



PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGAR

SALEM – 636011

**DEGREE OF MASTER OF PHILOSOPHY
CHOICE BASED CREDIT SYSTEM**

**SYLLABUS FOR
M.PHIL. ZOOLOGY
(SEMESTER PATTERN)**

**(For Candidates admitted in the Colleges affiliated to
Periyar University from 2017-2018 onwards)**

REGULATIONS

OBJECTIVES

To provide course of study to postgraduates in Sericulture with a view to strengthen their foundations for undertaking M.Phil work in theoretical and Applied Sericulture.

ELIGIBILITY FOR ADMISSIONS

Good academic record with first or second class Masters Degree in Zoology of Periyar University or in examination recognized there equivalent to.

DURATION

The duration of the M.Phil course will be one year.

COURSE STRUCTURE

Course Structure for M.Phil., (Zoology) Under CBCS

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

COURSE OF STUDY AND SCHEME OF EXAMINATION

S.No.	Course	Subject Title	Exam Hrs	Credits	University Examination		
					Internal (25%)	External (75%)	Total
I SEMESTER							
1.	Paper I	Research Methodology	3	4	25	75	100
2.	Paper II	Recent Advances in Zoology	3	4	25	75	100
3.	Paper III	Optional subject (Guide Paper)	3	4	25	75	100
II SEMESTER							
4.	Paper IV	*Dissertation Evaluation		8	50	100	150
		Viva - voce		4			50
		TOTAL		24			500

*For 200 Marks

EXAMINATIONS:

Question Paper Pattern for M.Phil Zoology Course.

Time: 3Hrs

Max.75

Part A – (5 x 5 = 25 Marks)

Answer ALL question choosing either 'a' or 'b'

Part B – (5 x 10 = 50 Marks)

Answer ALL question choosing either 'a' or 'b'

University conducts the examination for Paper – I and Paper – II at the end of First Semester.

- ♦ Supervisor will provide syllabus and two sets of Question Paper for Paper – III to the University. The controller of examinations will conduct the examination for Paper – III at the end of First Semester.
- ♦ Passing minimum in each Paper is 50%

Theory Papers:

Total mark for each Paper is 100. 25 marks for Internal and 75 marks for University Examination. The Internal Assessments may be in the form of Combination of Periodical tests and Assignments for Theory Papers. The Components are:

1.	Attendance	=	05 Marks
2.	Assignment/Seminar	=	10 Marks
3.	Test	=	10 Marks
	Total	=	25 Marks

Dissertation:

The Marks for the Dissertation is 200 and the Components are:

Evaluation:

- | | | | |
|----|---|---|-----------|
| 1. | Evaluation of Project report by External Examiner | : | 100 Marks |
| 2. | Evaluation of Project report by Internal Examiner | : | 50 Marks |
| ❖ | Viva – Voce conducted by Supervisor and External Examiner in the Department | : | 50 Marks |
| | Total | : | 200 Marks |
- ❖ Dissertation should be valued by the Supervisor and the External Examiner.
 - ❖ Viva – voce should be conducted by the Supervisor and the External Examiner

M.PHIL. ZOOLOGY
PART - I
PAPER I - RESEARCH METHODOLOGY

UNIT I Principles and Application

Electron Microscopy (SEM, TEM & STEM) – UV Visible Spectrophotometer, Atomic absorption Spectrophotometer – Centrifuges – Low, High and Ultracentrifuge – PCR – pH meter – ELISA.

UNIT II Separation and Analytical Techniques

Chromatography – High Performance Liquid Chromatography, Gas Chromatography and Thin Layer Chromatography – Electrophoresis – PAGE, Agar Gel – Immunoelectrophoresis – RIA Blotting Techniques – Western, Southern and Northern. Tracer Technique – Autoradiography and its applications, Radiation measuring devices – Geiger Muller Counter, Scintillation Counter – Principle and applications.

UNIT III Histological and Histochemical Methods

Histochemical Techniques – Protein, Carbohydrates, Lipids and DNA – Histological Preparation of tissues for SEM & TEM. Photography – Photomicrography – Image Analyzer – Principles and applications.

UNIT IV Data Processing and Analysis

Measures of Central Tendency – Standard Deviation, Correlation, Regression, Student 't' test, Chi - Square test, ANOVA. Software Application – Word, Excel, Power point, Statistical software – SPSS.

UNIT V Research Methods and Thesis Writing

Identification, Selection and Scope of Research problems – Methods of literature collection and review – planning and execution of investigation – Thesis writing – Preparation and Presentation of Research Papers for Journals, Conferences – Preparation of short communications and review articles.

REFERENCE BOOKS:

1. Anderson, Durston and Polle 1970. Thesis and Assignment Writing, Wiley Eastern Limited.
2. Bier, 1959. Electrophoresis: Theory, Methods and Applications, Academic Press, London.
3. Reverjedge B, 1979. The Art of Scientific Investigation W.E. Norton and Co., New York.
4. Fisher R.A, 1950. Statistical Methods of Research Workers.
5. Freund J E, 1967. Modern Elementary Statistics, Prentice Hall, Inc. Englewood cliffs, N J.
6. Malter K, 1972. Statistical Analysis as in Biology, Chapman Hall, London.
7. Campbej R C, 1975. Statistics for Biologists 2nd Edition. Cambridge University Press, London.
8. Chayan J and Butcher R.G, 1973. Practical histochemistry, Wiley Interscience Publication, London.
9. Clark G.L, 1961. The Encyclopedia of Microscopy, Reinhold Publishing Corporation, New York.
10. Block, R.I. Durrum E.K. and Eweig, G. 1956. A Manual of Paper Chromatography Electrophoresis Academic Press, New York..

M.PHIL. ZOOLOGY**PART - I****PAPER II - RECENT ADVANCES IN ZOOLOGY****UNIT I Molecular Biology**

DNA Sequencing and Human Genome Project, DNA Finger Printing and Foot Printing, DNA Amplification and RT – PCR, Gene and cDNA Library. Detection of genetic diseases using DNA recombinant technology, Screening and Counseling – Human Gene Therapy – Animal Cell Culture primary and established cell line – Stem Cell Therapy. DNA Methylation, antisense RNA, Transposons, Signaling by receptors. Cloning technique and its application in Biology, knock out genes – Ethical issues. Reproductive technologies related to Human in vitro Fertilization.

UNIT II Immunology

Antigen – Structure and functions of different classes of immunoglobulins, Primary and Secondary Immune Response Lymphocytes and Accessory Cells. Humoral and Cell Mediated Immunity, MHC, Mechanism of Immune Response and Generation of Immunological diversity.

UNIT III Environmental Pollution

Environmental Pollution (air, water and soil) – causes and remedies – Environmental impact assessment – Environmental laws – Risk assessment. Environmental Education, Planning and Management – Bioremediation. Bio-indicators and Molecular markers. Renewable and Non Renewable sources of Energy, Conventional and Non-Conventional, Solar & Tidal Energy – Biogas Production – Nuclear Energy – Indian Nuclear Power Plants. Biodiversity – Types, Measures of Diversity – Biodiversity Conservation laws. Remote sensing and GIS – Basic concepts.

UNIT IV Microbial Genetics

Organization and Expression of Immunoglobulin gene. Vaccine – Whole Organism Vaccines, Recombinant Vaccines, DNA Vaccine, Edible Vaccines. Applications of RIA, Immunofluorescence, ELISA, Western Blot and Monoclonal Antibodies in diagnosis of various disease. Molecular Diagnosis: Karyotyping – FISH – RFLP HLA, tissue typing and Organ Transplantation.

UNIT V Biotechnology

Methods involved in the Production of DNA Technology – Transgenic Plants and Animals and their uses. Production of Recombinant antibiotics, Insulin and Growth Hormone. Genetic Engineering – Enzyme Technology – Terminator Genes. Biofertilizers – Composting – Biopesticides – SCP – Production and Sources.

REFERENCE BOOKS:

1. Dupraw E.J. 1969: Cell and Molecular Biology, Academic Press, Oxford & IBH.
2. Beyer, A.L. et. al. 1979: Molecular Genetics, Part – III: Chromosome Structure (ed) Taylor, J.H. Academic Press, New York.
3. Kavitha B Ahluwalia 1991: Genetics – Wiley Eastern Ltd., New Delhi.
4. Capeuter, P.L. 1975, Immunology and Serology 3rd ed. W.B. Sawnders Co. Philadelphia.
5. Bellanti, J.A. 1971: Immunology, W.B. Sawnders Co. Philadelphia.
6. Dutcherlony, O. 1968: Hand Book of Immunodiffusion and Immunoelctrophoresis. Ann. Arbor Science Publishers, Ann. Arbor Michigan.
7. Bernard J. Nebel 1987: Environmental Science. The way world works 2nd ed. Prentice Hall Inc. Englewood, Cliffes, New Jersey.
8. Monney H.A. and M. Goddon – 1983: Disturbance and Ecosystems. Springer verlag publication, New York.
9. Moran, J.M. Moran, M.D. and J.H. Wiersma 1980: Introduction to Environmental Science, H.W. Freeman and Co. Sanfrancisco, U.S.A.
10. Moat, A.G. and Foster, J.N. 1995: Microbial Physiology, 3rd ed., Wiley – Liss, New York.
11. Friefelder, D. 1987: Microbial Genetics Jones and Bartlett Publication, Boston.
12. Freeman, B.A., 1979: Text Book of Microbiology W.B. Sawnders and Co.
13. Morgan, J. and Welan, W.J. 1979: Recombinant DNA and Genetic Experimentation. Pergmon Press, Oxford, New York.
14. R.H. Pritchard & Holland, I.B. 1985: Basic Cloning Techniques a Manual of Experimental Procedures. Blackwell Scientific Publications, Oxford, London.
15. Williams, J.C. 1981: The Preparation and Screening of cDNA Clone Bank. Genetic Engineering Vol. I (ed. Williamson, K) Academic Press, London.