

BSC ZOOLOGY IV SEMESTER
[January 2020- June 2020 (ESE Summer 2020)]

CODE	DESCRIPTION	PD/W	EXAM	CIA	ESE	TOTAL
BSZO 411	COMPARATIVE ANATOMY OF CHORDATES	3	3hrs	20	80	100
BSZO412	ANIMAL EMBRYOLOGY	3	3hrs	20	80	100
BSZO421	ZOOLOGY LAB IV	6	3hrs	20	80	100
TOTAL				60	240	300

BSZO411 COMPARATIVE ANATOMY OF CHORDATES

Unit I:- Integument including structure & development of placoid scales, Feathers, & Hairs. Jaw suspensorium.
 Unit II: Comparative anatomy of Alimentary Canal, Respiratory System- Pisces, Amphibia, Reptiles, Aves & Mammals.
 Unit III: Heart and aortic arches, Urino genital system - Pisces, Amphibia, Reptiles, Aves & Mammals.
 Unit IV: Comparative anatomy of Brain & Eye- Pisces, Amphibia, Reptiles, Aves & Mammals.
 Unit V: Comparative anatomy of Endocrine systems - Pisces, Amphibia, Reptiles, Aves & Mammals. General accounts of Hormones & Mechanism of Hormone action.

BSZO412 ANIMAL EMBRYOLOGY

Unit I: Gametogenesis, Vitellogenesis, Types of eggs & sperms, Parthenogenesis, Physiology of fertilization.
 Unit II: Cleavage - Planes & Patterns of cleavage & significance, Fate map. Blastulation, Gastrulation & its Significance.
 Unit III: Development of *Branchiostoma* up to gastrulation, Chick egg & its development up to formation of primitive streak. Extra embryonic membranes of chick.
 Unit IV Placenta - Types & function of Placenta in Mammals, Various types of stem cells & their applications
 Unit V: Cloning of Animals: Nuclear Embryonic Transfer technique, Nuclear transfer technique, Twins - Identical Siemens & Fraternal Twins, **test tube babies (IVF- In vitro fertilization)**, Artificial inseminations, Teratogenesis

BSZO421 ZOOLOGY LAB IV

- A. Dissections -
 - Labeo* – General Anatomy, Brain, cranial nerves V,VII, IX, and X, Weberian ossicles
- B. Microscopic Preparation- Cycloid scales
- C. Osteology – Articulated and disarticulated bones of –*Gallus,Oryctolagus*
- D. Identification and Systematic Position up to order of following Museum Specimens Identification and Systematic Position up to order of following Museum Specimens-
 - Pisces- *Protopterus, Labeo, Heteropneustes, Wallago, Clarias, Anabas, Exocoetus, Echeineis.*
 - Amphibia- *Amphiuma, Necturus, Hyla, Bufo*
 - Reptiles- *Naja, Bungarus, Echeis, Hydrophis, Eryx, Ptyas, Crocodilus, Gavialis*
 - Aves- *Columba, Streptopelia, Passer*
 - Mammals – *Pteropus, Presbytis, Maccaca*
- E. Study of Prepared Slides- *Scoliodon* – T.S gills, Scroll valve
 Amphibia - T.S and L.S of developmental stages
 Aves – V.S of skin
 Chick embryology – Whole Mount of developmental stages of chick of 18, 24, 36, 48, 72 hours
 Mammals – T.S through various organs- Thyroid, Testes, Ovary Adrenal Gland, Pancreas
- F. Experimental Zoology -
 1. **Detection of vitamin A in cod liver oil**
 2. **Detection of vitamin D in cod liver oil**
 3. **Preparation of different stages of chick embryological development.**
 4. **Study / collection of different types of feather**
 5. **To study action of salivary amylase enzyme.**

Distribution of Marks	Marks Allotted	Time duration 3hrs
1. Dissection – Major	22	
Minor		
2. Microscopic Preparation –	12	
3. Spots – (5 x 4)	20	
4. Experimental zoology	16	
5. Year Work/ Practical Record – (CIA)	10	
6. Practical Class Test - (2 x 5 Marks) (CIA)	10	
7. Viva Voice -	10	
Total	100	

Suggested Readings-

1. Text book of Zoology Vol-11 Vertebrates – Parker & Haswell (Edited by Marshall &Williams) (ELBS & Macmillan)
2. Vertebrate life- Pough and McFerland
3. Life of Vertebrates. J. Z. Yong
4. The Vertebrate body- Romer & Parsons
5. Biology of Vertebrates- Walter & Sayles
6. Analysis of Vertebrate Structure- Hildebrand
7. Comparative Anatomy of Vertebrates- G.C. Kent & R. Carr
8. Chordate Zoology and Animal Physiology – by E.L.Jordan, and P.S.Verma, S. Chand Publication
9. Chordate Zoology – R.L. Kotpal , Rastogi Publication, Meerut
10. Developmental Biology – Scott Gilbert – PB- Palgrave Publication
11. Foundations Of Embryology – Bradley M Patten And Carlson
12. Introduction To Embryology – B.I Balinsky- Thomson Nelson Publication
13. Embryology – Rajendra Kausik – Oxford Book Co
14. Text Book Of Embryology - D.R. Khanna- Discovery Publishing House