Bharathiar University, Coimbatore 654 046.

B.Sc., Zoology (Wildlife Biology)
(Revised papers from the academic year 2013-14 onwards)

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

Semester – V Core Paper - V

Wildlife Management Techniques

Objectives: To make the students equipped with principles and applications of various wildlife management techniques


Unit II: Evaluation of Wildlife habitat: Define habitat – Forest habitat types - basic survey techniques of habitats – Vegetative analyses – Point centered quadrat, Quadrat, strip transect – Habitat manipulation: Food, Water, shade, impact and removal of invasive alien species

Unit III: Population Estimation: Basic concepts and applications - Direct count (block count, transect methods, Point counts, visual encounter survey, waterhole survey). Indirect count (Call count, track and signs, pellet count, pugmark, camera trap, DNA finger printing and aerial photography).

Unit IV: Human-animal Conflicts: Basic concepts, reason for conflicts, Identification of damages caused by wild animals and control measures. Case studies – Elephant, gaur, wild boar, monkey, tiger and leopard, Translocation of Wild animals – Principles, Methods and application.


References:
2. Seshadri, B. 1986 India’s Wildlife reserves, Sterling Pub’rs Pvt. Ltd., New Delhi
Semester – V Core Paper - VI

BIOLOGY OF VERTEBRATES

Objectives: To enable the students understand the basic principles, classification, diversity and adaptations of vertebrates

Unit I: Ichthyology: Diversity of fishes, Characteristics of Fishes with suitable examples, Food and feeding habits – breeding habits of fresh water fishes – Detailed study on mahaseer fish

Unit II: Herpetology: AMPHIBIA: Diversity, Characteristics of Amphibia with suitable examples, distribution and salient features of South Indian amphibians. Food and feeding habits – breeding habits – detailed study on Rhacophorus malabaricus

Unit III: REPTILIA: Diversity, Characteristics of Reptilia with suitable examples, distribution and salient features of South Indian reptiles. Food and feeding habits – breeding habits of Indian Lizards, snakes, turtles, tortoises and crocodiles. Key characters of venomous and non-venomous Snakes

Unit IV: Ornithology: Classification of Birds upto orders with suitable examples. Food and feeding habits – breeding habits and Adaptation of Indian birds: Coastal birds – Inland water birds – Birds of terrestrial, high altitudes and deserts. Biology of Bird migration.


Text book:
4. J.C. Daniel. Amphibians and Reptiles of India
5. Prater, Mammals of India

References

Semester – V Core Paper - VII
Conservation Biology

Objectives: To enable the students understand the need of conservation of wildlife in India.

Unit I: Introduction to conservation biology, the origin of conservation biology, ethical and economical values of conservation biology, definition of biodiversity, types of biodiversity, threats to biodiversity.

Unit II: Scopes and importance of conservation methods – In-situ and Ex-situ conservation approaches of Indian animals. Captive breeding (Lion-tailed macaque, white tiger and vultures) and reintroduction (Tiger, rhinoceros, gaur).


Unit V: Conservation Biology Tools - Biological Parks, Zoological Parks, Forest Research Institute, Agricultural Research Institutions, Gene Pools, Cryopreservation Centres, Interpretation Centres and role of Field Biologists.
References:

Semester – V : Elective - I
Eco-development and Ecotourism - I

Objectives: To make the students equipped with principles and applications of Eco-development Programmes.

Unit I: Definition and Principles of eco-development – Description for identification of areas– Criteria for area identification - identification of resource organizations – Baseline survey

Unit II: Participatory Rural Appraisal (PRA) exercise – History of the area - Collection of socio-economic details - Preparation of social map- Resource map- problem analysis and prioritization- addressing the problems-SWOT analysis


Unit IV: Formation of self help groups, Nature clubs and Eco clubs for students, Wildlife protection team – creation of alternative income generation activities – value addition and utilization of NTFP- Involvement in forest protection and gathering intelligence and information – awards and rewards

Unit V: Study on successful eco development areas – Case studies – Periyar Tiger Reserve and Kalakkad-Mundanturai Tiger Reserves - Monitoring and evaluation of eco-development programmes, data collection, analysis and interpretation, report writing and preparation of eco-development Plan

References
Eco Development- Towards a philosophy of environmental Education -Balasubramanian and Arun, Regional Institute of Higher Education, Singapore, 1984
Joint Forest Management- The Haryana Experience- Sarin Madhu, Centre for Environmental Education, Ahmedabad, 1996
Microplanning Manual for Joint Forest Management areas- Bahshih Singh, Varalekshmi, Tata Energy Research Institute, New Delhi, 1998
People and Protected Areas- Towards participatory conservation in India- Ashish Kothari, Neena Singh, Saloni Suri, Sage Publications, New Delhi, 1996
Participatory Rural Appraisal- Methods and Applications in Rural Planning- Amitava Mukherjee, Vikas Publishing House, New Delhi, 1995
Learning to share- Experiences and Reflexions on PRA and community participation- Neela Mukherjee & others, Concept Publishing Company, New Delhi, 1997
Participatory Rural Appraisal- Methodology and Application- Neela Mukherjee, Concept Publishing Company, New Delhi, 1993
Ecotourism- A guide for planners and Managers- Lidberg, Kreg etc, Natraj Publishers, New Delhi, 1999
Tourism and Development in India- Sunitha Chopra, Ashish Publishing House, New Delhi, 1991

Semester – V : Elective - II : Paper I

Aquatic Biology-I (Freshwater Biology and Estuarine)

Objectives: To make the students equipped with principles and applications of Fresh water and Estuarine Ecosystem.


Unit IV: Major threats to freshwater ecosystems, including pollution and sand mining. Impact of large dams and fragmentation on river ecology and fishery. Association of birds and other wildlife with wetland ecosystems.


References:
5. Sheeja and Ebanasar. 2006. Ecosystem dynamics of ponds and rivers in India. Shine and Twinkle pub.
Objective: To understand the principles and applications of Geographical Information System and Remote sensing techniques.

Unit I: Map reading – topo sheets – Google map – satellite imageries – contours, hilly areas, valleys, drainage, reservoirs, buildings, settlements, roads, trek paths, cultivated areas, state boundary, RF boundary

Unit II: Use and applications of Global Positioning System – way points, tracks, track back, survey – data conversion – data transfer softwares – Map Source, Garmin Basecamp

Unit III: Use and applications of GIS softwares – Quantum GIS, Map Info– importing data – digitizing layers – overlaying the layers in to topo sheets – creating titles and legends, direction and scaling.

Unit IV: Preparation of maps – location maps, drainage maps, vegetation maps, contour map, three dimensional maps, fire map, village map, route map, spacio and temporal distribution of wildlife maps

Unit V: Use of GIS and remote sensing in wildlife conservation – resource organizations – Survey of India, French Institute of Pondicherry

Reference text books:

Semester – VI Core Paper - VIII
Forestry and Silviculture

Objectives: To enable the students understand the scientific approach in Forestry management.

Unit I: Basics of Ecological and physiological factors influencing vegetation - natural and artificial regeneration - nursery and planting techniques - water budgeting - grading and hardening of seedlings - Clear felling, uniform shelter wood selection, coppice and conversion systems.


Unit IV: Forest types in India, identification of species, composition and associations; dendrology, taxonomic classification, principles and establishment of herbaria and arboreta. Survey techniques – GPS, Compass techniques, Restoration of shoal grassland ecosystem.

Unit V: Insects damage to the forest - wood borers - Gall makers - defoliating insects – termites - Seed and cone pests. Monitoring and Forecasting insect pests. Insect Management- Chemical, Physical & Biological.

Books for reference:
Semester – VI Core Paper - IX
ETHOLOGY

Objectives: To enable the students to understand the basic behaviour of animals


Unit III: Social behaviour: Social behaviour of Bees, Primates, Elephant and Lion
Foraging behaviour: Optimal foraging theory with special reference to elephants – Group foraging special reference to birds.

Unit IV: Play behaviour: Types of Play – Play in mammals – biological effects of play.
Reproductive behaviour: Sexual selection, mating pattern, parental care in birds and mammals. Courtship and display in birds.

Unit V: Animal communication: Purpose and importance of communication – Types of communications - Visual, auditory, chemical and vocalization in birds & mammals.

Text Book

References:
Semester – V : Elective - I
Eco-development and Ecotourism - II

Objectives: To make the students equipped with principles and applications of Ecotourism Programmes.

Unit I: Definition and Principles of ecotourism – Criteria for identification of ecotourism programmes – Site selection - Involvement of local communities – Training and conduct of ecotourism programmes – Baseline studies and identifying site specific programmes

Unit II: Creation of information and Interpretation centers - Marketing strategies – preparation of information guides (pamphlets, broachers, posters, website, hoardings) – preparation of schemes - appointment of Nature Education Officer

Unit III: Identification of Ecotourism programmes (Trekking, camping, rafting, jungle ride) – involvement of local communities – training for the guides – do’s and don’ts - Identification of marketing agencies – Benefit sharing mechanism

Unit IV: Successful ecotourism sites in south India - Case studies Periyar Tiger Reserve, Mudumalai Tiger Reserve, Avalanchi and Baralikadu ecotourisms

Unit V: Monitoring and evaluation of ecotourism programmes, data collection, analysis and interpretation, report writing and preparation of Ecotourism Management Plan

References
Ecotourism- A guide for planners and Managers- Lidberg, Kreg etc, Natraj Publishers, New Delhi, 1999
Tourism and Development in India- Sunitha Chopra, Ashish Publishing House, New Delhi, 1991
Eco Development- Towards a philosophy of environmental Education -Balasubramanian and Arun, Regional Institute of Higher Education, Singapore, 1984
Joint Forest Management- The Haryana Experience- Sarin Madhu, Centre for Environmental Education, Ahmedabad, 1996
Microplanning Manual for Joint Forest Management areas- Bahshih Singh, Varalekshmi, Tata Energy Research Institute, New Delhi, 1998
People and Protected Areas- Towards participatory conservation in India- Ashish Kothari, Neena Singh, Saloni Suri, Sage Publications, New Delhi, 1996
Participatory Rural Appraisal- Methods and Applications in Rural Planning- Amitava Mukherjee, Vikas Publishing House, New Delhi, 1995
Learning to share- Experiences and Reflexions on PRA and community participation- Neela Mukherjee & others, Concept Publishing Company, New Delhi, 1997
Participatory Rural Appraisal- Methodology and Application- Neela Mukherjee, Concept Publishing Company, New Delhi, 1993
Semester – VI : Elective - II : Paper II

Aquatic Biology-II (Marine Biology)

Objectives: To make the students equipped with principles and applications of Marine Ecosystem.


Unit V: Animals of interest in marine habitats viz., coelenterates, Crustaceans, Molluscs, Echinoderms, Reptiles and Mammals.

References:
1. Invitation to Oceanography by Paul R. Pinet 2013, Jones &Bartlett Learning publication house
PRACTICALS
Core Practical III
(Based on Core Papers V, VI and VII)

Wildlife Management Techniques
1. Vegetation analysis – Quadrat method
2. Population estimation of herbivores – Block count method
3. Population estimation of carnivores - Pugmark tracing
4. Camera trapping of tiger

Biology of vertebrates
5. Classification and identification of fishes, amphibians, reptiles – any five using photographs
6. Classification and identification of birds and mammals – any five using photographs

Conservation Biology
7. Prepare housing facilities for captive breeding of Lion-tailed macaque and vulture
8. Mark and locate biodiversity hotspots in India by using the map
9. Mark and locate biosphere reserves of India by using the map

Spotters
1. Identification of indirect evidences – scat, pellet, dung, droppings
2. Identification of pugmark of tiger, leopard and wild dog
4. Call Identification of common birds – any five birds
5. Identification of venomous and non-venomous south Indian snakes

A study tour to various places of ecological importance is essential. A tour report should be submitted along with the record.
PRACTICALS
Core Practical IV
(Based on Core Papers VIII and IX)

Forestry and Silviculture
1. Estimation of height of the standing tree using clinometer
2. Estimation of volume of log
3. Estimation of canopy cover
4. Identification of insect damages

Ethology
5. Prepare an ethogram of animal behavior
6. Identify and comment on courtship display of Flying lizard, peacock
7. Sexual behavior of bonnet monkey and elephant

Spotters
1. Clinometer
2. Caliper
3. Measuring tape
4. Seeds of any common five tree species
5. Insect damages – defoliator, wood borer
6. Identification of beneficial and destructive insects – Honey bee, butterfly, Termite, Rhinoceros beetle

PRACTICALS - Elective
Aquatic Biology (Based on Elective II – Papers I & II)

- pH, conductivity,
- Estimation of
  Dissolved oxygen,
  Alkalinity
  And nutrients.
- Estimation of GPP and NPP
- Study of ecological characteristics of a stream, pond, lake, reservoir and marsh (Field report).
- Freshwater and marine planktons (Spotters).
- Rocky, Sandy and Muddy shore fauna (Spotters)
- Endangered marine organisms (Photographs- Spotters)
PRACTICALS
Skill based subject Paper IV

Field Biology – GIS and Remote sensing
(Based on Papers III, IV and V semesters)

1. Population estimation of herbivores - Block count method
2. Identify and comment on the following habitat types – Evergreen forest, semi-evergreen forest, moist deciduous forest, dry deciduous forest, scrub jungle and grass lands
3. Prepare a map of the campus
4. Prepare a route map from Ooty to Mudumalai Tiger Reserve
5. Identify the type of the given map – Drainage map, Vegetation map, contour map

Spotters
Identify and comment on the use of the following field equipments in wildlife studies

1. Compass
2. Rangefinder
3. Binocular
4. Altimeter
5. Pedometer
6. GPS
7. Mark the location of the Wildlife Sanctuaries and National Parks – Gir Lion Sanctuary, Bandipur Tiger Reserve, Vedanthangal Bird Sanctuary, Kanha Tiger Reserve, Sundarban Tiger Reserve, Gulf of Mannar