SAURASHTRA UNIVERSITY

RAJKOT

(ACCREDITED GRADE "A" BY NAAC)

FACULTY OF SCIENCE

Syllabus for

M.Phil. (ZOOLOGY)

Choice Based Credit System

With Effect From: 2018-19

DEPARTMENT OF BIOSCIENCES

SAURASHTRA UNIVERSITY
RAJKOT – 360 005

Programme Outcomes of M. Phil. in Zoology

PO - 1 : Critical Thinking

Recognize and think critically towards the science curricula with sound knowledge and theoretical skills by questioning and plausible explanations.

PO - 2 : Social Interaction

Motivate and develop an interest in planning and implementation of research.

PO – 3 : Core academic skills

Handle equipment needed for material preparation, characterization and to analyze and interpret the data with theoretical background and software. Practice the teaching-learning process by being the proponent in classroom and laboratory experience.

PO-4 : Research and Development

Students will be able to demonstrate skills to handle biochemical and molecular techniques to plan and carry out experiments. They will be able to demonstrate skills in analyzing data, testing of hypotheses using statistical software's and arrive at conclusions drawn from experimental data.

PO-5 : Communication Skills

Communicate effectively with scientific community and with Society at large. Comprehend and write effective report documentation and presentations. Effectively disseminate technical information using written progress report, strategic report, scientific communication and operations.

PO – 6 : Continuous Learning

Recognize and integrate life-long learning skills to become pro-active in personal and professional live.

Programme Specific Outcomes of M. Phil. in Zoology

PSO-1 : Understand the current state of Biochemistry in their area of specialization.

PSO-2: Formulate a hypothesis and conduct research using appropriate tools and techniques with in their focused area of study.

PSO-3 : Communicate research results in Written and Oral Format.

PSO-4: Recognise the need for the preparation and ability to carry out an independence research in broadest context of subject relevance.

PSO -5: Publication of their results from the research work in the peer reviewed journals to benefit the society and carrier in research.

M. Phil. Zoology Syllabus
Choice Based Credit System (CBCS)
(Total 24 credits)

M.Phil. Zoology

SEMESTER I

Subject Code	Title of the Course	Cource Credits	No. of Hrs. Per Week	Weightage For Internal Examination	Weightage For Semester End Examination	Total Marks	Duration of Semester End Exam in Hrs.
Course 1 (Core)							
M.Phil. Zool-101	Paper-1 Methods in Ecology & Environment (Core)	4	4	--	100	100	3
M.Phil. Zool-204	Dissertation -I*	8	0	--	Evaluation by External and Internal examiners in a Viva-Voce. M.Phil. completion Notification and Certificate will be issued by Uni.	--	--

M.Phil. Zoology

SEMESTER II

Subject Code	Title of the Course	Cource Credits	No. of Hrs. Per Week	Weightage For Internal Examination	Weightage For Semester End Examination	Total Marks	Duration of Semester End Exam in Hrs.
	Course -2 (Elective) Any ONE						
M.Phil. Zool-202	Physiology	4	4	--	Evaluation by the RAC of the Department based on assignments and/or seminar/presentations and theory examination conducted by Department	100	3
M.Phil. Bot-203	Wildlife and Conservation	4	4	--		100	3
M.Phil. Zool-204	Dissertation -II*	8	16		Evaluation by External and Internal examiners in a Viva-Voce. M.Phil. completion Notification and Certificate will be issued by Uni.	200	

*Dissertation will commence in the beginning of the first Semester but will be evaluated and grade points will be given in the Final Semester.

M. Phil Programme in Zoology

Duration: Minimum of 2 Semesters and maximum 4 Semesters
Components of the Progrmme: (a) M. Phil. Course Work (b) Core & Elective courses and (c) M. Phil. Dissertation

Details of M. Phil. Syllabus:

Two (one Core paper in first semester and one Elective paper in second semester).

Credit : Each Course will be of 4 credits in 4 h/week/Sem. 08 Credits
Dissertation: 16 hours/week/Sem. For 2 Sems. 16 Credits

Total 24 Credits

Marks : Each course is of 100 marks 200 Marks
Dissertation 200 marks (100 thesis & 100 Viva) 200 Marks

Total 400 Marks

M. Phil. Programme Structure

As per Ministry of Human Resource Development, UGC New Delhi, Notification 5th May, 2016, (Minimum Standards and Procedure for award of M.Phil. / Ph.D. Degrees) Regulation – 2016, (SU Ordinance Circular No. PGTR/PhD/1/254/2017, dated 25-1-2017)

CHOICE BASED CREDIT SYSTEM (CBCS)

(Total 24 Credits)

COURSE	PAPER NAME	HOURS / WEEK	CREDIT	MARKS
SEMESTER - I				
Coursework	**M.Phil. Zoology Course Work (Research Methodology)**	8	8	
	Paper – 1 (Core)			
M.Phil.Zool-101	Methods in Ecology & Environment (Core)	4	4	100
M.Phil.Zool-204	Dissertation – I*		8	
	SEMESTER TOTAL		**12**	**100**
SEMESTER - II				
	Paper – 2 (Elective) Any ONE	4	4	100
M.Phil.Zool-202	Physiology			
M.Phil.Zool-203	Wildlife & Conservation			
M.Phil.Zool-204	Dissertation – II*	16	8	200
	SEMESTER TOTAL	20	12	300
	GRAND TOTAL	**40**	**24**	**400**

*Dissertation will commence in the beginning of the first Semester but will be evaluated and grade points will be given in the Final Semester.

M. Phil. Programme in ZOOLOGY

SEMESTER – I

M.Phil. Course Work: 8 Credits

Zool-101: METHODS IN ECOLOGY & ENVIRONMENT (Core)

OBJECTIVES:

This course focuses on the diversity of living forms particularly animals with a detailed inference on the loss of species due to various reasons and the need of their conservation. It will give a brief introduction to the atmosphere and ocean circulation. Interaction between biomes can be understand by this course content.

COURSE OUTCOME:

CO-1: Develop understanding on the concept and issues of global environmental change.
CO-2: Analyse the causes and effects of depletion of stratospheric ozone layer.
CO-3: Examine the climate change and its effect on living beings.
CO-4: Understand the physical basis of natural green gashouse effect on man and materials.
CO-5: Evaluate human influenced driver of our climate system and its applications.
CO-6: Know the biotic and abiotic components of ecosystem.
CO-7: Food chain & food web in ecosystem.
CO-8: Understand diversity among various groups of animal kingdom.
CO-9: Understand Animal community & ecological adaptation in animals.
CO-10: Scope, importance and management of biodiversity.
CO-11: Engage in field-based research activities to understand well the theoretical aspects taught besides learning techniques for gathering data in the field.
CO-12: Analyse a biological problem, derive testable hypotheses and then design experiments and put the tests into practice.
CO-13: Solve the environmental problems involving interaction of humans and natural systems at local or global level.

Unit-1: Methods in Biodiversity & Biosystematics

1.1 Classical Taxonomy, Molecular Taxonomy
1.2 Sampling and sampling techniques
1.3 Animal diversity, Diversity indices
1.4 Animal distribution

Unit – 2 : Methods in Population Ecology

2.1 Population types
2.2. Population dynamics
2.3 Field Sampling and sampling techniques
2.4 Measurements of population indices.

Unit – 3 : Community Ecology

4.1 Community concept, structure, Keystone species

4.2 Community Indices, Assemblage & Assemblage structure
4.3 Terrestrial communities
4.4 Wetland and Marine communities

Unit - 4. Environmental Pollution & EIA

4.1. Environmental Pollution, EIA: Monitoring Methods & techniques
4.2. Risk assessment selection methods, experimental design.
4.2 Bioassay Methods
4.3 Toxicity assessment methods

SEMESTER – II

Paper -2 (Elective: any ONE of the following)

Zool-202 : PHYSIOLOGY

OBJECTIVES:

The course deals with various physiological functions in mammals. It also gives an account of the metabolic/ biochemical pathways and the probable impact of environment on them.

COURSE OUTCOME:

CO-1: Understand the Importance of physiology and branches of it.
CO-2: Understand the terms-Osmosis, diffusion, pH and Buffer.
CO-3: Understand the Digestion and Excretion process, by studying the organs of it.
CO-4: Understand the process of Metabolism.
CO-5: Understand the term Detoxification.
CO-6: Understand the Circulatory system and Lymphatic system.
CO-7: Study the nervous system.
CO-8: Understand the process of vision and hearing.
CO-9: Understand the process of muscle contraction.

Unit – 1. Physiology - I

1.1 Physiology of digestion
1.2 Thermoregulation & Osmoregulation
1.3 Cardio-vascular mechanisms
1.4 O_2 and CO_2 transport

Unit – 2. Physiology II

2.1 Physiology of excretion 2.2 Physiology of respiration:
2.3 Physiology of vision and hearing
2.4 Physiology of the sense of smell and taste.

Unit – 3. Neurobiology

2.1 Nervous system in invertebrates.
2.2 Nervous system in vertebrates, propagation of signals
2.3 Hypertension and hypertensive factors
2.4 Neurobiological disorders

Unit – 4. Endocrinology

4.1 Hormones and physiology of hormone action
4.2 Pituitary hormones, regulation and functions.
4.3 Endocrine pancreas and its hormones, regulation and functions.
4.4 Sex hormones, regulation and functions.

Zool - 203: WILDLIFE & CONSERVATION (Elective)

OBJECTIVES:

The course is an introduction to wildlife management and gives an account of the tools used by wildlife managers. Topics covered are to equip students with adequate knowledge of various biodiversity monitoring methodologies, conservation and management issues of vertebrate pests, wildlife conflict and over abundant species, wildlife health and diseases.

COURSE OUTCOME:

CO-1: Develop an understanding of how animals interact with each other and their natural environment

CO-2: Develop the ability to use the fundamental principles of wildlife ecology to solve local, regional and national conservation and management issues

CO-3: Develop the ability to work collaboratively on team-based projects

CO-4: Demonstrate proficiency in the writing, speaking, and critical thinking skills needed to become a wildlife technician

CO-5: Gain an appreciation for the modern scope of scientific inquiry in the field of wildlife conservation management

CO-6: Develop an ability to analyze, present and interpret wildlife conservation management information.

Unit-1: Wildlife

1.1 Wildlife, its depletion and causes
1.2 Wildlife conservation and its importance
1.3 Wildlife (Protection) Act 1972
1.4 Protected areas

Unit – 2: Biodiversity & Endangered Wildlife

2.1 Natural Parks
2.2 Sanctuaries
2.3 Endangered wildlife
2.4 Project Tiger, Wildlife Trade, CITES

Unit – 3: Wildlife Management

3.1 Wildlife management, Strategies of wildlife management,
3.2. Equipments & Methods being used for wildlife management
3.2 Damage by animals, conflict and solution
3.4 Government, NGO, Advisory bodies, Wildlife Institute of India, SACON etc.

Unit – 4: Habitat Ecology & Ethology

4.1 Habitat Ecology: types and functions
4.2 Ethology: Types of Ethology & Ethogram
4.3 Animal behaviour : Classification
4.4. Field methods and analysis