrumentation - NMR, ESR, AAS, AES and AFM - Spectroscopic methods – UV-vis, UV-IR, FTIR - #Basics of radioactivity# - Radioactive analysis techniques: GM, LS and Scintillation counters.

UNIT-III **15 hours**

Chromatographic techniques: Adsorption, ion exchange, affinity, GC, HPLC, HPTLC. Electrophoretic techniques: Protein: PAGE – Nucleic acid: Agarose Gel Electrophoresis – Immuno – #isoelectric focusing and two-dimensional#.

UNIT-IV **15 hours**

Molecular biological techniques: # Isolation and amplification of nucleic acid – plasmid, chromosomal DNA# and PCR – RAPD, RFLP, AFLP, ISSR - Methods of detection of clones – nucleic acid transfer by blotting – hybridization – plaque, colony hybridization – Detection of β -galactosidase – antibody screening, color development reaction.

UNIT-5 **15 hours**

Research Publications: Preparation of manuscripts – full papers, short communications – review papers – thesis writing – bibliography – index card and its maintenance. Internet and applications: Web Browsing and searching – #Electronic biological databases – Biological abstracts and Current contents#.

#.....# Self Study Portion

Text book:

T.B.1. Gurumani, Research Methodology, Tamilnadu Book House, Chennai. 2004.

Books for study:

1. Gupta, P.K. Cell and Molecular Biology, Rastogi Publications, Meerut, 2006.
2. Prescott's Microbiology, Mcraw hill International Edition.
3. Bajpai, P.K.. Biological instrumentation and methodology, S. Chand and Company Ltd, 2010.
4. Gupta, P.K. Biotechnology and Proteomics, Rastogi Publications, Meerut. 2006.
5. Ramadass, P and Wilson Aruni, A. Research Writing, MJP Publishers, 2010.

UNIT I	Chapter – 9. T.B.1.
UNIT II	Chapter
UNIT III	Chapter – 12. T.B.1.
UNIT IV	Chapter
UNIT V	Chapter

**SEMESTER I: CORE II
ADVANCED PLANT SCIENCE**

Course Code : 14MPBO1C2
Hours/Week : 4
Credit : 4

Max. Marks : 100
Internal Marks : 40
External Marks: 60

Objective:

To study recent advancements in the field of plant science.

UNIT-I

15 hours

Plant Cell and Molecular Biology: #Structural organization of the plant cell# – Fundamental aspects of cell organelles – Techniques in cell biology – *in situ* hybridization for location of transcripts in cell types – FISH, GISH.

UNIT-II

15 hours

Bioinformatics: Major search engines and Scientific databases – Sequence – Genome – #Literature databases# – Sequence database searching programmes – BLAST, FASTA, BLITZ.

UNIT-III

15 hours

Plant Physiology and Biochemistry: Membrane Transport Proteins – Signal transduction – #Light harvesting complexes – CO₂ sequestration – overview of respiratory cycles# – Synthesis of membrane lipids – Phytochemical and biochemical properties of cryptochromes – Physiological role of brassinosteroids – Polyamines – Genetic and molecular analysis of photoperiodism – Molecular aspects of stress physiology.

UNIT-IV

15 hours

Plant Biotechnology: #Knowledge on chloroplast and mitochondrial genomes# – rDNA technology – Genetic engineering of plants – Genetic and physical mapping of genes, Functioning of genomics – Microarrays – Protein profiling and its significance.

UNIT-V

15 hours

Plant Biodiversity: #Concepts, principles and scope#. *In situ* conservation: Sanctuaries, National parks, Biosphere reserves, Mangroves – *Ex situ* conservation: Botanical gardens, Gene banks, Seed Banks, Cryobanks – Activities of IUCN, NBPGR – Applications of molecular markers in Biodiversity. #Plant biodiversity databases#.

#.....# **Self Study Portion**

Books for study:

1. Mani, K. and Viyaraj, N. Bioinformatics for beginners, Kalaikathir Achchgam, Coimbatore, India, 2002.
2. Krishnamurthy, K.V. Oxford and IBH publishing Co. Pvt. Ltd. New Delhi.
3. Jain V. K. Fundamentals of plant physiology, C. Chand and Company Ltd, 2010.
4. Murthy SCV Bioinformatics, Himalaya a Publishing House, India, 2003.
5. Albert L. Lehninger, David L. Nelson and Michael, M. Principles of Biochemistry.
6. Westhed, D.R. Parish and Twyman, Bioinformatics, Viva books Private limited, 2003.
7. Dubey R.C. Text book of Biotechnology, S. Chand & Company Ltd, 2009.
8. Kothari, A. Understanding Biodiversity: Life Sustainability and Equity. Orient Longman, 1997.
9. Falk, D.A., Olwell, M. and Millan, C. Restoring Diversity. Island Press, Columbia, USA, 1996.

**SEMESTER I: CORE III
RESEARCH AREAS IN BOTANY**

Course Code : 14MPBO1C3
Hours/Week : 4
Credit : 4

Max. Marks : 100
Internal Marks : 40
External Marks: 60

**SEMESTER I: CORE IV
TEACHING AND LEARNING METHODOLOGY**

Course Code : 14MPBO1C4
Hours/Week : 4
Credit : 4

Max. Marks : 100
Internal Marks : 40
External Marks: 60

Objective:

To acquire knowledge of basic methods of teaching and learning.

UNIT-I **15 hours**

Higher education Historical Perspective - The Objective of higher Education
Role of higher education - Social focus - Curricular focus - Administrative focus - Need for Teaching Methodology - #Learning and Teaching#.

UNIT-II **15 hours**

Learning in higher education: Learning – Definition - Learning hierarchy - #Information processing# - Learning events - Learning outcomes - Motivation.

UNIT-III **15 hours**

Teaching technology designs: Teaching technology - Instructional and Education technology - Instructional Designs: objective, skill, competency, learning style and Model based designs - #Combination of teaching strategies and instructional designs#.

UNIT-IV **15 hours**

Remedial teaching: Remedial teaching-diagnosis-Principles of Diagnosis - Steps in Diagnosis – Reading - Remedial Education in Reading - Causes of Reading Disability - Reading Programmes - Development of reading Programme - Corrective Instruction - Remedial Instruction - #Remedial Teaching for Academic Low Achievers#.

UNIT-V **15 hours**

Guidance and counseling in higher education: Meaning and Scope of Guidance - Principles of Guidance – Counseling - #Vocational guidance#.

Text Book:

Vedanayagam, E.G. Teaching Technology for College Teachers. Sterling Publishers Private Limited,

UNIT I	Chapter – 1. T.B.1.
UNIT II	Chapter – 2 . T.B.1.
UNIT II	Chapter – 3. T.B.1.
UNIT III	Chapter – 4. T.B.1.
UNIT IV	Chapter – 7. T.B.1.
UNIT V	Chapter – 11. T.B.1.