

SEMESTER - I

Course Code	Course Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	Allied Zoology I	Core	Y	-	-	-	4	4	25	75	100
Learning Objectives											
CO1	To acquire a basic knowledge of diversity and organization of Protozoa, Coelenterata, Helminthes and Annelida										
CO2	To acquire a basic knowledge of diversity and organization of Arthropoda, Mollusca and Echinodermata										
CO3	To comprehend the taxonomic position and diversity among Protochordata, Pisces and Amphibia										
CO4	To comprehend the taxonomic position and diversity among Reptilia, Aves and Mammalia										
CO5	To acquire detailed knowledge of select invertebrate and chordate forms										
UNIT	Details							No. of Hours	Course Objectives		
I	Diversity of Invertebrates–I Principles of taxonomy. Criteria for classification– Symmetry and Coelom– Binomial nomenclature. Classification of Protozoa (Entamoeba, plasmodium), Coelenterata (Obelia), Helminthes (Ascaris, Taenia) and Annelida (Neries, Leech) upto classes with examples.							12	CO1		
II	Diversity of Invertebrates–II Classification of Arthropoda, (Cockroach, Prawn) Mollusca (Fresh water mussel, Pila) and Echinodermata (Asterias and) upto class level with examples.							12	CO2		
III	Diversity of Chordates–I							12	CO3		

	Classification of Prochordata, (Ascidia, Amphioxus) Pisces (Scoliodon) and Amphibia (Rana tigrina) upto orders giving examples.		
IV	Diversity of Chordates – II Classification of Reptilia (Calotes), Aves (Pigeon) and Mammalia (Rabbit) upto orders giving examples.	12	CO4
V	Animal organisation Structure and organization of (i). Earthworm (ii) Rat (iii) Fish	12	CO5
Total		60	
Course Outcomes			
Course Outcomes	On completion of this course, students will;		
CO1	Recall the characteristic features invertebrates and chordates.	PO1	
CO2	Classify invertebrates up to class level and chordates up to order level	PO1, PO2	
CO3	Explain and discuss the structural and functional organisation of some invertebrates and chordates	PO4, PO6	
CO4	Relate the adaptations and habits of animals to their habitat	PO4, PO5, PO6	
CO5	Analyse the taxonomic position of animals.	PO3, PO8	
Text Books (Latest Editions)			
1.	Ekambaranatha Iyer, -Outlines of Zoology Viswanathan Publication		
References Books (Latest editions, and the style as given below must be strictly adhered to)			
1.	Ekambaranatha Iyer and T.N. Ananthakrishnian - A Manual		
2.	Ekambaranatha Iyer and T.N. Ananthakrishnan, - A Manual of Zoology - Invertebrata – Vol III: Viswanathan Publishers.		

3.	EkambaranathaIyarandT.N.Ananthakrishnan,- AManualofZoology:ChordataViswanathanPublishers.	
4.	JordanE.L.andP.S. Verma-Invertebrate Zoology,S.Chand&Co.	
Web Resources		
1.	www.sanctuaryasia.com	
2.	www.iaszoology.com	
Methods of Evaluation		
Internal Evaluation	Continuous Internal Assessment Test	25 Marks
	Assignments	
	Seminars	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75 Marks
	Total	100 Marks
Methods of Assessment		
Recall (K1)	Simple definitions, MCQ, Recall steps, Concept definitions	
Understand/ Comprehend (K2)	MCQ, True/False, Short essays, Concept explanations, Short summary or overview	
Application (K3)	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain	
Analyze (K4)	Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge	
Evaluate (K5)	Longer essay/ Evaluation essay, Critique or justify with pros and cons	
Create (K6)	Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations	

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	S							
CO 2	M	S						
CO 3				S		S		
CO 4				S	S	M		
CO 5			S					S

S-Strong(3)

M-Medium (2)

L-Low (1)

SEMESTER - II

Course Code	Course Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	Allied Zoology II	Core	Y	-	-	-	4	4	25	75	100
Learning Objectives											
CO1	To enable students to learn basic concepts relating to aspects of respiratory, circulatory, excretory nervous and sensory physiology.										
CO2	To enable students to comprehend the processes involved during development										
CO3	To enable students to learn basic concepts of immunity and the working of immune organs and familiarize them with the recommended vaccination schedule										
CO4	To enable students to comprehend the basic concepts of human genetics and patterns of inheritance										
CO5	To enable students to learn about aspects of animal behaviour such as foraging, courtship, nest construction, parental care and learning										
UNIT	Details							No. of Hours	Course Objectives		
I	Respiration- Respiratory pigments and transport of gases. Mechanism of blood clotting. Types of excretory products – Ornithine cycle. Structure of neuron – Conduction of nerve impulse, Mechanism of vision and hearing.							12	CO1		
II	Fertilization, Cleavage, Gastrulation and Organogenesis of Frog; Placentation in mammals							12	CO2		
III	Innate and Acquired - Active and Passive; Antigens and Antibodies; Immunological organs – responses in humans; Vaccination schedule							12	CO3		
IV	Human Genetics: Human Chromosomes – Sex Determination in Humans; Patterns of Inheritance:							12	CO4		

	Autosomal Dominant, Autosomal Recessive, X-linked , Y-linked inheritance, Multiple Alleles; Genetic Counselling		
V	Animal Behaviour: Foraging, Courtship Behaviour, Shelter and Nest Construction, Parental Care, Learning Behaviour	12	CO5
Total		60	
Course Outcomes			
Course Outcomes	On completion of this course, students will;		
CO1	Recall the parts and working of body organs and developmental stages, name the patterns of inheritance and list different types of animal behaviour	PO1	
CO2	Analyse the different developmental stages	PO1, PO2	
CO3	Analyse the working of body and immune systems	PO4, PO6	
CO4	Analyse the different patterns of inheritance	PO4, PO5, PO6	
CO5	Relate the behaviour of animals to physiology. Analyse the different types of behaviour	PO3, PO8	
Text Books (Latest Editions)			
1.	Verma P.S. & Agarwal - Developmental Biology, Chordata embryology S. Chand & Co.		
References Books (Latest editions, and the style as given below must be strictly adhered to)			
1.	Owen, J. A., Punt, J. & Stranford, S. A. - Kuby Immunology. New York: W.H. Freeman & Company		
2.	Klug, W. S., Cummings, M. R. & Spencer, C - Concepts of Genetics. (12th ed.). New Jersey: Pearson Education		
3.	Mathur, R.- Animal Behaviour. Meerut: Rastogi.		
4.	Verma P.S. & Agarwal - Developmental Biology, Chordata embryology S. Chand & Co.		
Web Resources			
1.	Continuous Internal Assessment Test		
2.	Assignments		
3.	Seminars		
4.	Attendance and Class Participation		
5.	End Semester Examination		
Methods of Evaluation			
Internal	Continuous Internal Assessment Test		25

Evaluation	Simple definitions, MCQ, Recall steps, Concept definitions	Marks
	MCQ, True/False, Short essays, Concept explanations, Short summary or overview	
	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain	
External Evaluation	Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge	75 Marks
	Longer essay/ Evaluation essay, Critique or justify with pros and cons	100 Marks

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	S							
CO 2	M	S						
CO 3				S		S		
CO 4				S	S	M		
CO 5			S					S
	S-Strong(3)			M-Medium (2)		L-Low (1)		

ALLIED ZOOLOGY PRACTICAL

Semester II

COURSE OBJECTIVES:

- To make them familiarize with basic laboratory techniques in related to Zoology
- To make them understand the taxonomic position, body organization and evolutionary relationship of species.
- To inculcate the significance of various invertebrates and chordates in their ecosystem.
- To highlight the information on economic aspects of Zoology.
- To comprehend the theoretical and practical applications of species diversity.

DISSECTION:

1. Earthworm - Digestive and Nervous system.
2. Cockroach- Digestive and Nervous system.
4. Prawn – Nervous system

MOUNTING:

1. Mouth parts – honeybee, cockroach and mosquito (slide).
2. Earthworm – body setae and penial setae.
3. Fish – cycloid scale, ctenoid scale and placoid scale.
4. Pila – Radula (Slide)

Spotters:

Invertebrata –

Amoeba, Paramecium, Trypanosoma, Euglena, Plasmodium, Leucosolenia, Sycon sponge, Aurelia, Obelia, planaria, Liver fluke, Tapeworm, Cockroach, Planaria, Earthworm, Nereis, Leech, Prawn/Shrimp, Scorpion, Grasshopper, Fresh water mussel, Pila, Starfish.

Protochordata and Vertebrata

Amphioxus, Shark, Catla, Frog, Salamander, Calotes, Chamaeleon, Turtle, Cobra, Viper, Pigeon, Rat, Bat, Rabbit.

Sphygmomanometer, stethoscope, rain gauge

Commercial important species:

Apiculture (Apiary devices) - Newton's beehive, honey extracting devices, honey, wax

Sericulture - Bombyx mori, cocoons, silk thread, rearing appliances.

Aquaculture - Catla, Rohu, Mrigal, fresh water prawn (*Macrobrachium rosenbergii*), marine shrimp- (*Penaeus monodon* / *Litopenaeus vannamei*).

Vermiculture- earthworm species - types.

COURSE OUTCOMES:

Upon successful completion of this course the students would be able to:

- Practically identify species (fresh and preserved) along with its larval forms.
- Analyze the relationship among animals to their habitat
- Recognize the diversity of invertebrate species from Protozoa to Echinodermata.
- Recognize the significance and economic value of sericulture and apiculture.
- Gain knowledge on significance of aquaculture and their economic role.
- Understand the significance of vermiculture technology and their ecological and economic importance.