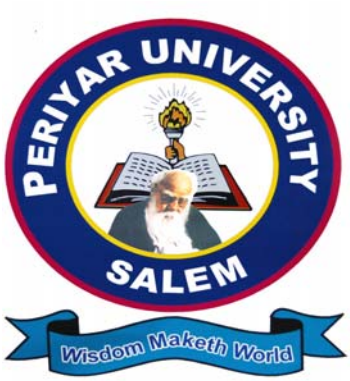
PERIYAR UNIVERSITY
PERIYAR PALKALAI NAGAR
SALEM – 636 011



DEGREE OF MASTER OF PHILOSOPHY

CHOICE BASED CREDIT SYSTEM

SYLLABUS FOR M.PHIL. ZOOLOGY

FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2012 – 2013 ONWARDS

Objectives:

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

Eligibility for Admission:

Good academic record with first or Second class Masters Degree in Zoology of Periyar University or in examinations 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 2012-2013 onwards)

Semester	Course	Course Title	Exam Hours	Credit	Internal Mark	External Mark	Total Marks
I	Paper- I	Research Methodology	3	4	25	75	100
	Paper-II	Recent Advances in Zoology	3	4	25	75	100
	Paper-III	Optional subject (Guide paper)	3	4	25	75	100
II		*Dissertation Evaluation		8	50	100	150
		Viva voce		4			50
		Total		**24**			**500**

* For 200 Makrs

Examinations:

Question paper pattern for M.Phil Zollogy Course.

Time : 3 Hrs. Max. 75

Part A –(5x5=25 Marks)

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

Part B- (5x10= 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**	**=**	**5 Makrs**
2.	**Assignment/Seminer**	**=**	**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.

PERIYAR UNIVERSITY, SALEM – 636 011

M.PHIL., DEGREE COURSE

ZOOLOGY

SYLLABUS WITH EFFECT FROM 2012 – 2013

PART – I – CORE – I : RESEARCH METHODOLOGY

(Syllabus)

Unit I : Principles and Applications – I

Microscopy

Light Microscopy – Phase contrast Microscopy – Electron Microscopy (SEM & TEM).

Separation & Analytical Techniques

Thin layer chromatography – Column Chromatography – Gas Liquid Chromatography – High Performance Liquid Chromatography (HPLC). Colorimetry – Spectrophotometry – Atomic absorption Spectrophotometry. Clinical centrifuge & Ultracentrifuge.

Unit II : Principles and Applications II

Electrophoresis – Immuno Electrophoresis. Tracer techniques – Geiger Muller counter – Scintillation counter – Autoradiography – Cytophotometer & Flow cytometer.

Unit III : Histological & Histochemical Methods

Histological preparation of tissues for Electron Microscopy (SEM & TEM) – Histochemical techniques – Proteins – Carbohydrates – Lipids – Enzymes & DNA.

Unit IV : Data processing and Analysis

Biostatistics : frequency distribution : 't' test; Chisquare test, "F" test; ANOVA– one way; two way and multiple way; Correlation co-efficient; simple linear regression; Regression analysis.

Computer science

Introduction to computers and their application in Biology : Operating System (WINDOWS – WORD, EXCEL, POWERPOINT) COMPUTER NETWORKS AND WORLD WIDE WEB – Internet – E-Mail. Biological Databases – Database Management system – Information retrieval – use of computer for statistical analysis.

Unit V : Research – Manuscript Preparation

Identification, selection & scope of research problems – Methods of literature collection & review. Planning & execution of investigation. Thesis writing – Preparation & presentation of research CORE for journals, conferences – Preparation of short communications & review articles.

Reference

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6. CLARK, G.L. (1961) : The Encyclopedia of microscopy, Reinhold publishing corporation, New York.
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14. NERNBURG, S.T. (1966) : Electrophoresis; Practical Lab, Manual F.A. Davis Company – Philadelphia.

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26. NARAYANAN, P. (2003) : Essentials of Biophysics, new age International (P) Ltd Publisher.

27. VASANTHA PATABHI, GAUTHAM, N. (2005) : Biophysics, Narosa Publishing House.

28. DANIEL, M. (2004) : Basic Biophysics, Published by Mrs. Saraswati, Purohit for student Edition, Jodhpur, India.

29. ALLEXIS LEON and MATHEWS LEON (1999) : "Fundamentals of information technology", LEON VIKAS, Chennai.

30. RAJARAMAN, V. (1992) : Fundamentals of computers, 8th Edition, prentice Hall of India, Private Ltd., New Delhi.

M.PHIL., ZOOLOGY

SYLLABUS WITH EFFECT FROM 2012 – 2013

PART – I – CORE – II : RECENT ADVANCES IN ZOOLOGY

(Syllabus)

Unit I : Environmental Science

Pollution and pollution management of aquatic ecosystem Ecosystem dynamics and management; stability and complexity of ecosystems; speciation and extinction; Environmental impact assessment; principles of conservation; conservation strategies; sustainable development. Population growth and food security. Impact of genetically modified food and human health.

Aquatic biota; productivity and biodegradation in different aquatic ecosystems; fish and fisheries of India with respect to the management of estuarine, coastal water systems and man made reservoirs; biology and ecology of reservoirs. Biodiversity – "The natural biological capital of the earth" – loss of biodiversity – conservation in India.

Unit II : Cell and Molecular Biology

Structure and organization of membranes, Glycoconjugates and proteins in membrane systems; ion transport, Na/K pase; molecular basis of signal transduction in bacteria, plants and animals, model membranes; liposome's; principles and application of light, phase contrast, fluorescence, scanning electron microscope fixation and staining. Biology of cancer.

Microbiology

Microbial fermentation; antibiotics, organic acids and vitamins. Microbes in decomposition and recycling processes; symbiotic and asymbiotic N_2 – fixation; microbiology of water, air, soil and sewage; microbes as pathological agents in plants, animals and man; General design and applications of a biofermentor, biofertilizer.

Unit III : 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; Platonism of immune response and generation of immunological diversity; genetic control of immune response, effector mechanism; applications of immunological techniques. Structure and pathogenesis of HIV.

Biochemistry

Vander – Waal's equation - hydrogen bonding and hydrophobic interaction; primary structure of proteins and nucleic acids; conformation of proteins of polypepotides (secondary, tertiary, quaternary and domain structure) reserve turns and Ramachandran plot, structural polymorphism of DNA, RNA and three dimensional structure of tRNA; structure of carbohydrates, polysacharides, glycoproteins and peptido-glycans; helixecoil, transition. The law of DNA constancy and c-value paradox.

Unit IV : Biotechnology

Cell and tissue culture in plants and animals; primary culture; cell clones; callus cultures; somaclonal variation; micropropagation, somatic embryogenesis; Haploidy; protoplast fusion and somatic hydridization; hybrids; Gene transfer methods in plants and animals; transgenic biology; Allapheny; Artificial seeds; hybridoma technology.

Principles and techniques of nucleic acid hybridization and cot curves; sequencing of proteins and nucleic acids; southern, Northern and South – Western blotting techniques, polymerase chain reaction; methods for measuring nucleic acids.

Units V : Biophysics

Principles of biophysical methods used for analysis of biopolymer structure. X-ray diffraction, fluorescence, UV, ORD/CD, visible NMR and Esr spectroscopy; hydrodynamic methods; atomic absorption and plasma emission spectroscopy.

Principles and applications of tracer techniques in biology; radiation dosimetry; Radioactive isotopes and half life of isotopes; Effect of radiation on biological system; autoradiography; Cerenkov radiation; liquid scientillation spectrometry.

Reference book

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2. BONEY BOYER, F. (1987) : Modern Experimental Biochemistry, Addition – Welsely publishing company – Massachusetts, California.
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12CMPZO 01

(For the candidates admitted from 2012 – 2013 onwards)

MODEL QUESTION PAPER FOR M.Phil., ZOOLOGY (THEORY)

M.Phil. DEGREE EXAMINATION

ZOOLOGY

PART – I - CORE – I – RESEARCH METHODOLOGY

Time : Three Hours Maximum : 75 Marks

Part A –(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 300 words. All questions carry equal marks.

1. a. Describe the compound microscope.
   (or)
   b. Differentiate between compound microscope and phase contrast microscope.

2. a. Write the principle and application of scientillation counter
   (or)
   b. Write a note on auto radiography with reference to its biological application.

3. a. Explain the purpose of fixation and types of chemical fixatives.
   (or)
   b. Describe the embedding procedure for electron microscopy and light microscopy.

4. a. Explain in detail about t-test with suitable illustration.
   (or)
   b. State the biological application of chi-square test.

5. a. Critical review of literature is essential for carrying out research-Justify.
   (or)
   b. Suggest a format for writing an article in the scientific journal.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 1000 words. ALL questions carry equal marks.

6. a. Explain the principle, mechanism and application of High Performance Liquid Chromatography (HPLC).

(or)

b. Give an account on the principle, structure, types and application of chromatography.

7. a. Write the principle, techniques and application of immuno electrophoresis.

(or)

b. Explain the principle and working procedure of flow cytometer with illustration.

8. a. Explain in detail the technique for preparing slides for electron microscope examination.

(or)

b. Describe the histochemical techniques for carbohydrates and lipids.

9. a. Discuss the advantages of using computer softwares in scientific research.

(or)

b. What is ANOVA? Explain it with suitable illustration.

10. a. How is research work designed? Discuss it.

(or)

b. Describe the method of writing a thesis.

12CMPZO 02

(For the candidates admitted from 2012 – 2013 onwards)

MODEL QUESTION PAPER FOR M.Phil., ZOOLOGY (THEORY)

M.Phil. DEGREE EXAMINATION

ZOOLOGY

PART – I - CORE – II – RECENT ADVANCES IN ZOOLOGY

Time : Three Hours Maximum : 75 Marks

Part A –(5x5=25 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 300 words. All questions carry equal marks.

1. a. Critically comment on the methods and objectives of environmental impact assessment.

   (or)

   b. Explain microbial degradation of oil, plastics and pesticides in aquatic ecosystems.

2. a. Describe any one model membrane.

   (or)

   b. List out the properties of cancer cell.

3. a. Explain the functions of class I MHC.

   (or)

   b. Give an account on hydrophobic interaction.

4. a. What is hybridoma technology? Write the application of it.

   (or)

   b. Write a note on artificial seeds.

5. a. How do you calculate half-life of an isotope?

   (or)

   b. Evaluate the concept of absorption spectra.

Part B- (5x10=50 Marks)

Answer ALL question choosing either 'a' or 'b' Each answer not exceeding 1000 words. ALL questions carry equal marks.

6. a. Give an explanation of fisheries development in India

(or)

b. Write a detailed account on biodiversity.

7. a. Write the commercial production of penicillin. Write is significance in medical field.

(or)

b. Explain about the symbiotic nitrogen fixation with suitable examples.

8. a. Write an essay on the classification and distribution of immunoglobulins.

(or)

b. Explain the three dimensional structure of RNA with neat diagram.

9. a. Give a detailed account on PCR and its applications.

(or)

b. Describe the western blotting technique and its applications.

10. a. Explain the principle and applications of tracer techniques in biology.

(or)

b. Write the mechanism and applications of Nuclear Magnetic Resonance (NMR).