B.Sc 3 Year (Semester 5) Zoology Paper 1

Diversity of Non-Chordates and Economic Zoology (Theory)

Programme/Class: Degree	Year: 3	Semester: 5
Subject: Zoology		
Course Code: **B050501T**	Course Title: **Diversity of Non-Chordates and Economic Zoology (Theory)**	

Course outcomes:
The student at the completion of the course will be able to:

- demonstrate comprehensive identification abilities of non-chordate diversity
- explain structural and functional diversity of non-chordate
- explain evolutionary relationship amongst non-chordate groups
- Get employment in different applied sectors
- Students can start their own business i.e. self employments.
- Enable students to take up research in Biological Science

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks: 33
Total No. of lectures= 60	

Unit	Topics	No. of Lectures
I	**Protozoa to Coelenterate** • Protozoa – Paramecium (Morphology and Reproduction) • Porifera – Sycon (Canal System) • Coelenterata – Obelia (Morphology and Reproduction)	7
II	**Ctenophora to Nemathelminthes** • Ctenophora - Salient features • Platyhelminthes - Taenia (Tape worm) (Morphology and Reproduction) • Nemathelminthes –Ascaris lumbricoides (Morphology and Reproduction)	7
III	**Annelida** • Annelida –Hirudinaria (Leech) (Morphology and Reproduction)	8
IV	**Arthropoda** • Arthropoda – Palaemon (Prawn) (Morphology, Appendages, Nervous System and Reproduction)	8

V	**Mollusca to Hemichordata** • Mollusca – *Pila* (Morphology, Shell, Respiration, Nervous System and Reproduction) • Echinodermata –Pentaceros (Morphology and Water Vascular System)	**8**
VI	**Vectors and pests** Life cycle and their control of following pests: Gundhi bug, Sugarcane leafhopper, Rodents. Termites and Mosquitoes and their control	**8**
VII	**Economic Zoology-1** Animal breeding and culture: Pisciculture	**7**
VIII	**Economic Zoology- 2** Sericulture, Apiculture, Lac-culture, Vermiculture	**7**

Suggested Readings:

- Barnes et al (2009). The Invertebrates: A synthesis. Wiley Backwell 17
- Hunter: Life of Invertebrates (1979, Collier Macmillan)
- Marshall: Parker &Haswell Text Book of Zoology, Vol. I (7th ed 1972, Macmillan)
- Moore: An Introduction to the Invertebrates (2001, Cambridge University Press)
- Brusca and Brusca (2016) Invertebrates. Sinauer
- Jan Pechenik (2014) Biology of the invertebrates. McGraw Hill
- Neilsen (2012). Animal Evolution: Interrelationships amongst living Phyla. Oxford
- Parasitology- Chatterjee
- Parasitology- Chakraborty
- Thomos C. Chung. General Parasitology. Hardcourt Brace and Co. Ltd. Asia, New Delhi.
- Gerard D. Schmidt and Larry S Roberts. Foundations of Parasitology. McGraw Hill.
- Bisht. D.S., Apiculture, ICAR Publication.
- Singh S., Beekeeping in India, Indian council of Agricultural Research, New Delhi.
- Jhingran. V.G. Fish and fisheries in India.
- Khanna. S.S, An introduction to fishes
- Boyd. C.E. &Tucker.C.S, Pond aquaculture water quality management.
- Biswas.K.P, Fish and prawn diseases.
- Pedigo, L.P. (2002). Entomology and Pest Management, Prentice Hall.
- Lee, Earthworm Ecology
- Stevenson, Biology of Earthworms
- Destructive and Useful Insects by C. L. Metcalf
- Sericulture for Rural Development : Hanumappa (1978), Himalaya Publication.
- Sriculture in India Sarkar, D.C. (1988), CSB, Bangalore.

This course can be opted as an elective by the students of following subjects: Open for all
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Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Test with multiple choice questions/ short and long answer questions
- Subjective long questions
- Attendance.

At the End of the whole syllabus any remarks/ suggestions:
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B.Sc. 3 Year (Semester 5) Zoology
Paper 2 Diversity of Chordates and Comparative Anatomy

Programme/Class: Degree	Year: 3	Semester: 5
Subject: Zoology		
Course Code: **B050502T**	Course Title: **Diversity of Chordates and Comparative Anatomy**	

Course outcomes:

The student at the completion of the course will be able to:
- Demonstrate comprehensive identification abilities of chordate diversity
- Explain structural and functional diversity of chordates
- Explain evolutionary relationship amongst chordates
- Take up research in biological sciences.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks: 33
Total No. of Lecture= 60	

Unit	Topics	No. of Lectures
I	Origin of Chordates & Hemichordata • Origin of Chordates. Classification of Phylum Chordata upto the class. • Hemichordata: General characteristics, classification and detailed study of *Balanoglossus* (Habit and Habitat, Morphology, Anatomy, Physiology and Development).	06
II	Cephalochordata and Urochordata • Cephalochordata : General characteristics, classification and detailed study of Branchiostoma (Amphioxus) (Habit and Habitat, Morphology, Anatomy, Physiology). • (ii)Urochordata : General characteristics, classification and detailed study of Herdmania(Habit and Habitat, Morphology, Anatomy, Physiology and Post Embryonic Development).	06
III	Classification and General Characteristics of Vertebrates • General characters and Classification of different classes of vertebrates (Pisces, Amphibia, Reptilia, Aves,	08

	Mammalia) up to the order with examples. • Poisonous and Non Poisonous Snakes and biting mechanism. • Neoteny and Paedogenesis • Migration in birds • Dentition in Mammals	
IV	Comparative Anatomy and Physiology of Vertebrates Integumentary System Structure, functions and derivatives of integument Skeletal System Overview of axial and appendicular skeleton, Jaw suspensorium, Visceral arches	08
V	Digestive System Alimentary canal and associated glands, dentition	08
VI	Respiratory System Skin, gills, lungs and air sacs; Accessory respiratory organs	08
VII	Circulatory System General plan of circulation, evolution of heart and aortic arches Urinogenital System Succession of kidney, Evolution of urinogenital ducts, Types of mammalian uteri	08
VIII	Nervous System Comparative account of brain Autonomic nervous system, Spinal cord, Cranial nerves in mammals Sense Organs Classification of receptors Brief account of visual and auditory receptors in man	08

Suggested Readings:

- Harvey et al: The Vertebrate Life (2006)
- Colbert et al: Colbert's Evolution of the Vertebrates: A history of the backboned animals through time (5th ed 2002,Wiley - Liss)
- Hildebrand: Analysis of Vertebrate Structure (4th ed 1995, John Wiley)
- Kenneth V. Kardong (2015) Vertebrates: Comparative Anatomy, Function, Evolution McGraw Hill
- McFarland et al: Vertebrate Life(1979, Macmillan Publishing)
- Parker and Haswell: TextBook of Zoology, Vol. II (1978, ELBS)
- Romer and Parsons: The Vertebrate Body (6th ed 1986, CBS Publishing Japan)
- Young: The Life of vertebrates (3rd ed 2006, ELBS/Oxford)
- Weichert C.K and William Presch (1970). Elements of Chordate Anatomy, Tata McGraw Hills

This course can be opted as an elective by the students of following subjects: Open for all
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Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Test with multiple choice questions/ short and long answer questions
- Attendance

Further Suggestions:
At the End of the whole syllabus any remarks/ suggestions: ....

B.Sc. 3 Year (Semester 5) Zoology Paper 3

Lab on Virtual Dissection, Anatomy, Economic Zoology and Parasitology (Practical)

Programme/Class: Degree	Year: 3	Semester: 5
Subject: Zoology		
Course Code: **B050503P**	Course Title: **Lab on Virtual Dissection, Anatomy, Economic Zoology and Parasitology**	
Course outcomes: The student at the completion of the course will be able to: • demonstrate comprehensive identification abilities of chordate and non- chordates diversity • explain structural and functional diversity of chordates and non- chordates • explain evolutionary relationship amongst chordates and non- chordates • Generate self employment • Enable students to take up research in biological sciences.		
Credits: 2	Core Compulsory	
Max. Marks: 25+70	Min. Passing Marks: 40	
Total No. of Lab.Periods 30(60 hours)		

Units	Topic	No of Lab.Periods
I	Study of animal specimens of various animal phyla. • To prepare permanent stained slide of septal nephridia of earthworm. • To take out the nerve ring of earthworm. • To take out hastate plate from *Palaemon*.	07
II	• Study of animal specimens of various animal phyla • Study on use and ethical handling of model organisms (Mice, rats, rabbit and pig). • To prepare stained/unstained slide of placoid scales. • Comparative study of bones of different vertebrates. • Comparative study of histological slides of different tissues of vertebrates.	07
III	• Permanent Preparation of: Euglena, Paramecium • Study of prepared slides/specimens of Entamoeba, Giardia, Leishmania, Trypanosoma, Plasmodium, Fasciola, Cotugnia, Taenia, Rallietina, Polystoma Schistosoma, Echinococcus, Enterobius, Ascaris and Ancylostoma • Permanent Preparation of Cimex (bed bug)/ Pediculus (Louse), Haematopinus (cattle louse), fresh water annelids, arthropods; and soil arthropods. • Larval stages of helminths and arthropods.	08

	• Permanent mount of wings, mouth parts and developmental stages of mosquito and house fly. • Permanent preparation of ticks/ mites, abdominal gills of aquatic insects viz. Chironomus larva, dragonfly and mayfly nymphs, preparation of antenna of housefly. • Identification of pests. • Life history of silkworm, honeybee and lac insect. • Different types of important edible fishes of India. • Slides of plant nematodes. • Study of an aquatic ecosystem, its biotic components and food chain. • Project Report/ model chart making. • Dissections : through multimedia / models • Cockroach : Central nervous system • Wallago: Afferent and efferent branchial vessels, Cranial nerves, Weberian ossicles.	
IV	Virtual Labs (Suggestive sites) https://www.vlab.co.in https://zoologysan.blogspot.com www.vlab.iitb.ac.in/vlab https://www.vlab.co.in https://zoologysan.blogspot.com www.vlab.iitb.ac.in/vlab www.onlinelabs.in www.powershow.com https://vlab.amrita.edu https://sites.dartmouth.edu	08

Suggested Readings:

- Harvey et al: The Vertebrate Life (2006)
- Colbert et al: Colbert's Evolution of the Vertebrates: A history of the backboned animals through time (5th ed 2002,Wiley - Liss)
- Hildebrand: Analysis of Vertebrate Structure (4th ed 1995, John Wiley)
- Kenneth V. Kardong (2015) Vertebrates: Comparative Anatomy, Function, Evolution McGraw Hill
- McFarland et al: Vertebrate Life (1979, Macmillan Publishing)
- Parker and Haswell: TextBook of Zoology, Vol. II (1978, ELBS)
- Romer and Parsons: The Vertebrate Body (6th ed 1986, CBS Publishing Japan)
- Young: The Life of vertebrates (3rd ed 2006, ELBS/Oxford)
- Barnes et al (2009). The Invertebrates: A synthesis. Wiley Backwell 17
- Marshall: Parker &Haswell Text Book of Zoology, Vol. I (7th ed 1972, Macmillan)
- Moore: An Introduction to the Invertebrates (2001, Cambridge University Press)
- Brusca and Brusca (2016) Invertebrates. Sinauer
- Jan Pechenik (2014) Biology of the invertebrates. McGraw Hill
- Boradale, L.A. and Potts, E.A. (1961). Invertebrates: A Manual for the use of Students. Asia Publishing Home
- Robert Leo Smith Ecology and field biology Harper and Row publisher
- Handbook of Practical Sericulture :Ullal, S.R. and Narasimhanna, M.N. (1987),Central Silk Board Publication, Bangalore.
- Prost, P. J. (1962). Apiculture. Oxford and IBH, New Delhi.
- Bisht. D.S., Apiculture, ICAR Publication.

- Singh S., Beekeeping in India, Indian council of Agricultural Research, New Delhi.
- Ullal S.R. and Narasimhanna, M.N. Handbook of Practical Sericulture: CSB,Bangalore
- Jolly. M. S. Appropriate Sericultural Techniques; Ed., Director, CSR & TI, Mysore.
- Handbook of Silkworm Rearing: Agriculture and Technical Manual-1, Fuzi Pub. Co.
- Santanam, B. et al, A manual of freshwater aquaculture
- Boyd. C.E. &Tucker.C.S, Pond aquaculture water quality management
- Pedigo, L.P. (2002). Entomology and Pest Management, Prentice Hall.
- Ranganathan L.S, Vermicomposting technology- soil health to human health

Suggested Continuous Evaluation Methods

- Assessment of Audio-visual Aids and their use.
- Assessment of techniques and communication skills.
- Assessment of Educational Plan and Visits Record.
- Seminar/ Presentation on any topic of the above syllabus
- Test with multiple choice questions/ short and long answer questions
- Attendance

Course prerequisites: To study this course, a student must have had the subject ALL inclass12th.
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At the End of the whole syllabus any remarks/ suggestions:
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B.Sc. 3 Year (Semester 6) Zoology Paper 1

Evolutionary and Developmental Biology

Programme/Class: Degree	Year: 3	Semester: 6
Subject: Zoology		
Course Code: **B050601T**	Course Title: **Evolutionary and Developmental Biology**	

Course outcomes:
The student at the completion of the course will be able to:

- Understand that by biological evolution we mean that many of the organisms that inhabit the earth today are different from those that inhabited it in the past.
- Understand that natural selection is one of several processes that can bring about evolution, although it can also promote stability rather than change.
- Understand how the single cell formed at fertilisation forms an embryo and then a full adult organism.
- Integrate genetics, molecular biology, biochemistry, cell biology, anatomy and physiology during embryonic development.
- Understand a variety of interacting processes, which generate an organism's heterogeneous shapes, size, and structural features.
- Understand how a cell behaves in response to an autonomous determinant or an external signal, and the scientific reasoning exhibited in experimental life science.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks: 33
Total No. of Lectures-60	

Units	Topic	No of Lectures
I	**Theories of Evolution** • Origin of Life • Historical review of evolutionary concept: Lamarckism, Darwinism (Natural, Sexual and Artifical selection) • Modern synthetic theory of evolution • Patterns of evolution (Divergence, Convergence, Parallel, Coevolution)	08
II	**Population Genetics** • Microevolution and Macroevolution: allele frequencies, genotype frequencies, Hardy- Weinberg equilibrium and conditions for its maintenance • Forces of evolution: mutation, selection, genetic drift	08
III	**Direct Evidences of Evolution** Types of fossils, Incompleteness of fossil record, Dating of fossils, Phylogeny of horse	07
IV	**Species Concept and Extinction** • Biological species concept (Advantages and Limitations); Modes of speciation (Allopatric, Sympatric) • Mass extinction (Causes, Names of five major extinctions	07

V	**Gamete Fertilization and Early Development** • Gametogenesis, Fertilization • Cleavage pattern • Gastrulation, fate maps • Developmental mechanics of cell specification • Morphogenesis and cell adhesion	06
VI	**Developmental Genes** • Genes and development • Molecular basis of development • Differential gene expression	08
VII	**Early Vertebrate Development** • Early development of vertebrates (fish, birds & mammals) • Metamorphosis, regeneration and stem cells • Environmental regulation of development	08
VIII	**Late Developmental Processes** • The dynamics of organ development • Development of eye, kidney, limb • Metamorphosis: the hormonal reactivation of development in amphibians, insects • Regeneration: salamander limbs, mammalian liver, Hydras • Aging: the biology of senescence	08

Suggested Readings:

- Ridley, M. (2004). *Evolution*. III Edition. Blackwell Publishing
- Barton, N. H., Briggs, D. E. G., Eisen, J. A., Goldstein, D. B. and Patel, N. H. (2007). *Evolution*. Cold Spring, Harbour Laboratory Press.
- Hall, B. K. and Hallgrimsson, B. (2008). *Evolution*. IV Edition. Jones and Bartlett Publishers
- Campbell, N. A. and Reece J. B. (2011). *Biology*. IX Edition, Pearson, Benjamin, Cummings.
- Douglas, J. Futuyma (1997). *Evolutionary Biology*. Sinauer Associates.
- Developmental Biology: T. Subramaniam, (Reprint), Narosa Publishing House Pvt. Ltd., New Delhi (2013).
- Essential Developmental Biology: Jonathan M. W. Slack, (3rd ed.), Wiley-Blackwell. (2012).
- Developmental biology: Werner A. Müller, Springer Science & Business Media. (2012).
- Human Embryology and Developmental Biology E-Book: Bruce M. Carlson, Elsevier Health Sciences. (2018).
- Developmental Biology: Michael J. F. Barresi, Scott F. Gilbert, Oxford University Press. (2019).

This course can be opted as an elective by the students of following subjects: Open for all
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Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Test with multiple choice questions/ short and long answer questions
- Attendance

At the End of the whole syllabus any remarks/ suggestions

B.Sc. 3 Year (Semester 6) Zoology Paper 2
Ecology, Ethology, Environmental Science and Wildlife

Programme/Class: Degree	Year: 3	Semester: 6
Subject: Zoology		
Course Code: **B050602T**	Course Title: **Ecology, Ethology, Environmental Science and Wildlife**	

Course outcomes:
The student at the completion of the course will learn:
- Complexities and interconnectedness of various environmental levels and their functioning.
- Global environmental issues, their causes, consequences and amelioration.
- To understand and identify behaviours in a variety of taxa.
- The proximate and ultimate causes of various behaviours.
- About the molecules, cells, and systems of biological timing systems.
- Conceptualizing how species profitably inhabit in the temporal environment and space out their activities at different times of the day and seasons.
- To interpret the cause and effect of lifestyle disorders contributing to public understanding of biological timing.
- To understand the importance of wildlife conservation.

Credits: 4	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:33
Total No. of Lectures-Tutorials- 60	

Unit	Topic	No of Lectures
I	**Introduction to Ecology** • History of ecology, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of physical factors	04
II	**Organization of Ecosystem** • Levels of organization, Laws of limiting factors, Study of physical factors, • Population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion, Exponential and logistic growth, • Types of ecosystems with one example in detail, Food chain: Detritus and grazing food chains, Food web, Energy flow through the ecosystem, • Ecological pyramids and Ecological efficiencies, Nutrient and biogeochemical cycle with one example of Carbon cycle	12
III	**Community Ecology** Community characteristics: species richness, dominance, diversity, abundance, Ecological succession with one example	07
IV	**Environmental Hazards** • Sources of Environmental hazards • Climate changes	07

	• Greenhouse gases and global warming • Acid rain, Ozone layer destruction	
V	**Effects of Climate Change** • Effect of climate change on public health • Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal, • Nuclear waste handling and disposal, Waste from thermal power plants, • Case histories on Bhopal gas tragedy, Chernobyl disaster, Seveso disaster and Three Mile Island accident and their aftermath	06
VI	**Behavioural Ecology and Chronobiology** • Origin and history of Ethology, • Instinct vs. Learnt Behaviour • Associative learning, classical and operant conditioning, Habituation, Imprinting, • Circadian rhythms; Tidal rhythms and Lunar rhythms • Chronomedicine	08
VII	**Introduction to Wild Life** • Values of wild life - positive and negative; Conservation ethics; Importance of conservation; Causes of depletion; World conservation strategies.	08
VIII	**Protected areas** • National parks & sanctuaries, Community reserve; Important features of protected areas in India; Tiger conservation - Tiger reserves in India; Management challenges in Tiger reserve	08

Suggested Readings:

- Ecology: Theories & Applications. Peter D. Stiling, 2001, Prentice Hall.
- Ecological Modeling. 2008. Grant, W.E. and Swannack, T.M., Blackwell.
- Ecology: The Experimental Analysis of Distribution and Abundance. Charles J. Krebs, 2016, Pearson
- Education Inc.
- Elements of Ecology. T.M. Smith and R.L. Smith, 2014, Pearson Education Inc.
- Environmental Chemistry. 2010. Stanley and Manahan, E. CRC, Taylor & Francis. London.
- Environment. Raven, Berg, Johnson, 1993, Saunders College Publishing.
- Essentials of Ecology. G.T. Miller, Jr. & Scott. E. Spoolman, 2014, Brooks/Cole, Cengage Learning.
- Freshwater Ecology: A Scientific Introduction. 2004. Closs, G., Downes, B. and Boulton, A. Wiley-
- Blackwell publisher, Oxford.
- Fundamental Processes in Ecology: An Earth system Approach. 2007. Wilkinson, D.M. Oxford University Press, UK.
- Fundamentals of Ecology. E.P. Odum& Gray. W. Barrett, 1971, Saunders
- Caughley, G., and Sinclair, A.R.E. (1994). Wildlife Ecology and Management. Blackwell Science.
- Woodroffe R., Thirgood, S. and Rabinowitz, A. (2005). People and Wildlife, Conflict or Co-existence? Cambridge University.
- Bookhout, T.A. (1996). Research and Management Techniques for Wildlife and Habitats, 5 th edition. The Wildlife Society, Allen Press.
- Sutherland, W.J. (2000). The Conservation Handbook: Research, Management and Policy. Blackwell Sciences
- Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008). Problem-Solving in Conservation Biology and

Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing.
This course can be opted as an elective by the students of following subjects: Open for all The eligibility for this paper is 10+2 with any subject
Suggested Continuous Evaluation Methods: • Seminar/ Presentation on any topic of the above syllabus • Test with multiple choice questions/ short and long answer questions • Attendance
Course prerequisites: To study this course, a student must have had the subject ALL in class12th. • The eligibility for this paper is 10+2 with any subject
Further Suggestions: It widens the scope for students to join Government and Non-Government organization upskilling the people at different levels as per their socio-economic structure.
At the End of the whole syllabus any remarks/ suggestions: ………

B.Sc. 3 Year (Semester 6) Zoology Paper 3
Lab on Ecology, Environmental Science, Behavioral Ecology & wildlife

Programme/Class: Degree	Year: 3	Semester: 6
Subject: Zoology		
Course Code: **B050603P**	Course Title: **Lab on Ecology, Environmental Science, Behavioral Ecology & wildlife**	

Course outcomes:

- The student at the completion of the course will be able to:
- To understand the basic concepts, importance, status and interaction between organisms and environment.
- Get employment in forest services, sanctuaries, conservatories etc.
- Enable students to take up research in wildlife.

Credits: 2	Core Compulsory
Max. Marks: 25+75	Min. Passing Marks:40
Total No. of Lab Periods- 30(60 hours)	

Unit	Topic	No of Lectures
I	• Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided. • Study of population dynamics through numerical problems. • Study of circadian functions in humans (daily eating, sleep and temperature patterns).	26
II	Report on a visit to National Park/Biodiversity Park/Wild life sanctuary	04
III	• Demonstration of basic equipments needed in wildlife studies use, care and maintenance (Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of Cameras and lenses) • Familiarization and study of animal evidences in the field; Identification of animals through pug marks, hoof marks, scats, pellet groups, nest, antlers etc. • Demonstration of different field techniques for flora and fauna	15
IV	Virtual Labs (Suggestive sites) https://www.vlab.co.in https://zoologysan.blogspot.com www.vlab.iitb.ac.in/vlab	15

Suggested Readings:

- Ecology: The Experimental Analysis of Distribution and Abundance. Charles J. Krebs, 2016, Pearson Education Inc.
- Fundamentals of Ecology. E.P. Odum& Gray. W. Barrett, 1971, Saunders.
- Robert Leo Smith Ecology and field biology Harper and Row publisher
- Bookhout, T.A. (1996). Research and Management Techniques for Wildlife and Habitats, 5th edition. The Wildlife Society, Allen Press.
- Methods and Practice in biodiversity Conservation by David Hawks worth, Springer publication.

This course can be opted as an elective by the students of following subjects: Open for all
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Suggested Continuous Evaluation Methods:

- Seminar/ Presentation on any topic of the above syllabus
- Test with multiple choice questions/ short and long answer questions
- Attendance

Course prerequisites: To study this course, a student must have had the subject.............in class/12th/ certificate/diploma.
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At the End of the whole syllabus any remarks/ suggestions:
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