JYOTI NIVAS COLLEGE AUTONOMOUS BANGALORE – 560 095
DEPARTMENT OF ZOOLOGY
B.Sc. III SEMESTER ZOOLOGY PAPER III SYLLABUS (2024 SEP BATCH)
ANATOMY AND HISTOLOGY

COURSE TITLE	**ANATOMY AND HISTOLOGY**
COURSE CODE	**24IIIZL3T**
COURSE CREDITS	**3**
TOTAL CONTACT HOURS	**56 HOURS**
DURATION OF ESA	**3 HOURS**
FORMATIVE ASSESSMENT MARKS	**20 MARKS**
SUMMATIVE ASSESSMENT MARKS	**80 MARKS**

Course Out comes (COs): After the successful completion of the course, the student will be able to:

CO1: Demonstrate a thorough understanding of the human body's anatomical structures including bones, muscles, organs and systems.

CO2: Study the comparative account of organs of vertebrates and their functions.

CO3: Acquire the knowledge of structure of brain, sense organs and excretory organs to a complex, highly evolved form in mammal.

CO4: Understand the microscopic organization of tissues and organs through histological studies.

CO5: To comprehend the fundamental principles of micro technique, identifying the role of various reagents in the preparation of tissue samples.

Content	56 hrs
Unit I	**14 hrs**
Human Anatomy - 1 • Anatomy of Digestive system - Structure of alimentary canal and accessary glands (Liver and Pancreas). • Anatomy of Respiratory system – Overview of conducting part and respiratory zone. • Anatomy of Circulatory system - V.S of Heart, blood vessels – arteries, veins and capillaries, Arterial system and venous system. • Anatomy of Excretory system - Structure of kidney, structure of nephron. • Anatomy of Nervous system – CNS, PNS and ANS, structure of brain and spinal cord. Neurons, its types, Glial cells and its types,	
Unit II	**14 hrs**
Human Anatomy – 2 and Osteology • Anatomy of Reproductive system – structure of male and female reproductive systems. • Sense organs - Eye and Ear. • Skeletal system - Types of bones and functions, Axial and appendicular skeletal system (except bones of hand and foot). • Joints and their types – Immovable joints, slightly movable joints and freely movable. • Synovial joint – L.S of synovial joint, types – Ball & socket, hinge, saddle, plane, condyloid and pivot joints.	
Unit III	**14 hrs**
Comparative Anatomy • Respiratory organs in Fishes (cartilaginous fish gills) and swim bladders, respiratory organs in Amphibians (lung), Reptiles, Birds and Mammals (rat lung). • Comparative anatomy of heart and evolution of aortic arches in vertebrates. • Evolution of kidney in vertebrates - Pronephros, Mesonephros and Metanephros of vertebrates. • Comparative anatomy of brain in vertebrates.	
Unit IV	**14 hrs**
Histology • Introduction to histology - Tissues and its types - Epithelial tissues; connective tissue (loose and dense); skeletal tissue and muscular tissue. • Micro-technique - Steps in histological techniques (fixation, dehydration, embedding, sectioning, mounting and staining); Common fixatives and stains used in double staining; Uses of alcohol, xylene and DPX. • Histological features of mammalian organs - Tongue, Stomach, Small intestine, Pancreas, Spleen, Liver, Kidney, Adrenal, Thyroid, Testis and Ovary.	

Pedagogy: Lectures, Presentations, Videos, Assignments and Weekly Formative Assessment Tests

Formative Assessment for Theory	
Assessment Occasion / type	**Marks**
House Examination/Test	10
Written Assessment/Presentation/Project/Term Papers/Seminars	05
Classroom Performance/Participation	05
Total	**20 Marks**

BLUEPRINT FOR QUESTION PAPER
Paper III

Unit	**Teaching (hrs)**	**Number of Questions**			**Total Marks**
		12 (3 Marks)	08 (5 Marks)	04 (10 Marks)	
Unit 1	14	3	2	1	29
Unit 2	14	3	2	1	29
Unit 3	14	3	2	1	29
Unit 4	14	3	2	1	29
Total	**56 hrs**	**12x3=36**	**8x5=40**	**4x10=40**	**116**

III SEMESTER ZOOLOGY -PAPER III
ANATOMY AND HISTOLOGY
PRACTICAL

COURSE TITLE	**ANATOMY AND HISTOLOGY PRACTICAL**
COURSE CODE	**24IIIZL 3P**
COURSE CREDITS	**2**
TOTAL CONTACT HOURS	**48 HOURS**
DURATION OF ESA	**3 HOURS**
FORMATIVE ASSESSMENT MARKS	**10 MARKS**
SUMMATIVE ASSESSMENT MARKS	**40 MARKS**

Course Outcomes (COs): After the completion of the course, the student will be able to:
CO1: To understand the anatomical structure of organs of human body.
CO2: To comprehend the intricate structure of human skeletal system.
CO3: To appreciate the comparative account of different organs of vertebrates.
CO4: Develop proficiency in staining different histological tissues for proper viewing and understanding.

Sl. no	**Practical Contents**	**15 Units**
1	**Human Anatomy:** Virtual Display / Model / Photos: Structure of Lung, Heart, Brain and Kidney	2
2	**Human Osteology:** Skull, Lower jaw, vertebral column (Cervical, thoracic and lumbar and sacrum), pectoral and pelvic girdles, limb bones (except bones of hand and foot).	3
3	Comparative anatomy of skin of Vertebrates – Fish, Frog, Bird and Rat.	1
4	**Comparative Anatomy:** Study of derivatives of integument in Vertebrates - Carapace and Plastron of Tortoise/Turtle, horn of Sheep/Goat/Cow, hoof of Sheep/ Goat/Cow, feathers of birds	1
5	Comparative anatomy of heart of Vertebrates: Fish (Shark), Amphibian (Frog), Bird, (Pigeon) and Mammal (Rat).	1

6	Comparative anatomy of brain of Vertebrates: Fish (Shark), Amphibian (Frog), Bird (Pigeon) and Mammal (Rat).	1
7	**Histology:** Permanent slides of sections of mammalian organs - Tongue, small intestine, Pancreas, Liver, Kidney, Thyroid, Adrenal, Ovary and Testis.	4
8	Micro-technique: Preparation and Staining.	1
9	Histology as diagnostic tool: Uterine-Adenoid cystic carcinoma and Prostate carcinoma or any available slides or photographs.	1

Pedagogy: Lectures, Presentations, Videos, Assignments and Weekly Formative Assessment Tests

Formative Assessment for Practical	
Assessment Occasion/type	**Marks**
House Examination/Test	05
Class room Performance/Participation	05
Total	**10 Marks**

References:

1. Gerard J Tortora and Nicholas P. Anagnostakos. 13th Ed. Principles of Anatomy and Physiology.
2. Clemente C D. 1981. Anatomy- A Regional Atlas of The Human Body, Urban and Schwarzenberg Publications 2nd Edition.
3. Chaurasia B D. 1986. Human Anatomy- Regional and Applied Upper Limb and Thorax, Cbs Publishers and Distributors.
4. Preves M, Lysenkov N, Bushkovich V. 1985.Human Anatomy, Mir Publications.
5. Vimala C.M, 2006. Introductory Zoology Vol. IV, Interline Publishing, Bangalore.
6. Grove & Newell, 1990. Animal Biology, Universal Book Stall, New Delhi, 9th Ed.
7. Hilderbrand. 1988 Analysis of Vertebrate Structure John Wiley and Sons, New York, 3rd Ed.
8. Kotpal R.L.1991.Vertebrates, Rastogi Publications, Meerut
9. Kotpal R.L.1993. Zoology Phylum Series, Rastogi Publications, Meerut
10. Kulshrestha S.K.1999.Comparative Anatomy of Vertebrates, Anmol Publications.
11. Vimala C.M, 2006. Introductory Zoology Vol. IV, Interline Publishing, Bangalore.
12. Frederick R. Bailey. Bailey's Textbook of Histology
13. Vimala C.M. 2006. Introductory Zoology Vol. V, Interline Publishing, Bangalore.
14. Brijesh kumar. 2013. Histology: Text & Atlas

SCHEME OF PRACTICAL EXAMINATION

III Semester Zoology -Paper III

Anatomy and Histology

Duration: 3 hrs **Max. Marks: 40**

1.	**Human Anatomy:** Identify the given spotter / organ **A** and comment with labelled diagram.	04 marks
2.	**Human Osteology:** Identify the given spotter **B** and **C** comment with labelled diagram.	08 marks
3.	**Comparative Anatomy**: Identify **D** and **E** and comment on the evolutionary trends with labelled diagrams.	08 marks
4.	**Histology:** Identify and comment on the histological features of **F** and **G** with neat labelled diagrams.	10 marks (2 x 5 = 10)
5.	**Micro-technique:** Differential staining of the given slide.	05 marks
6.	**Class Records**	05 marks
	Total	**40 marks**

Scheme of Valuation

1. Human Anatomy: Identification – **01M**; Comments – **02M**; diagram – **01M**
2. Human Osteology: Identification – **01M**; Comments – **02M**; diagram – **01M**
3. Comparative Anatomy: Identification – **01M**; Comments with diagram – **03M**
4. Histology: Identification – **01M**; Comments – **03M**; diagram – **01M**
5. Micro-technique: Staining process Performance – **05M**