

BHARATHIAR UNIVERSITY COIMBATORE
M.Sc. ZOOLOGY (WILDLIFE BIOLOGY) COLLEGES – CBCS PATTERN
(For the students admitted during the academic year 2015 -16 Batch & onwards)

Note: The revised syllabi for the following papers furnished below be followed and there is no change in the existing scheme of examination and syllabi of remaining papers.

Paper IX
VERTEBRATE BIOLOGY & CONSERVATION

Unit I

Taxonomy & Identifying Characters of Fishes, Amphibians and Reptiles (up to orders). Fish migration- Hill stream adaptations. Parental care in amphibians & Fishes – Poisonous & Non poisonous snakes – Economic importance of Reptiles & fishes.

Unit II

Taxonomy & Identifying Characters of Birds (up to orders) and Mammals (up to family) with examples. Migration of birds – Bird watching – Feet and beak modifications – Nesting behavior –Endemic birds of Western Ghats- Economic value of birds

Unit III

Endemic & endangered mammals in India & Conservation. Breeding biology & feeding ecology of Felids, Elephants, rhino, primates, and bats – Economically important mammals.

Unit IV

Biosphere reserves in India – Sanctuaries and National park in India – Project tiger, elephant, lion & hangul. Ecotourism – Wildlife Protection Act & amendments.

Unit V

Zoo Management - Animal exhibits design & signage - Animal handling, transport & training - food and feeding - National zoo policy - Diseases of zoo animals- their prevention and cure- zoo sanitation; Marketing.

References:

1. Romulus whitaker & Ashok captain, Snakes of india: the field guide, Natraj Publications
2. Indraneil Das, Snakes and other reptiles of India Natraj Publications
3. S.H. Prater, The book of Indian animals Natraj Publications
4. A thangamani, S Prasanna kumar, L M Narayanan, N Arumugam Chordate Zoology, Saras publication
5. Ekambaranathan Iyer & Anantha Krishnan Manual of Zoology
6. Salim Ali, Book of Indian Birds, Bombay natural Historical Society
7. Chinna Sathan & Bal Pandey, The Nesting behaviour of Indian Birds Sugeeth Publications
8. Saharia V B, 1982. Wildlife in India, Natraj Publishers, Dehra Dun.
9. P.C. Sinha, Wildlife and forest conservation Anmol Publications
10. Anand S. Khati, Indian National Parks and Sanctuaries, Pelican Creations

PAPER –X- Forestry, Silviculture and Entomology

Unit I

Natural and artificial regeneration of forests - nursery and planting techniques. Clear felling, uniform shelter wood selection, coppice and conversion systems. Silviculture management - Mangroves- Cold desert & Plantation . Tree improvement & Seed Technology – Non timber forest products – Wood seasoning and preservation - Anatomical structure of wood, defects and abnormalities of wood, timber identification

Unit III

Forest management techniques - Methods of measuring - diameter, girth, height and volume of trees - form-factor - volume estimation of stand Sampling methods and sample plots. Yield calculation - forest cover monitoring through remote sensing - GIS management and modeling - Forest survey - map reading.

Unit IV

Forest types in India, identification - dendrology, Establishment of herbaria and arboreta. Agro forestry systems - Social/Urban Forestry – Joint Forest Management. Watershed management - Deforestation & Impacts. Forest Inventory.

Unit V

Classification of insects up to order with example. Feeding and reproductive behaviour of insects, Forecasting, assesses risk of insect outbreaks. Insect Management - Insect Plant interaction.

References

1. Agarwala V P, 1980. Forests in India. Oxford and IBH Publishing Co., New Delhi.
2. Puri G S, Meher V M, Gupta R K and Puri S, 1981. Forest Ecology. Oxford and IBH Publishing Co., New York.
3. Stebbin E P, 1977. A Manual of Elementary Forest Zoology For India. International Book Distributors, Dehra Dun.
4. Sukachev V and Dlis N, 1964. Fundamentals of Forest Biogeocoenology, Oliver and Boyd, Edinburgh.
5. Tiwari K M and Singh R V, 1980. Social Forestry Plantations. Oxford and IBH Publishing Co., New Delhi.
6. Warning R H and Schlesinger W H, 1985. Forest Ecosystems: Concepts and Management. Academic Press, New York.
7. Imms A D, 1965. A General Textbook of Entomology, ELBS, London.
8. Lefroy H M, 1909. Indian Insect Life. Today and Tomorrow's Printers and Publishers, New York.
9. Metcalfe C L and Flint W P, 1973. Destructive and Useful Insects, McGraw-Hill, New York.
11. Stebbins E P, 1965. Indian Forest Insects of Economic Importance. Eyre and Spottiswords Ltd., Loncon.

PAPER XI- WILDLIFE MANAGEMENT TECHNIQUES

Unit I

Making observations and records – field notes & datasheets - Planning wildlife management Investigations and projects – funding agencies. Wildlife Photography - types of cameras & binoculars - camera traps – altimeter – pedometer - field compass. Sound recording & Media players - activity recording - weight measurement.

Unit II

Radio isotopes - radio collaring – GPS – GIS & Remote sensing. Q GIS – Map Info –Arch view (outlines only). Molecular methods in Wildlife

Unit III

Planning census – sample counts – Block counts – Roadside counts – Dung count – Pugmark & waterhole census – Identifying animals based on indirect signs – Capture recapture techniques – tiger, co-predator monitoring census methods. – Distance software – Creation of capture matrix and softwares used in wildlife sciences

Unit IV

Survey & mapping water sources – rain gauge setting – supplementary water source – providing access to natural & artificial water sources –Fire as a tool. Wildlife damage control – assessment methods – reasons for conflicts – Fences – trenches & other methods – Human pressure classification – Trail survey in boundary – Forest product collection – Village survey – Anti poaching operations –VFC.

Unit V

Chemical restraints: Advantage & Disadvantage – Basic considerations –safe usage – Drug delivery – syringes & darts – ideal drugs - classes, properties – planning operation – Chemical restraints of Elephant, rhino, Gaur, Sambar, Panthera, small herbivores – post capture medical care & treatment. Wildlife health monitoring – Postmortem.

References

1. Dasmann R F, 1964. Wildlife Biology, John Wiley & Sons, New York, p 231.
2. Gilas R H Jr.(ed.), 1984. Wildlife Management Techniques, 3rd ed. The Wildlife Society, Washington D.C., Nataraj Publishers, Dehra Dun, p 547.
3. Robinson W L and Eric G Bolen, 1984. Wildlife Ecology and Management, Maxmillan Publishing Company, New York, p 478.
4. Rodgers W A, 1991. Techniques for Wildlife Census in India - A Field Manual: Technical Manual - T M - 2. WII.
5. Saharia V B, 1982. Wildlife of India, Nataraj Publishers, Dehra Dun.
6. Teague R D (ed.), 1987. A Manual of Wildlife Conservation (The Wildlife Society, Wsashington D.C.). Nataraj Publishers, Dehra Dun, p 206.
7. WII. A Guide to Chemical Restraint of Animals.

PAPER –XII- ETHOLOGY

Unit I

Instinctive behaviour-classical and modern concepts-fixed action pattern and ritualization. Learning-Imprinting-habituation. Analysis of behaviour pattern- taxis, kinesis and reflexes.

Unit II

Physiological mechanism of behaviour – Perceptual mechanism - Role of hormones - pheromones -predator detection, predator tactics. Altruism and evolution- Methods of studying behavior.

Unit III

Biological rhythms. Animal communication in Mammals, Birds and Insects. Foraging behaviour. Origin and significance of play.

UNIT IV

Courtship, display - sexual selection - pair bond - sexual dimorphism - polymorphism - polyandry, polygamy - promiscuity - cooperative breeding - brood parasites – parental care in Mammals & Birds.

Unit V

Aggression – Competition – Social spacing – Territory – Dominance. Social commensalism – mutualism – Parasitism . Social behaviour of elephants and lion.

References

1. Leshner A I, 1978. An Introduction to Behavioural Endocrinology, Oxford University Press, New York.
1. Mc Farland D (ed.), 1981. The Oxford Companion to Animal Behaviour, Oxford University Press, Oxford.
2. Ridley M, 1968. Animal Behaviour - A concise Introduction , Blackwell Scientific Publications, Oxford.
3. Slater P J B, 1985. An Introduction to Ethology, Cambridge University Press, Cambridge.
4. Wallace R A, 1979. The Ecology and Evolution of Animal Behaviour, Goodyear Publishing Company Inc., Santa Monica, California.
5. Wilson E O, 1978. Sociobiology, The Belknap Press, Harvard University Press, Cambridge, MA.
6. Devayani Khemka, Animal Behaviour, Dominant publishers.

Paper XIII Field Training

Unit I

Training of basic field techniques – inventories –survey – identification of fauna and flora – handling of basic wildlife instruments.

Unit II

Apprentice ship as a biologist in a Sanctuary/ National park / Tiger Reserve – collecting information about various administrative setup –preparation of plans /projects – disaster management – laws & regulations

Unit III

Training in conducting population survey / census –sign survey – transects – grids – vegetation analysis – herbivore abundance – covariance – occupancy – Habitat survey.

Unit IV

Training of Usage of camera traps / statistical techniques /softwares including capture recapture –matrix preparation – analysis using DISTANCE, CAPTURE, MARK or other software of relevance.

Unit V

Training in Analysis of data and preparation of report – Writing reports –presentation – Analysis of data – Ecological statistics – Boolean Algebrae – Boot strapping - Convex Polygons – Distribution analysis – Home range prediction - Habitat modeling – Prediction models & Projection of Data.

(At the end of the semester the candidate is evaluated internally by the HOD and senior faculty member. Mark allocation Report :20, Attendance:10, Performance in training: 20, Student evaluation:25)

Paper XIV GIS Training

Unit I

Training in usage of computer and internet – Various browsers – networking – accessing data – collection of literature & relevant data – Google earth – Various websites of GIS Importance

Unit II

Training in usage of Excel, Access and GPS

Unit III

Training in Q GIS

Unit IV

Training in Usage of Archview / Mapinfo

Unit V

Self preparation and submission of a GIS map

(At the end of the semester the candidate is evaluated internally by the HOD and senior faculty member. Mark allocation Report :20, Attendance:10, Performance in training: 20, Student evaluation:25)

Core Practical IV

(Collection of animals for identification is unethical, hence usage of photographs suggested)

1. Identification of fishes.
2. Identification of amphibians.
3. Identification of reptiles.
4. Identification of birds.
5. Identification of Mammals.
6. Identification of birds and animals based on call / cry/ roar or sound.
7. Identification of individual elephants based on morphology.
8. Identification of feeding habit of fish based on position of mouth.
9. Identification of feet and beak modification in birds.
10. Identification of Nest and nesting behavior in Birds.
11. Study of troupe / heard composition and sex identification in elephants, deer, monkeys, boar & Wild dogs.
12. Age determination based on exo-skeleton of Vertebrates (live animals should not be used).
13. Capture, Mark and Recapture Method (Colour beads may be used).

Submissions at the time of Practical Examination (Should not exceed 20% of total Marks)

1. Report of Photographic training
2. Checklist of Birds/Mammals/Reptiles/Amphibians/Fishes of a Locality
3. Report of Migratory birds/Nesting patter of a locality
4. Report of Nature camp

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Core Practical V

(Collection of insects for identification is unethical, hence usage of photographs suggested)

1. Identification of important Insects.
2. Identification of important butterflies.
3. Identification of plants of silviculture importance.
4. Preparation of quadrats and counting.
5. Invertebrate sampling protocols.
6. Construction of transect lines and sampling.
7. Estimation of Vegetation in an area.
8. Identification of various forest types.
9. Estimation of tree height.
10. Estimation of log volume.
11. Calculation of canopy volume.
12. Forest cover monitoring, forest map reading and surveying of forest area.
13. Focal animal sampling (Do not use caged animals instead videos are suggested)

Submissions at the time of Practical Examination (Should not exceed 20% of total Marks)

1. Report of Visit to a Social forestry area/Nursery.
2. Checklist of butterflies / insects / invertebrates of a locality.
3. Report of visit to a timber depot.
4. Report of sample survey of vegetation of a forest area.

Core Practical VI

1. Mapping of sanctuaries and National parks.
2. Identification of fecal parasites.
3. Designing of animal cages.
4. Designing of Zoo animal food preparation.
5. Presentation of animals in Zoo.
6. Marketing of ecotourism by preparing brochure.
7. Estimation of carrying capacity of a sanctuary.
8. Population Viability analysis.
9. Identification buffer areas for a sanctuary / tiger reserve.
10. Identification of elephant corridor.
11. Preparation of EIA.
12. Designing the interpretation centre in sanctuary.

Submissions at the time of Practical Examination (Should not exceed 20% of total Marks)

13. Report of case study of a sanctuary / National Park / Reserve.
14. Study Report of management and marketing of ecotourism from a reserve.
15. Training report of Zoo Management.
16. Report of visit to a Biosphere reserve with special emphasis to MAB programme or study report about a wet land ecosystem.

Core Practical VII

1. Identification of instruments of Wildlife importance.
2. Estimation of diversity and species richness of an area.
3. Usage of pedometer and field compass.
4. Usage of GPS.
5. Marking boundary of an area using GPS
6. Geo referencing of an image file to create vector image (Q GIS / Map info / Arch view).
7. Overlaying GPS points over vector image and construction of GPS (Q GIS / Map info / Arch view).
8. Estimating Population using Distance Software.
9. Map reading.
10. Recording angle of animal citation.
11. Population estimation by block counting.
12. Identification of indirect signs.
13. Pug mark tracing and sex identification.

Submissions at the time of Practical Examination (Should not exceed 20% of total Marks)

1. A survey report of indirect signs of a locality /reserve
2. GIS training report
3. A training report of various software's used in wildlife Biology
4. Report of participation in tiger census /animal census

M.Sc dissertation based a topic of Wildlife importance has to be submitted at the end of final semester and viva voce examination is an open presentation with the aid of multimedia (Dissertation 150 marks and Viva 50 Marks for Project).