KAKATIYA UNIVERSITY

Under Graduate Courses (Under CBCS 2019 - 2022)

B.Sc. ZOOLOGY II Year

SEMESTER – III

ANIMAL PHYSIOLOGY AND ANIMAL BEHAVIOUR

Theory	**4 Hours/Week**	**4 Credit**	**Internal marks = 20**
Practical	**3 Hours/Week**	**1 Credit**	**External Marks = 80**

UNIT – I

1.1 Digestion

1.1.1 **Enzymes:** Definition, Classification, Inhibition, Regulation
1.1.2 Digestion of Carbohydrates, Proteins, Lipids and Cellulose
1.1.3Absorption and Assimilation of digested food
1.1.4 Role of Gastrointestinal hormones in digestion

1.2 Excretion, Homeostasis and Osmoregulation

1.2.1 Classification of Animals on the basis of excretory products: Ammonotelic, Ureotelic, and Uricotelic; Structure and function of Nephron
1.2.2Urine formation and Counter current mechanism
1.2.3 Concept and Mechanism of Homeostasis
a) Hormone regulation of Blood Glucose levels in Human being
b) Water and Ionic Regulation by Marine and Fresh water Animals
c) Thermo regulation in Human being
1.2.4. Osmoregulation in Marine, Fresh and Brackish water Animals

UNIT – II

2.1 Respiration

2.1.1Definition of Respiration, Respiration mechanism, External, Internal and Cellular Respiration.
2.1.2 Respiratory Pigments; Transport of Oxygen, Oxygen dissociation curves, and Bohr's Effect;
2.1.3 Transport of Carbon dioxide, Chloride shift
2.1.4 Regulation of Respiration; Nervous and Chemical Mechanism

2.2 Circulation

2.2.1 Types of Circulation Open and Closed; Structure of Mammalian Heart
2.2.2 Types of Hearts: Myogenic and Neurogenic
2.2.3 Heart functions - Conduction and Regulation of Heart beat, Regulation of Heart rate; ECG
2.2.4 Tachycardia and Bradycardia; Blood Clotting mechanism

UNIT– III

3.1 Muscle Contraction

3.1.1Types of Muscles
3.1.2 Ultra structure of skeletal muscle fibre
3.1.3 Mechanism and Chemical changes during Muscle Contraction (Sliding filament theory)
3.1.4 Twitch Tetanus summation and Treppe fatigue

3.2 Nerve Impulse

3.2.1 Structure of Neuron
3.2.2 Nerve impulse - Resting potential, Threshold potential and Action potential, Conduction of Nerve impulse
3.2.3 Transmission of Nerve impulse
3.2.4 Synapse and Synaptic transmission; Neurotransmitters-EPSP, IPSP

3.3 Endocrine System

3.3.1 Endocrine glands - Structure, secretions and functions of Pituitary gland
3.3.2 Thyroid, Parathyroid, Adrenal glands and Pancreas
3.3.3 Hormone action and Concept of Secondary messengers
3.3.4 Male and Female Hormones; Hormonal control of Menstrual cycle in human beings

UNIT – IV

4.1 Animal Behaviour

4.1.1 Types of Behaviour- Innate and Acquired; Instinctive and Motivated behaviour
4.1.2 Taxes, Reflexes, Tropisms

4.2 Learning and Memory

4.2.1 **Types of Learning**: Trial and Error Learning, Imprinting, Habituation
4.2.2 **Conditioning:** Classical Conditioning; Instrumental conditioning, Examples of Conditioning, Pavlov's Experiment

4.3 Social Behaviour and Communication

4.3.1 Social behaviour of insects (Dance language of honey bees)Colonial Existence of Bees and Termites; Pheromones

4.4 Biological Rhythms

4.4.1 Biological Clocks, Circadian Rhythms; solar and lunar Rhythms; Circannual Rhythms

Suggested Readings:

1. **Gerard J. Tortora and Sandra Reynolds Garbowski** *Principles of Anatomy and Physiology*, Tenth Ed., John Wiley & Sons
2. **Arthur C. Guyton MD**, *A Text Book of Medical Physiology*, Eleventh ed., JohnE. Hall, Harcourt Asia Ltd.
3. **William F. Ganong**, *A Review of Medical Physiology*, 22 ed, McGraw Hill, 2005
4. **Sherwood, Klandrof, Yanc, Animal** *Physiology*, Thompson Brooks/Coole, 2005.
5. **Sherwood, Klandrof, Yanc,** *Human Physiology*, Thompson Brooks/Coole, 2005.
6. **Knut Scmidt-Nielson,** *Animal Physiology***,** 5th edition, Cambridge Low Price Edition.
7. **Roger Eckert and Randal,** *Animal Physiology***,** 4th ed, Freeman Co, New York**.**
8. **Singh. H.R,** Text Book of Animal Physiology and Biochemistry
9. **Nagabhushanam**, Comparative Animal Physiology
10. **Veer Bal Rastogi,** Text Book of Animal Physiology
11. **Dasmann**, "Wild Life Biology"
12. **ReenaMathur,** "Animal Behaviour"
13. **Alocock,** "Animal Behaviour- an Evolutionary Approach

****

KAKATIYA UNIVERSITY

Under Graduate Courses (Under CBCS 2019 - 2022)

B.Sc. ZOOLOGY II Year

SEMESTER – III

ANIMAL PHYSIOLOGY AND ANIMAL BEHAVIOUR (PRACTICAL)

Instruction: 3 hrs per week
No. of Credits: 1

1. Qualitative tests for identification of carbohydrates, proteins and fats
2. Qualitative tests for identification of ammonia, urea and uric acid (Nitrogenous excretory products)
3. Zonation of gut in Cockroaches
4. Study on effect of pH and Temperature on salivary amylase activity
5. Study of permanent histological sections of mammalian endocrinal glands: Pituitary, Thyroid, Pancreas, Adrenal gland
6. Estimation of Haemoglobin by Sahli's method
7. Estimation of Blood Clotting time
8. Estimation of total protein by Biuret's method
9. Estimation of unit metabolism of fish

- **Laboratory Record work shall be submitted at the time of practical examination**
- **Computer aided techniques should be adopted as per UGC guide lines.**

Suggested manuals:

Tortora, G.J. and Derrickson, B.H. (2009).*Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.
Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill
Guyton, A.C. and Hall, J.E. (2011). T*extbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006).*Biochemistry*.VI Edition. W.H Freeman and Co.
Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009).*Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.
Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper'sIllustrated Biochemistry*. XXVIII Edition.Lange Medical Books/Mc Graw3Hill.