


| Part A: Introduction | | | |
|------------------------------------|--------------------------------|---|---|
| Program: Certificate Course | | Class: B.Sc. I Year | Year: 2022 Session: 2022-2023 |
| 1 | Course Code | ZOOL- 2T | |
| 2 | Course Title | Cell Biology, Histology and Comparative Anatomy & Physiology of Chordates | |
| 3 | Course Type | Theory | |
| 4 | Pre-requisite (if any) | To study this course, a student must have/had the subject Biology in class 12 th . | |
| 5 | Course Learning Outcomes (CLO) | <p>At the end of this course, the students will be able :</p> <ul style="list-style-type: none"> • Understand the basic structure, functioning of the cell and cell organelles and understand the intricate cellular mechanisms involved. • Understand the tissues, how tissues are produced from cells in a normal course and about any malfunctioning which may lead to benign or malignant tumor. • Develop an understanding of the evolution of vertebrates thus integrating structure, function and development. • Understand the morphological, anatomical and physiological adaptation in diverse habitats. • 5. Develop an understanding of the evolution of vertebrates thus integrating structure, function and development. | |
| 6 | Credit Value | Theory : 4 | |
| 7 | Total Marks | Max. Marks: 50 | Min Passing Marks : 17 |

| Part B: Content of the Course | | |
|-------------------------------|--|-----------------|
| Total Lecturer: 60 | | |
| Unit | Topics | No. of Lectures |
| I | <p>Prokaryotic and Eukaryotic cells : General structure of prokaryotes, bacteria, archaea and eukaryotes. Ultra structure and function of endoplasmic reticulum, ribosomes, Golgi apparatus, lysosome, Mitochondria, nuclear apparatus.</p> <p>Cell membrane and transport mechanism : Structure, composition, models and function. Fluid mosaic model Junctional complexes, membrane receptor modifications : microvilli, desmosomes and plasmodesmata.</p> | 12 |
| II | <p>Cell cycle, cell signaling and cell culturing : Cell cycle, cell division – mitosis and meiosis. Cell division check points and their regulation. Role of growth factors. Programmed cell death (Apoptosis).</p> <p>Cell regulation and cell signaling : Signaling molecules and their receptors. Functions of cell surface receptors. Regulation of signaling pathways.</p> <p>Cell culture : Types of cell culture – monolayer and suspension culture. Types of culture media. Basic characteristics of tissue culture media. Tissue culture and engineering.</p> | 12 |
| III | <p>Structure and functional significance of animal tissues : Introduction to tissues. Epithelial tissue: types, structure and characteristics. Exocrine and endocrine glands: type and structure. Structure and function of loose, dense and adipose tissue. Muscular tissue: Ultra structure of smooth, skeletal and cardiac muscles. Muscle contraction. Membrane of the brain and spinal cord.</p> | 11 |
| IV | <p>Structure and function of integument, skeletal, digestive, circulatory system :</p> <p>Integument : Structure of integument from fish to mammals. Function of integument. Epidermal and dermal derivatives of integument and their functional significance.</p> <p>Skeletal system : Comparative account of pelvic and pectoral girdles from fishes (cartilaginous and bony) to mammals.</p> <p>Digestive system : Dentition in mammals. Comparative study of alimentary canal and digestive glands from fish to mammal. Physiology of digestion in mammal.</p> | 13 |

Handwritten signature and date:
 31/5-2022

| | | |
|--|--|----|
| | Circulatory system: Evolution of aortic arches and their significance. Structure and evolution of heart in vertebrates. Cardiac cycle. Blood : Composition and function. | |
| V | Structure and function of circulatory, respiratory, excretory, reproductive and endocrine system : Respiratory system : Aquatic and terrestrial respiration. Comparative anatomy of lungs in amphibian, reptile, bird and mammals. Excretory system : Physiology of excretion, urine formation. Reproductive system : Comparative details of testes and ovaries from fishes to mammals. Estrous and menstrual cycle. Endocrine system : Types and functional significance of endocrine glands and hormones. | 12 |
| Keywords: Tissue, Endocrine glands, Girdles, Cell signaling, Cell culture, Excretion, Circulatory system, Aortic arches, Heart, Reproductive cycle. | | |

| Part C - Learning Resource | |
|--|--|
| Text Books, Reference Books, Other Resources - | |
| <ol style="list-style-type: none"> Books of M. P. Hindi Granth Academy Rastogi V. B. : Introduction to Cytology Cell Biology and Molecular Biology : N. Arumugam Cell Biology : N. Arumugam Molecular Cell Biology : N. Arumugam Cell Biology, Genetics, Molecular Biology and Evolution : Verma P. S., Agrawal V. K. Sheelar and Binachi : Cell and Molecular Biology Karp : Cell and Molecular Biology De Robertis : Cell and Molecular Biology Powar C. B. : Cell Biology A Textbook of Animal Histology : A. K. Berry, Emkey Publication, Delhi A Textbook of Histology and Practical guide: J. P. Gunasegram Animal Cell Culture : R. Freshney Animal Cell and Tissue Culture : Shivangi Mathur Chordate Zoology : R. L. Kotpal & P. S. Verma Modern Text Book of Zoology – Vertebrate : R. L. Kotpal A Text Book of Chordates : A. Thangamani, N. Arumugam, Saras Publication Biology of Animals, Volume – II, Sinha, Adhikari, Ganguly Comparative Anatomy of vertebrates, 2nd edition : R. K. Saxena, Sunita Saxena Comparative Anatomy and Developmental Biology : Kotpal, Shastry and Shukla Chordata and Comparative Anatomy : R. L. Kotpal Chordate Zoology : Jordan E. L. and Verma P. S. Anatomy of Chordates, 4th edition : Weichert C. K. Comparative vertebrate Anatomy : L. H. Hyman | |
| E-Resources – <ol style="list-style-type: none"> SWAYAM- https://swayam.gov.in/explorer?searchText= https://academic.oup.com https://medineplus.gov https://ncin.nlon.nih.gov https://zoologylearningpoint.woodpress.com https://zoologyresources.com National digital library – https://ndl.iitkgp.ac.in e-PG Pathshala (MHRD) Portal, https://egpg.inflibnet.ac.in Science Direct Open Access Content – https://www.sciencedirect.com/book/9781843342038/ open – Access https://egyankosh.ac.in | |

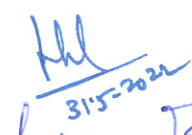
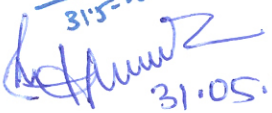
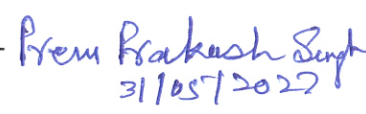

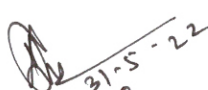
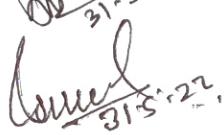
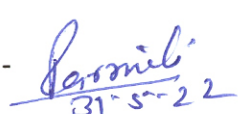
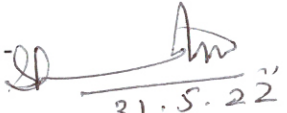
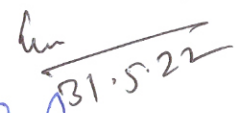
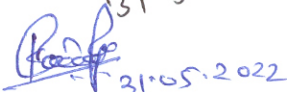
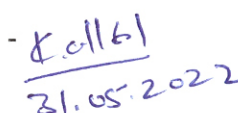

 Dr. K. P. Sahu
 31-5-2022

Part D: Assessment and Evaluation

University Exam(UE): Maximum Marks: 50 Marks

DECLARATION

This is to certify that the syllabus is framed by the central board of study (Zoology) as the guidelines of the department of higher education, Chhattisgarh.

- | | | | | |
|---|---|----------|----|---|
| 1. Dr. K. R. Sahu | - | Chairman | - |  31.5.2022 |
| Assistant Professor, Govt. Pandit Madhav Rao Sapre College, Pendra Road | | | | |
| 2. Dr. Ajit Hundet | - | Member | -- |  31.05.22 |
| Professor, Govt. D. B. Girls College, Raipur | | | | |
| 3. Dr. Prem Praksah Singh | - | Member | - |  31/05/2022 |
| Professor, Govt. College, Kusmi | | | | |
| 4. Dr. Shubhada Rahalkar | - | Member | - |  31.5.22 |
| Professor, Govt. Bilasa Girls P. G. College, Bilaspur | | | | |
| 5. Dr. Anil Kumar Shrivastava | - | Member | - |  31.5.22 |
| Professor, Govt. V. Y. T. P. G. Autonomous College, Durg | | | | |
| 6. Dr. R. K. Tamboli | - | Member | - |  31.5.22 |
| Assistant Professor, Kirodimal Govt. Arts & Science College, Raigarh | | | | |
| 7. Dr. Parmita Dubey | - | Member | - |  31.5.22 |
| Assistant Professor, Govt. J. Y. Chhattisgarh College, Raipur | | | | |
| 8. Dr. Shashi Gupta | - | Member | - |  31.5.22 |
| Assistant Professor, Govt. Nagarjuna P. G. College of Science, Raipur | | | | |
| 9. Dr. L. P. Miri | - | Member | - |  31.5.22 |
| Assistant Professor, Govt. J.P. Verma P. G. Arts & Commerce College, Bilaspur | | | | |
| 10. Dr. Rajesh Kumar Rai | - | Member | - |  31.05.2022 |
| Assistant Professor, Govt. Mahamaya College, Ratanpur, Bilaspur | | | | |
| 11. Dr. Kavita Krishnamoorti | - | Member | - |  31.05.2022 |
| Assistant Professor, Govt. Lahiri P. G. College, Chirimiri, Koriya | | | | |

Date : 31.05.2022