

ST. JOSEPH'S COLLEGE FOR WOMEN (A), VISAKHAPATNAM

Four Year – B.Sc. (Hons), Semester – VIII

ZOOLOGY

ANIMAL BEHAVIOUR AND CHRONOBIOLOGY

Code: Z 8502(3)

Time:4hrs/week

Max. Marks-100

- **Learning objectives:** Enable the students to
- Gain knowledge on the patterns of behaviour.
- Understand / recognize social behaviour & sexual behaviour.
- Discuss the significance of biological clocks.
- Summarize the importance of various biological rhythm in nature.

- **Learning outcomes:** students will be able to
- Understand the concepts of ethology.
- Acquaint with the patterns of animal behaviour.
- Observe the adaptations in various animals.
- Develop an overview of the principles of chronobiology.

- **SYLLABUS**

UNIT-1

1.1 Introduction to Animal Behaviour

1.2 Origin and history of Ethology; Brief profiles of Karl Von Frish, Ivan Pavlov, KonradLorenz, Niko Tinbergen

1.3 Proximate and ultimate causes of behaviour Methods and recording of a behaviour

UNIT 2: Patterns of Behaviour

2.1 Stereotyped Behaviours (Orientation, Reflexes)

2.2 Individual Behavioural patterns; Instinct vs. Learnt Behaviour

2.3 Associative learning, classical and operant conditioning, Habituation, Imprinting.

2.4 Animal Bonds (parent-parent, Parent-Child) etc.

UNIT 3: Social and Sexual Behaviour

3.1 Social Behaviour: Concept of Society; Communication and the senses

3.2 Altruism; Insects' society with Honey bee as example; Foraging in honey bee and advantages of the waggle dance.

3.3 Sexual Behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Sexual conflict in parental care.

UNIT 4: Introduction to Chronobiology

- 4.1 Historical developments in chronobiology; Biological oscillation: the concept of Average, amplitude, phase and period.
- 4.2 Adaptive significance of biological clocks
- 4.3 Relevance of biological clocks; Chrono pharmacology, Chrono medicine, Chronotherapy.

UNIT 5: Biological Rhythm

- 5.1 Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms
- 5.2 Concept of synchronization and masking; Photic and non-photic zeitgebers
- 5.3 Circannual rhythms; Photoperiod and regulation seasonal reproduction of vertebrates; Role of melatonin and serotonin.

- **Text Books**
- **Reference Books**
- David McFarland, Animal Behaviour, Pitman Publishing Limited, London, UK.
- Manning, A. and Dawkins, M. S, An Introduction to Animal Behaviour, Cambridge, University Press, UK.
- John Alcock, Animal Behaviour, Sinauer Associate Inc., USA.
- Paul W. Sherman and John Alcock, Exploring Animal Behaviour, Sinauer Associate Inc., Massachusetts, USA.
- Chronobiology Biological Timekeeping: Jay. C. Dunlap, Jennifer. J. Loros, Patricia J. De Coursey (ed). 2004, Sinauer Associates, Inc. Publishers, Sunderland, MA, USA
- Insect Clocks D.S. Saunders, C.G.H. Steel, X., Afopoulou (ed.) R.D. Lewis. (3rd Ed) 2002 Barenz and Noble Inc. New York, USA
- Biological Rhythms: Vinod Kumar (2002) Narosa Publishing House, Delhi/ Springer-Verlag, Germany.

- **Suggested activities**
- Observation – recording of behavior pattern of pet animals / animals in the community
- Observation of behavioural changes in Honey bees