

UNIVERSITY OF KOTA, KOTA

SYLLABUS AND COURSE SCHEME

ACADEMIC YEAR: 2020-21

BACHELOR OF SCIENCE- ZOOLOGY III SEMESTER



B. Sc. III Semester

Z- 301. Paper I: Animal Diversity - III (Protochordata to Agnatha)

Z- 302. Paper II: Biochemistry and Immunology

Z- 303. Practical: Exercise based on papers I and II.

Z- 301. Paper I: Animal Diversity - III (Protochordata to Agnathaa)

UNIT-I

1. Chordata: Primary chordate characters
2. Protochordata (invertebrate chordates), concept of invertebrate and nonchordates.
3. Salient features and outline classification of Protochordata.
4. Affinities of Protochordata.

UNIT-II

1. Hemichordata : General characters and classification up to class level.
2. **Balanoglossus**: Habit, habitat, external features, coelom, body wall, digestive, skeletal systems.
3. **Balanoglossus**: Circulatory, respiratory, excretory, nervous and sense organs, reproductive system, Tornaria larva.
4. Affinities of Hemichordata.

Unit - III

1. Urochordata: General characters and classification up to class level.
2. **Herdmania**: Habit, habitat, external features, general anatomy, body wall, digestive, skeletal systems.
3. **Herdmania**: Circulatory, respiratory, excretory, nervous and sense organs, reproductive system, Ascidian tadpole and its metamorphosis.
4. Affinities of Urochordata.

UNIT-IV

1. Cephalochordata: General characters and classification up to class level.
2. **Branchiostoma** (Amphioxus): Habit, habitat, external features, general anatomy, body wall, digestive, skeletal systems.
3. **Branchiostoma** (Amphioxus): Circulatory, respiratory, excretory, nervous and sense organs, reproductive system, larva.
4. Affinities of Cephalochordata.

UNIT- V

1. Agnatha: Salient features and examples. Origin, ancestry and diversity of vertebrates.
2. Living Agnatha – Cyclostomata: Classification up to class level and characters with suitable examples.
3. *Petromyzon*: General morphology and Ammocoete larva.
4. Affinities of Cyclostomata.

Z- 302. Paper II: Biochemistry and Immunology

Unit –I

1. Biochemistry: - Definition. General biochemistry of cell–Ions, trace elements, micro and macro molecules.
2. Structure of Carbohydrates, Protein, Lipids and Nucleic Acids.
3. Cell metabolism: - Anabolic and catabolic process, metabolism of protein, carbohydrates and fats, ketone bodies.

Unit - II

1. Energy transfer, redox, cytochrome-system.
2. Enzyme: Nomenclature, classification, mechanism and specificity, enzyme activator, inhibitor, regulation and control of enzyme activity.
3. Basics of Immunity: Types of immunity: Active, passive, innate and acquired immunity, Antigens and antibodies, types of antibodies and their structure. Interferons, cytokines (haptens). Mechanism of reactions: Precipitation, agglutination, neutralisation, opsonisation.

Unit - III

1. Cells and Organs in Immunity: Humoral and cell- mediated immunity.
2. B and T cells. Lymphocytes: Helper, killer, memory and suppressor cells.
3. Complement system, secondary lymphoid organs; tonsils, adenoids, thymus, bone marrow, *bursa fabricus*, macrophages, Antigen - antibody reaction.

Unit-IV

1. Immune disorders and techniques: Basic idea of immune disorders.
2. Auto-immune diseases, AIDS, mechanism of HIV infection.
3. Monoclonal antibodies and their production, Applications of monoclonal antibodies; ELISA.

Unit – V

1. Vaccines and Transplants: Vaccination and immunization.
2. Vaccines; hepatitis vaccine, attenuation (oral polio vaccine), Antivenoms.
3. Organ transplants: Various types of transplant (allograft, xenograft, autograft), major histocompatibility complex.

Z- 303. Practical: Exercise based on papers I and II

1. Study of animal diversity through museum specimens:-

Balanoglossus, Herdmania, Doliolum, Salpa, Oikopleura, Amphioxus, Petromyzon, Myxine, Bdellostoma, ammocoete larva.

2. Study of sections of organs and developmental stages:

Hemichordata - T.S. through proboscis, collar and trunk regions of *Balanoglossus*, tornaria larva.

Urochordata : Pharyngeal wall, spicules and tadpole larva of *Herdmania*. **Cephalochordata:** T.S. of Branchiostoma through oral hood, pharynx, gonads and caudal region.

3. Dissections: Through Chart / Model / Photograph / CD

3. a. Major –

Balanoglossus – Coelome, digestive and nervous system.

Herdmania - general anatomy, digestive and respiratory systems.

Branchiostoma - general anatomy, digestive, reproductive and nervous system.

3. b. Minor –

Spicules and pharyngeal wall of *Herdmania*, W. M. of *Branchiostoma*.

4. Biochemistry

Qualitative estimation of --

(1) Protein (2) Fat (3) Carbohydrate (4) Catalase enzyme in animal tissue.

5. Immunology

(a) ELISA test (b) Elementary knowledge about Immunological tests.

B.Sc. (Semester-III) - Zoology Practical Examination 2019

Distribution of Marks

Time – 4hrs	Max. Marks–50
1. Major Dissection - Through Chart / Model / Photograph / CD	05
2. Minor Dissection - Through Chart / Model / Photograph / CD	04
3. Slide Preparation	04
4. Biochemical exercise	04
5. Immunological exercise	03
6. Spots (10 X 2)	20
7. Record	05
10. Viva-voce	05
Total	50