University of Kerala

Discipline	**ZOOLOGY**				
Course Code	**UK3DSCZOO203**				
Course Title	**Concepts of Ethology**				
Type of Course	**DSC**				
Semester	III				
Academic Level	200 – 299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	4	3 hours	-	2 hours	5
Pre-requisites	Pass in Class XII				
Course Summary	This course provides a detailed examination of animal behaviour, spanning its historical origins, classification, and analysis, alongside discussions on proximate and ultimate causes. Students explore a broad spectrum of topics including social dynamics, sexual behaviours, communication, territoriality, aggression, parental care, and the intricate rhythms of chronobiology, with a focus on understanding the evolutionary forces that shape these behaviours. Field oriented activities of this course will help the student a better understanding of animal and its interaction with environment.				

Detailed Syllabus

Module	Unit	Content	45 hrs
I		**Introduction to Animal Behaviour**	**6**
	1.1	Origin and history of Ethology, Animal behaviour classification and Analysis of behaviour patterns (Brief Account).	2
	1.2	Proximate and ultimate causes of behaviour, Methods and recording of a behaviour.	2
	1.3	Brief contributions of Karl Von Frisch, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen	2
II		**Animal Behaviour Patterns**	**8**
	2.1	Patterns of Behaviour, Stereotyped Behaviours - Orientation and Reflex. Individual Behavioural patterns: Instinct and Learned Behaviour.	4
	2.2	Associative learning, classical and operant conditioning, Habituation, Imprinting (Brief).	4
III		**Social and Sexual behaviour**	**10**
	3.1	Social Behaviour: Social organization in termites and honey bees. Altruism. Conflict behaviour.	3
	3.2	Sexual Behaviour, Sexual dimorphism, Mate choice in peacock. Intra-sexual selection (male rivalry in red deer).	3

	3.3	Kinship theory: Relatedness & inclusive fitness.	2
	3.4	Parental care in fishes (Nest building & cost benefit)	2
IV	**Behaviour and Evolution of Behaviours**		**12**
	4.1	Behaviour and evolution of communication in animals: Social communication; Social dominance, Communication in honey bee	5
	4.2	Territoriality in Monkeys and Dogs, mating systems, parental investment and reproductive success.	3
	4.3	Aggressive behavior, Parental care, habitat selection and optimality in foraging	4
V	**Chronobiology**		**9**
	5.1	Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; Concept of synchronization and masking; Photic and non-photic zeitgebers; Circannual rhythms; Photoperiod regulation seasonal reproduction of vertebrates; Role of melatonin.	3
	5.2	Migration, orientation and navigation; Domestication and behavioural changes. Biological rhythms: types and characteristics	3
	5.3	Chronobiology; Brief historical developments in chronobiology; Adaptive significance of biological clocks; Relevance of biological clocks; Describe briefly: Chronopharmacology, Chronomedicine, Chronotherapy.	3

Practicum (30 hrs)

Sl.No.	Contents
1	To study nests and nesting habits of the birds and social insects.
2	To study the behavioural responses of wood lice to dry and humid conditions.
3	To study geotaxis behaviour in earthworm/ To study the phototaxis behaviour in insect larvae.
4	Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a project report.
5	Study of circadian functions in humans (daily eating, sleep and temperature patterns)

References

1. Ridley, M (2004). Evolution III Edition Blackwell publishing.
2. Hall, B.K. and Hallgrimson, B (2008). Evolution IV Edition. Jones and Barlett Publishers.
3. Douglas, J. Futuyma (1997). Evolutionary Biology. Sinauer Associates.
4. V. B Rastogi (2018) Organic Evolution- MEDTEC publication.
5. Ridley, M (2004) Evolution III Edition Blackwell publishing.
6. David McFarland (1985).Animal Behaviour, Pitman Publishing Limited, London, UK.

7. Manning, A. and Dawkins, M. S (2012). An Introduction to Animal Behaviour, Cambridge, University Press, UK.
8. Drickamar (2001). Animal Behavior: Mechanisms, Ecology, Evolution. McGraw-Hill
9. Education.
10. John Alcock (2001). Animal Behaviour, Sinauer Associate Inc., USA.
11. Paul W. Sherman and John Alcock (2010) Exploring Animal Behaviour, Sinauer Associate Inc., Massachusetts, USA.
12. Jay. C. Dunlap, Jennifer. J. Loros, Patricia J. De Coursey (ed). 2004, Chronobiology
13. Biological Timekeeping: Sinauer Associates, Inc. Publishers, Sunderland, MA, USA
14. D.S. Saunders, C.G.H. Steel, X., Afopoulou (ed.) R.D. Lewis. (3rd Ed) 2002. Insect Clocks: Barens and Noble Inc. New York, USA.
15. Vinod Kumar (2002). Biological Rhythms: Narosa Publishing House, Delhi/ Springer-
    Verlag, Germany.
    https://ccb.ucsd.edu/the-bioclock-studio/education-resources/basics/part2.html
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Course Outcomes

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Examine and critically to evaluate the emergence of ideas that have shaped how we observe and collect data on animal behaviour.	U, An	PSO-1,2
CO-2	Imagine and improve the beneficiaries attitude to monitor the animal responses using suitable activity	C,R,U	PSO-1,2
CO-3	Understand the main historical ideas that underpin animal behaviour theory	R, U	PSO-2,3
CO-4	Critically review hypotheses to explain evolution of animal behaviour	U, An	PSO-1,2
CO-5	Understand and identify different biological rhythms in animal life	A, E, C	PSO-1,5,6

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

Name of the Course: Concepts of Ethology

Credits: 3:0:1 (Lecture: Tutorial: Practical)

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
1	Examine and critically to evaluate the emergence of ideas that have shaped how we observe and collect data on animal behaviour.	PO-1/PSO-1/PSO-2	U, An	F	L	
2	Imagine and improve the beneficiaries attitude to monitor the animal responses using suitable activity	PO-1/PSO-1,2	C,R,U	F,C	L	P
3	Understand the main historical ideas that underpin animal behaviour theory	PO-5/PO-8/PSO-2/PSO-3	R, U	F, C	L	
4	Critically review hypotheses to explain animal behaviour	PO-8/PSO-1/PSO-2	An	F, C	L	
5	Understand different methods for collecting data on animal behaviour	PO-6/PO-8/PSO-1/PSO-5/PSO-6	A, C	P		P

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with PSOs and POs:

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	1	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-
CO3	-	2	3	-	-	-	-	-	-	-	-	-	3	-	-	2
CO4	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	3
CO5	2	-	-	-	2	2	-	-	-	-	-	-	-	2	-	3

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

Assignment /Seminar Topics

- Animal Behavioural Types
- Animal Migration
- Biological Clocks
- Biological Rhythms
- Chronobiology

Mapping of COs to Assessment Rubrics:

	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO 1	✓	✓		✓
CO 2	✓	✓		✓
CO 3	✓	✓		✓
CO 4	✓	✓		✓
CO5	✓	✓		✓