ZOH503- NEUROBIOLOGY AND BEHAVIOUR

Teaching Hours10 /Unit

COURSE OUTCOME

1. This course is focussed on understanding the structural complexity and functioning of the nervous system across the animal kingdom.
2. Complexity of nervous systems among different animal groups and its evolutionary significance with respect to its structural and functional organizations are discussed.
3. Students are taught different mechanisms of communication between animals of same/different species.
4. Levels of learning by animals and how this information is stored in the form of memory are highlighted.
5. Animal behavioural studies are also dealt to understand how the nervous system helps animals to face different psychological conditions caused due to stress, anxiety, depression, etc.
6. In addition, neurological controls of reproductive strategies played by different animal species to increase their populations are highlighted.

UNIT I

Cellular neurophysiology-
Organization of nervous systems
Ionic basis of resting membrane potential
Generation and conduction of action potential
Neural transmission and integration
Sensory transduction

UNIT II

Motor systems –
Excitation-Contraction coupling
Molecular basis of muscle contraction
Skeletal muscle mechanics and fibre types
Smooth muscle and cardiac muscle
Neuro-Muscular disorders

UNIT III

Learning and memory-
Instincts and Imprinting
Habituation, sensitization and Associative learning
Cognitive abilities and reasoning
Types of memory and learning
Molecular mechanisms of learning and memory

UNIT IV

Communication-

Chemical Ecology –Pheromones:Chemistry, types, and significance in insects and mammals.

Vomeronasal organ

Sound production and auditory communication in insects

Dance language' in honeybees

Speech production

UNIT V

Reproductive strategies-

Features of sexual reproduction

Parental investment of the sexes

Sexual selection

Mate choice, competition and aggression

Mating systems – polygamy, monogamy, polygyny.

REFERENCES

1. Alcock, J. (1993) Animal behaviour: an evolutionary approach, 5th edition, Sinauer Publications,
2. Aoki, K., Ishii S. and Morita I. (1984) Animal behaviour, Springer Verlag.
3. Boulenger, E. G. (1993) An Introduction to animal behaviour, Discovery Publishing House
4. Burrows, M. (1996) The Neurobiology of Insect Brain, Oxford University Press.
5. Fantino, E. and Logan L. A. (1979) The experimental analysis of behavior, W. H. Freeman Co., USA.
6. Gadagkar R. (1997) Survival strategies, University Press
7. Huntingford, F. (1984) The study of animal behaviour, Chapman Hall Ltd.,
8. Hinde R A. (1982) Ethology, Fontana paperbacks, USA
9. Manning A. and Dawkins M. S. (1997) An introduction to Animal Behaviour, Cambridge University Press.
10. Simmons P. and David Y. (1999) Nerve Cell and Animal Behaviour, 2nd edition. Cambridge University Press.