M. Phil Botany

Syllabus 2017 - 2018 onwards

Since 1951

DEPARTMENT OF BOTANY
Jamal Mohamed College (Autonomous)
College with Potential for Excellence
Re-Accredited (3rd Cycle) with 'A' Grade by NAAC
(A f f i l i a t e d t o B h a r a t h i d a s a n U n i v e r s i t y)
Tiruchirappalli – 620 020

JAMAL MOHAMED COLLEGE (Autonomous), Tiruchirappalli-620 020

M.Phil., Botany– Course Structure

(For the candidates admitted from the academic year 2017-2018 onwards)

Sem	Course code	Course	Course title	Ins.Hrs / Week	Credit	Marks		
						CIA	SE	Total
I	17MPBO1C1	CORE I	Research Methodology	4*	4	40	60	100
	17MPBO1C2	CORE II	Advances in Plant Science	4*	4	40	60	100
	17MPBO1C3	CORE III	Guide Paper	4*	4	40	60	100
	17MPBO1C4	CORE IV	Teaching and Learning Methodology	4*	4	40	60	100
		*One hour library for each course						
	TOTAL			16	16	160	240	400
II	17MPBO2PW	Project Work	Dissertation**	-	8	-	-	200
GRAND TOTAL				-	**24**	-	-	**600**

** Evaluation of the Dissertation and Viva Voce shall be made jointly by the Research Supervisor and the External Examiner.

Project (M. Phil)

Maximum Marks	:	200 Marks
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: 17MPBO1C1 **Maximum Marks: 100**

Ins. Hours/Week: 4 **Internal Marks: 40**

Credits: 4 **External Marks: 60**

Objective:

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

Unit I Microscopic techniques **12 Hrs**

Microscopy- Principles and applications. Properties of electromagnetic radiations; Light, Phasecontrast and Fluorescent microscopy.Calibration and microscopic measurements.#Electronmicroscopy-Principles and applications of TEM and SEM; Preparation of materials for electronmicroscopy#.

Unit II Analytical Methods **12 Hrs**

Spectroscopic techniques- UV and Visible, IR, NMR and AAS.

Electrochemical techniques – Principles,measurement of pH and preparationof biological buffers, oxygen electrode.

#Radioisotope techniques-measurement of radioactivity and applications of GM and Scintillation counter, Autoradiography#.

Unit III Separation techniques **12 Hrs**

Chromatography- Principles and applications-Paper, Thin layer, Column, GC,HPLC

Centrifugation-Principles and types-preparative and general purpose centrifuges; #Ultracentrifugation-types-analytical ultracentrifuges#.

Electrophoretic techniques: Principles and applications SDS-PAGE, 2DE, Agarosegel electrophoresis.

Molecular techniques: PCR based-RFLP, RAPD, AFLP, SSR, blotting techniques.

Unit IV Statistical Methods **12 Hrs**

Population and sampling, data collection, analysis and graphical representation.#Measures ofCentral Tendency#, Measures of Dispersion-Standard Deviation; Correlation and Regressionanalysis, Probability -normal and binomial distribution. Statistical testing: F-test, t-test and chi-square test. Experimental design, ANOVA - one way and two way analysis.

Unit V Documentation of Research **12 Hrs**

Research- Meaning - Role of a researcher – Hypothesis - Methods-Approaches Objectives.

Literature and Reference collection.#Role of libraries in research#, virtual libraries.Internet-Worldwide web-searching and browsing tools- e-journals and e-books.Manuscript preparation-Citation and Proof correction, Dissertation- components of a dissertation-tables, figures, footnote,discussion.Role of Supervisors/Guides in research.

#.....# Self Study Portion

Books for Reference:

1. Wilson K and Walker. Practical biochemistry V Edition CambridgeUniversities Press, London, 2000.
2. Gurumani N. Research methodology, MJP publishers, Chennai, 2006.
3. Khan and Khan.Biostatistics. VikasPublising House Pvt. Ltd. New Delhi, 1994.
4. Sandhu GS. Research techniques in biological sciences (1st edition), Anmol Publications, NewDelhi, 1990.
5. StockR and Rice CBF. Chromatographic methods, Chapman and Hall Ltd.London, 1980.
6. Panse and SukhatmeStatistical Methods for Agricultural workers. ICAR, NewDelhi, 1992.

SEMESTER I :CORE II

Advances in Plant Science

Course Code: 17MPBO1C2 **Maximum Marks: 100**

Ins. Hours/Week: 4 **Internal Marks: 40**

Credits: 4 **External Marks: 60**

Objective:

To study the recent advancements in the field of plant science.

Unit I: Plant Cell and Molecular Biology 12Hrs

#Structural organization of the plant cell# – Fundamental aspects of cell organelles – Techniques in cell biology – *in situ* hybridizationfor location of transcripts in cell types – FISH, GISH.

Unit II: Bioinformatics 12Hrs

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

Unit IIIPlant Physiology and Biochemistry 12 Hrs

Membrane Transport Proteins – Signaltransduction – #Light harvesting complexes – CO2 sequestration – overview of respiratorycycles# – Synthesis of membrane lipids – Phytochemical and biochemical properties ofcryptochromes – Physiological role of brassinosteroids – Polyamines – Genetic andmolecular analysis of photoperiodism – Molecular aspects of stress physiology.

Unit IV: Plant Biotechnology 12Hrs

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

Unit V: Plant Biodiversity **12 Hrs**

#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 Reference:

1. Murthy SCV Bioinformatics, Himalaya a Publishing House, India, 2003.
2. Lehninger AL Nelson DL and Michael M. Principles of Biochemistry, Westhesd,
3. Parish DR and Twyman, Bioinformatics, Viva books Private limited,2003.
4. Dubey RC. Text book of Biotechnology, S. Chand & Company Ltd, 2009.
5. Kothari A. Understanding Biodiversity: Life Sustainability and Equity. OrientLongman, 1997.
6. Krishnamurthy KV. An advanced Text book on biodiversity, Oxford and IBH Book. Co., New Delhi, 2003.

SEMESTER I :CORE III

Guide Paper

Course Code: 17MPBO1C3	**Maximum Marks: 100**
Ins. Hours/Week: 4	**Internal Marks: 40**
Credits: 4	**External Marks: 60**

SEMESTER I : CORE IV

Teaching and Learning Methodology

Course Code: 17MPBO1C4 **Maximum Marks: 100**

Ins. Hours/Week: 4 **Internal Marks: 40**

Credits: 4 **External Marks: 60**

Objective:

To acquire knowledge of basic methods of teaching and learning.

Unit I: Higher education **12Hrs**

Historical Perspective - The Objective of higher Education

Role of higher education - Social focus - Curricular focus - Administrative focus - Need forTeaching Methodology - #Learning and Teaching#.

Unit II: Learning in higher education **12Hrs**

Learning – Definition - Learning hierarchy -#Information processing# - Learning events - Learning outcomes - Motivation.

Unit III: Teaching technology designs **12 Hrs**

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

Unit IV: Remedial teaching **12Hrs**

Remedial teaching-diagnosis-Principles of Diagnosis – Stepsin 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: Guidance and counseling in higher education **12Hrs**

Meaning and Scope of Guidance -Principles of Guidance – Counseling - #Vocational guidance#.

Book for reference:

VedanayagamEG. Teaching Technology for College Teachers. Sterling Publishers Private Limited,

SEMESTER II :PROJECT WORK

DESSERTATION

Course Code: 17MPBO2PW	**Maximum Marks: 200**
Hours/Week: 00	**Internal Marks: 00**
Credits: 8	**External Marks: 200**