BERHAMPUR UNIVERSITY

Bhanja Bihar, Berhampur-760007, Ganjam, Odisha

Courses of Studies

For

M.Phil/Pre-Ph.D Course in Zoology Examination-2017

M.Phil/Pre-Ph.D. Course work

First Semester

Core Course-1: Research Methodology	**04 Credits**
Core Course-2: Advance Studies in Zoology	**04 Credits**
Core Course-3: Review of Literature and Seminar Presentations	**04 Credits**
Elective Course: Advances in Environmental Sciences	**04 Credits**

Second Semester

Core Course: 4-Seminar and Pre-Submission Presentations	**04 Credits**
Dissertation:	**12 Credits**

Total Credit Points: 32 Credits

FIRST SEMESTER

Core Course-1

Research Methodologies; Tool and Technique in Biological Sciences

(04 Credits)

Unit-I

- Theoretical frequency distribution and test of Significance
- Probability distribution
- Correlation and regression
- ANOVA

Unit-II

- Microscopy (Phase, Fluorescent and Electron)
- Centrifugation technique for separation of Biological samples
- Spectroscopy
- Electrophoresis

Unit-III

- Partition Chromatography technique (Paper, TLC)
- Adsorption chromatography (Gel, Ion-exchange)
- Immunological techniques (RIA, ELISA)
- HPLC and Gas-liquid Chromatography

Unit-IV

- Gel Documentation
- PCR: Principles and Application
- Blotting (Southern and Northern)
- FISH and GISH

Core Course-2

Advance Studies in Zoology

(04 Credits)

Unit-I

- Human genome project
- Ribozyme technology
- Epigenetic modifications and their function in regulating gene expression
- Epigeneticsand the environment

Unit-II

- Cell-cell communication in development
- Membrane pumps, carrier and channels
- Cellular Communication
- Protein trafficking in nuclear membrane

Unit-III

- Hematopoietic stem cells: Clinical use and prospective
- Cell mediated effected function
- B-cell generation; activation and differentiation
- Cancer immunotherapy

Unit-IV

- Physiology of Vision
- Thermoregulation in vertebrates
- Human nutrition and associated hazards
- Oxidative stress

Core Course-3

Review of Literature and Seminar Presentation

(04 Credits)

- Review of Literature: meaning, significance and techniques of reviewing the literature for the specific topic/research paper
- Developing guidelines for review of literature
- Selecting Five research papers on any topic of Zoology/Bioscience and reviewing all
- Preparing a report on the reviewed papers- at least 05 research papers
- Presenting the research reviewed papers through PPT

Evaluation:

The candidate has to present his/her paper through PPT before the Department RAC and submit a report after the presentation. The department RAC will evaluate each report and overall grade secured by the candidate will be done based on the presentation and report.

Core Elective-1

Advances in Environmental Sciences

04 Credits

Unit-I

- Ecological tool and techniques
- Laws of thermodynamics, energy flow and mineral cycling
- Population dynamics
- Community ecology

Unit-II

- Environment and human health due to Hazardous chemicals and use of pesticides
- Oil spills; nuclear waste and its biological impact
- Sustainable development; Indian environmental laws and its regulation
- Environmental impact assessment

Unit-III

- Biodiversity: International and National efforts for its conservation
- Global climate change and associated laws
- Ex-situ and In-situ efforts in conservation of wild life
- Genetically Modified and associated issues

Unit-IV

- Bio fuel
- Biological pest management
- Bioremediation
- Vermi-composting

Core Elective-2

Advances in Entomology

04 Credits

Unit-I

- Fossil insects
- Insect classification upto order with examples
- Evolution of Insects.
- Collection and mode of preservation of insects

Unit-II

- Lac culture
- Apiculture
- Sericulture
- Insect Pathology (Viral/Bacterial/Protozoan)

Unit-III

- Morphology, Bionomics and Management of pests of vegetables and stored grains
- Morphology, Bionomics and Management of pests of paddy, wheat and sugarcane
- Morphology, Bionomics and Management of pests of oil-seed crops and pulses
- Integrated pest management

Unit-IV

- Morphology of mosquitoes
- Morphology of houseflies
- Method of transmission of parasitic agents
- Integrated vector management

SECOND SEMESTER

Core Course-4

Seminar and Pre-Submission Presentations

(04 Credits)

This paper includes four (04) presentations based on the M.Phil dissertation carrying one credit points per presentation and report to be done every month (From 2nd month onwards) during the period.

Unit-I: Presentation of research proposal

Unit-II: Presentation on Review of Literature on the proposed topic

Unit-III: Presentation on Methodology and plan of research

Unit-IV: Final/Pre-Submission presentation

Evaluation:

The candidate has to present his/her paper through PPT before the Department RAC and submit a report after the presentation. The department RAC will evaluate each report and overall grade secured by the candidate will be done based on the presentation and report

Dissertation

(12 Credits)

Recommended Text Books for M.PhilZoology

Non-Choradata

Sl.No	Author'sName	Title of thebook	Publisher
1	Hyman,L.H.	The Invertebrates Vio.I toVII	Mc GrawHill
2	Shipley	Cambridge NaturalHistory (Vol1 to10)	CambridgeBus
3	Sedgwich	A Student's Text Bookof Zoology(Vol-1-3)	CentralBook Depot
4	Lankaster	A Tratise onZoology	CharlesBlack
5	Branes, R.D	InvertebrateZoology	Saunders
6	Barrington,E.J.M	Invertebrate structure& function	Miffin&Elbs
7	Meglitsch,P.A.	InvertebrateZoology	NYOUP
8	Russel,W.D. Hunter	Biology ofHigher Invertebrates	Macmillan
Choradata			
1	Young,J.R.	The Life ofVertebrates	Oxford Univ.Press
2	Parker &Haswell	Text Book of ZoologyII	Simona Pvt.Ltd. Bombay
3	Goodrich	Structure andDevelopment of Vertebrates Vol I &II	DoverPublications
4	Romer	VertebrateBody	ChicagoUniv.
5	Romer	VertebratePaleontology	ChicagoUniv.
6	Noble	Biology ofAmphibia	Dever
7	Langer *etal*	Icthyology	Jhon Wiley &Sons
8	Best &Taylor	The LivingBody	Henry HoltCo.
9	Ballarisand Attridge	Reptiles	HutinsonUniv. LibraryLondon.
Ecology			
1	Odum,E.P	BasicEcology	SaunderCollege Pub. NewYork.
2	Odum,H.T.	System Biology-An Introduction	John Wiley &Sons
3	Hutchinson,G.E.	An Introduction toPopulation Ecology	Yale Univ.Press
4	Pielon,B.C	Population &Community Ecology: Principles& Method	Gorden&Breach, NewYork

5	Wilkinson,D.M.,	Fundamental Processin ecology: An Earthsystem Approach	OxfordUniv. Press,U.K
6	Grant,W.E.and Swannack,T.M.,	EcologicalModeling	Blackwell

Embryology		
Balinsky	An introduction toEmbryology	SaundersCollege Publishing
Waddington	Principles ofEmbryology	GeorgeAllen
Deuchar,E.M.	Cellular interaction inanimal development	Champama&Hall
ScoltGilbert	DevelopmentBiology	SinauerAssociates, Inc.,Publishers
J.M.W.Slack	Essentials of DevelopmentalBiology	
LouisWolpert	Principles of DevelopmentalBiology	
Scott F.Gilbert &Epel	Ecological DevelopmentalBiology-Integrating epigenitics, medicineand evolution	

Molecular Cell Biology			
1	Cooper, DeRobetis & DeRobeti ;	Cell andMolecular Biology	SaundersInternational Edition
2	-do-	Essentials of Celland MolecularBiology	-do-
	C.J. Hurst *etal.*	Manualof Environmental Microbiology	ASMpress
	J.G.Cappucino*etal*	Microbiology	Pearson EditionPublication
3	Saustad&Simons	Principles ofGenetics	John Wiley &Sons
4	GeraldKarp	Cell &Molecular biology	John Wiley &Sons
5	Striekberger,M.W.	Genetics	Mac Millan Pub.Co.
6	Lewin,B.	Genes (LatestEdn.)	John Wiley &Sons
7	StuartHogg	EssentialMicrobiology	John Wiley &Sons
7	Lodish*etal.*	Mol. CellBiology	W.H.Freeman&Company
8	Watson, J.D. *etal.*	Molecular Biologyof theGene	TheBenjamin/Commings Publishing
9	-do-	Recombinant DNAA shortCourse	-do-