BHAGWANT UNIVERSITY
Sikar Road, Ajmer
Rajasthan

Syllabus

Institute of Life Sciences & Applied Sciences
M. Phil
(Botany)

M. Phil. - Botany

ANNUAL SCHEME OF EXAMINATION

1. Every candidate shall be required to offer three written papers and one dissertation (equivalent to one paper). Within this frame work the Board of Studies shall recommend the course of study for the M. Phil examination.
2. The course of study for the M. Phil degree shall extend over a period of one academic year. There shall be a continuous internal assessment and as external assessment. The proportion of internal and external assessment shall be 30:70. There will be no internal assessment in the dissertation. Total marks for M. Phil will be 400. Dissertation may be written by the candidates under the supervision of any teacher who is registered as M. Phil Supervisor. Supervisor can guide normally five dissertations. However, the maximum limit may be relaxed by the permission of Vice-Chancellor on the recommendation of Head. The internal Supervisor can guide five candidates and workload of six hours is admissible for each M. Phil course for dissertation. The Supervisor will sign and issue a certificate counter signed by the Head of department concerned.
3. The internal assessment may be evaluated on the basis of:
   (a) Mid Terms : 15 Marks
   (b) Assignments /Seminar Presentation /Group Discussion: 15 Marks
4. Each theory paper shall consist of 100 marks. The dissertation shall also consist of 100 marks. For a pass, a candidate shall be required to obtain (a) at least 40% marks in each paper separately (b) a minimum of 50% marks in the aggregate of all the papers prescribed for the examination. In the mark sheet, successful candidates shall be classified as under

First Division	65% or more.
Second Division	50-65%

6- A candidate will have to pass individually both in the Internal as well as external examination and it should be shown separately in the marks sheet.

7- The placement of every candidate under a Supervisor/Guide shall be decided within two months from the last date for admission.

8- A candidate who fails at the examination even in one paper/dissertation shall be required to reappear at the examination in a subsequent year in all the papers/dissertation prescribed for the examination, provided that a candidate who obtains at least 50% marks in dissertation shall be exempted from the submitting a fresh dissertation and the marks obtained by him shall be carried forward for working out his result.

9- For each theory paper 10 questions will be set for the final examination and the candidate will have to attempt at least five questions. All the questions will carry equal marks.

10- Workload distribution: There will be a teaching of four periods of one hour duration per week for each theory paper and six hours for dissertation.
i.e. 4X3 = 12 hours for theory papers and six hours for dissertation per week.

M. Phil. - Botany

Subject Code	Subject Name	Teaching hours			Distribution of marks						
					Theory Papers				Practicals		
					Internal		External	Total	Int.	Ext.	Total
		L	T	P	Mid Terms marks	Assignments / Seminar Presentation / Group Discussion					
01MPL02101	Research Methodology Theory And Techniques	3	1	-	15	15	70	100	-	-	-
01MPL02102 OR 01MPL02103	Advanced Cytogenetics OR Microbiology and Industrial Biotechnology	3	1	-	15	15	70	100	-	-	-
01MPL02104	Plant Cell, Tissue and Organ Culture	3	1	-	15	15	70	100	-	-	-
01MPL02201	Dissertation	-	-	2	-	-	-	-	-	100	100
Total		9	3	2	45	45	210	300		100	400

Grand Total-400

01MPL02101 RESEARCH METHODOLOGY THEORY AND TECHNIQUES

Unit - 01

Research - definition - importance and meaning of research - characteristics of research - types of research - steps in research - identification, selection and formulation of research problem – research questions - research design - formulation of hypothesis - review of literature

Unit - 02

Sampling techniques : sampling theory - types of sampling - steps in sampling - sampling and non-sampling error - sample size - advantages and limitations of sampling. Collection of data : primary data - meaning - data collection methods - secondary data - meaning - relevances, limitations and cautions.

Unit - 03

Statistics in research - measure of central tendency - dispersion - skewness and kurtosis in research. Hypothesis - fundamentals of hypothesis testing - standard error - point and interval estimates - important non-parametric tests : sign, run, kruskal - wallis tests and mann-whitney test.

Unit - 04

Para metric tests : testing of significance - mean, proportion, variance and correlation - testing for significance of difference between means, proportions, variances and correlation co-efficient. Chi-square tests - anova - one-way and two-way.

Unit - 05

Research report : types of reports - contents - styles of reporting - steps in drafting reports - editing the final draft - evaluating the final draft.

01MPL02102 ADVANCED CYTOGENETICS

1. Dynamics of cell division. Karyotype differentiation and evolution.

2. chromosomal aberrations (numerical and structural) Translocation Inversions

Duplication and deficiencies Their role in chromosome mapping

3. Evolutionary role of polyploidy and it uses:

4. Aneuploids Alien chromosomes, gene substitution and addition and their probable role in crop improvement.

5. Cytogenetic nature of sex determination.

6. Structure and composition of chromatin & chromosomes including the details of the structure of centromere and telomeres.

7. Techniques and mechanism of banding in chromosomes

OR

01MPL02103 MICROBIOLOGY AND INDUSTRIAL BIOTECHNOLOGY

1. scope and application of microbes in :
(a) Agriculture with reference to biological nitrogen fixation.
(b) Food (sources of food and feed)
(c) Pollution (degradation of pesticides and hydrocarbons in soils.

2. Biococnversion of agricultural crop residues and garbage by microbes for the production of alcohol and biogas.

3. Medical microbiology: Laboratory diagnosis of important human diseases antimicrobial drugs and their mechanism of action and drug resistance.

4. Immunobiology _preparation of antigens and antisera, characterization of antigen antibody reactions by immunodouble diffusion and general immunoelectrophoretic techniques and western blotting, characterization of antigenic sites by immunoelectron microscopy, strategies for the production of vaccienes and monoclonal antibodies.

5. Microbiology of phylloplane and its applications in biological control of airborne insect pests and fungal pathogens.

6. Microbiology of rhizosphere and its importance in controlling soil- borne plant pathogens.

7. General considerations of microbial strain improvement for agriculture, medicine and industry.

8. General considerations for biotransformation and production of useful compounds through cell culture, factors affecting yield; immobilized cell systems and bioreactors.

9. Industrial production of:
(a) Antibiotics
(b) Acetic acid
(c) Lactic acid
(d) Citric acid
(e) Common enzymes and
(f) Microbial insecticides

01MPL02104 PLANT CELL, TISSUE AND ORGAN CULTURE

1.Techniques of organ, tissue, free cell and protoplast culture.
2.Methods of preparation and sterilization of tissue and culture media.
3.Aspects of nutrition of plant tissue and organ cultures.
4. In vitro culture and application of the following:
   Apical meristem
   Flower, fruit
5. Anther and pollen, pathways of androgenesis
6. Ovary, ovule, nucellus and endosperm
7. Embryo and its significance in breeding
8. Protoplast culture, somatic hybridization and its application in crop improvement.
9. Totipotency of free angiosperm cell and the significance of free cell culture.
10. Growth, differentiation and organogenesis in plant tissue and organ culture
11. Somaclones and induced variations
12. Gene delivery systems and role of transgenes in crop improvement
13. Industrial production of secondary metabolites from callus

01MPL02201 DISSERTATION

Each student will submit dissertation on any one topic related to Botany. Dissertation will be guided by supervisor of the university and will be examined by external.

****