

COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES

THEORY

(CREDITS 4)

Unit 1

1.1 Integumentary System

Derivatives of integument

1.2 Skeletal System

Evolution of visceral arches

1.3 Digestive System

Brief account of alimentary canal and digestive glands

1.4 Respiratory System

Brief account of Gills, lungs, air sacs and swim bladder

Unit 2

2.1 Circulatory System

Evolution of heart and aortic arches

2.2 Urinogenital System

Evolution of kidney and urinogenital ducts

2.3 Nervous System

Comparative account of brain

2.4 Sense Organs

Different types of receptors,

Unit 3 Early Embryonic Development

3.1 Gametogenesis and fertilization in mammals

3.2 Types and patterns of cleavage

3.3 Blastulation and gastrulation

3.4 Role of primary organisers

Unit 4 Late Embryonic Development and control

4.1 Extra embryonic membranes

4.2 Types of placenta

4.3 Basic processes in development (gene activation, determination, induction)

4.4 Basic processes in embryonic development (differentiation, intra cellular communications, cell movement and cell death)

COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES

PRACTICAL

(CREDITS 2)

1. Osteology: Disarticulated skeleton of frog, varanus, fowl and rabbit.
2. Study of frog and chick embryology
3. Study of the different types of placenta- histological sections through permanent slides or photomicrographs.
4. Dissection of following animals to expose different systems:
 - 3 Scoliodon
 - 4 Frog
 - 5 Rat

SUGGESTED READINGS

- Kardong, K.V. (2005) *Vertebrates' Comparative Anatomy, Function and Evolution*. IV Edition. McGraw-Hill Higher Education.
- Kent, G.C. and Carr R.K. (2000). *Comparative Anatomy of the Vertebrates*. IX Edition. The McGraw-Hill Companies.
- Hilderbrand, M and Gaslow G.E. *Analysis of Vertebrate Structure*, John Wiley and Sons.
- Walter, H.E. and Sayles, L.P; *Biology of Vertebrates*, Khosla Publishing House.
- Gilbert, S. F. (2006). *Developmental Biology*, VIII Edition, Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts, USA.
- Balinsky, B.I. (2008). *An introduction to Embryology*, International Thomson Computer Press.
- Carlson, Bruce M (1996). *Patten's Foundations of Embryology*, McGraw Hill, Inc.