5. Preparation of RBC ghost cell.
6. Separation of RBC membrane proteins by SDS-PAGE.
7. Demonstration of Histidine uptake from the intestinal membrane.

Essential readings:

1. Garret, R.H., Grisham, C.M. (2016). Biochemistry (6th ed.). Boston, Cengage Learning. ISBN-10: 1305577205, ISBN-13: 978-1305577205
2. Lodish, H., Berk, A., Kaiser, C.A., Krieger, M., Bretscher, A., Ploegh, H., Martin, K.C., Yaffe, M., Amon, A. (2021). Molecular Cell Biology (9th ed.). New York, WH: Freeman & Company. ISBN-13:978-1319208523, ISBN-10:1319208525.
3. Nelson, D.L., Cox, M.M. (2021). Lehninger: Principles of Biochemistry (8th ed.). New York, WH: Freeman and Company. ISBN: 13: 978-1319381493 / ISBN-10:1319381499.
4. Voet, D., Voet. J. G. (2013). Biochemistry (4th ed.). New Jersey, John Wiley & Sons Asia Pvt. Ltd. ISBN: 978-1-11809244-6.
5. Wardhan, R., Mudgal, P. (2017). Textbook on Membrane Biology (1st ed.). Singapore, Springer. ISBN-10: 9811071004, ISBN-13: 978-9811071003

DISCIPLINE SPECIFIC ELECTIVE COURSE –DSE-9 :

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Ethology (BS-DSE-9)	**4**	**2**		**2**	Class XII pass with Biology and chemistry,	**NA**

Learning Objectives:

Ethology or Animal Behavior is the scientific study of the wild and wonderful ways in which animals interact with each other, with other living beings, and with the environment in which they live in. One important aspect pertaining to the studies on Animal Behavior is that it can be conducted anywhere and at any time, depending on the interest of the researcher. Moreover, it is not confined to the four walls of the classroom or the laboratory. Thebehavioral biology has high applied value and currently linked to conservation biology, molecular biology, behavioral ecology and integrated pest management. This course will help the learners to understand and appreciate different types of animal behaviors, their adaptive, evolutionary and practical significance.

Learning Outcomes:

Upon completion of the course, students will be able to:

- Understand types of animal behaviour and their importance to the organisms.
- enhance their observation, analysis, interpretation and documentation skills by taking short projectspertaining to Animal behaviour and emotions.
- Relate animal behaviour with other subjects such as Animal biodiversity, Evolutionary biology, Ecology,Conservation biology and Genetic basis of the behaviour.
- Realize, appreciate and develop passion to biodiversity; and will respect the nature
- Learn to evaluate and analyse human behaviour and emotions, and develop intuitive skills and empathyfor better leadership qualities

SYLLABUS FOR DSE -9

Course Contents- Theory

Unit 1: Mechanisms of Behaviour **No. of hours: 6**

Definition of Proximate and Ultimate causes of behaviour; Innate behaviour: Instinct, Fixed Action Pattern (FAP); Learning: Associative learning: Classical and Operant conditioning; Non-associative learning: Habituation, Imprinting; Code breakers.

Unit 2: Patterns of Behaviour **No. of hours: 7**

Reflexes: Types of reflexes, reflex path, characteristics of reflexes (latency, after discharge, summation, fatigue,inhibition) and its comparison with complex behaviour. Orientation: Primary and Secondary orientation; Kinesis-orthokinesis, klinokinesis; Taxis-tropotaxis and klinotaxis; menotaxis (light compass orientation).

Unit 3: Social Behaviour and Sociobiology **No. of hours: 8**

Concept of Society; Degree of sociality; Insect society-Honey bee as example; Society organization and caste system, Polyethism vs Polymorphism; Dance as means of communication; Altruism and Reciprocal altruism; Hamilton‟s rule and inclusive fitness with suitable examples.

Unit 4: Sexual Behaviour **No. of hours: 6**

Asymmetry of sex, Sexual dimorphism mate choice, Intra-sexual selection (male rivalry: competition, territoriality, infanticide), Inter-sexual selection (female choice), Consequences of mate choice for female fitness, Courtship Behaviour in stickleback fish.

Unit 5: Emotions **No. of hours: 3**

Concept of emotions, Emotional intelligence, Emotional Quotient (EQ) vs Intelligence Quotient (IQ); Components and theories of emotions

Practical

Credits: 2 **Total Hours: 60**

1. To study the nests and nesting behavior of any 5 birds.
2. To study the nests and nesting behavior of social insects (Wasps, Honeybees, Termites and Ants).
3. To study the behavioral responses of wood lice to dry and humid conditions.
4. To study Geotaxis behavior in earthworm/ Phototaxis behavior in insect larvae.
5. Study of various behavioral concepts (courtship, nesting, infanticide, territoriality) through shortvideos/films.
6. Study and actogram construction of locomotor activity of suitable animal models.
7. Construct an ethogram using suitable data to study animal behavior
8. Prepare a project report on the survey based on questions to study Emotional Quotient (EQ)
9. Visit to a Zoological Park to study and record the behavioral activities of animalsand prepare a short report.

Essential readings:

1. Alcock J. Animal Behaviour. Sinauer Associate Inc., USA.
2. McFarland D. Animal Behaviour. Pitman Publishing Limited, London, UK.
3. Vinod Kumar (2002) Biological Rhythms. Narosa Publishing House, Delhi/ Springer-Verlag, Germany
4. Manning, A., & Dawkins, M. S. (2012). An Introduction to Animal Behaviour. Cambridge: CambridgeUniversity Press.
5. Goodenough, J., McGuire, B., and Jakob, E. 2010. Perspectives on Animal Behavior. 3rd Edition. JohnWiley and Sons.
6. Passer, M.W. & Smith, R.E. (2010). Psychology: The science of mind and behaviour. New Delhi: TataMcGraw-Hill.

Suggested readings:

1. Mandal, F.B. (2015).Textbook of Animal Behaviour. Delhi: PHI Pvt. Ltd.
2. Sherman, P. W., & Alcock, J. (2013). Exploring Animal Behavior, Sinauer Associate Inc., Massachusetts.
3. Martin, P. and Bateson, P. 1986. Measuring Behaviour: An Introductory Guide. Cambridge University Press.
4. Dugatkin, L.A. 2013. Principles of Animal Behavior. 3rd Edition.WW Norton and Co