

**ANDHRA MAHILA SABHA**  
**Arts & Science College for Women**  
**(AUTONOMOUS), NAAC Re-accredited**  
**O.U. Campus, Hyderabad.**  
**B.Sc.I Year, Semester- I**  
**Syllabus Animal Diversity – Invertebrates**  
**Discipline Specific Course, Paper – I2017-18**

**Sub code: ZOO 101**

Instruction:	45Hrs (4 hrs./ week)
Duration of End Semester Examination:	3Hrs (80 M)
Duration of Sessional Examination :	1hr (20M)
Semester Examination:	80 M
Sessional Examination :	20 M

**UNIT – I**

**(15 Periods)**

**1.1 Brief history of Invertebrates**

- 1.1.1 Kingdom Animalia
- 1.1.2 Brief history of Invertebrates

**1.2 Protozoa**

- 1.2.1 General characters
- 1.2.2 Classification up to classes with examples
- 1.2.3 *Elphidium-structure, lifecycle*
- 1.2.4 Locomotion & Reproduction in Protozoa
- 1.2.5 Protozoan diseases of human importance

**1.3 Porifera**

- 1.3.1 General characters
- 1.3.2 Classification of Porifera up to classes with examples
- 1.3.3 Canal system in sponges
- 1.3.4 Skeleton in sponges

**UNIT – II**

**(15 Periods)**

**2.1. Cnidaria**

- 2.1.1 General characters
- 2.1.2 Classification of Cnidaria up to classes with examples
- 2.1.3 *Obelia – Structure, Differences of Medusa & Polyp, Life cycle*
- 2.1.4 Corals and coral reef formation

**2.2 Platyhelminthes**

- 2.1.1 General characters
- 2.1.2 Classification of Platyhelminthes up to classes with examples
- 2.1.3 *Schistosoma- structure, life history*

**2.3 Nematelminthes**

- 2.3.1 General characters
- 2.3.2 Classification of Nematelminthes up to classes with examples
- 2.3.3 *Dracunculus- structure, life history*
- 2.3.4 Parasitic Adaptations in Helminthes.

## UNIT – III

(15 Periods)

### 3.1 Annelida

- 3.1.1 General characters
- 3.1.2 Classification of Annelida up to classes with examples
- 3.1.3 *Hirudinaria granulosa*-External features, Digestive system, Excretory system & Reproductive system
- 3.1.4 Coelome and Coelomoducts in Annelida .

### 3.2 Arthropoda

- 3.2.1 General characters
- 3.2.2 Classification of Arthropoda up to classes with examples
- 3.2.3 Prawn-External features, Digestive system, Respiratory System
- 3.2.4 Economic importance of Insects
- 3.2.5 Insect metamorphosis
- 3.2.6 *Peripatus* - Structure and affinities

## UNIT – IV

(15 Periods)

### 4.1 Mollusca

- 4.1.1 General characters
- 4.1.2 Classification of Mollusca up to classes with examples
- 4.1.3 *Pila* - Digestive system, Respiratory System
- 4.1.4 Torsion and detorsion in gastropods.

### 4.2 Echinodermata

- 4.2.1 General characters
- 4.2.2 Classification of Echinodermata up to classes with examples
- 4.2.3 Water vascular system in star fish
- 4.2.4 Echinoderm larvae and their significance

### 4.3 Hemichordata

- 4.3.1 General characters
- 4.3.2 Classification of Hemichordata up to classes with examples
- 4.3.3 *Balanoglossus* – Affinities & Systematic position of *Balanoglossus*.

## Suggested Readings

1. **L.H. Hyman** ‘*The Invertebrates*’ Vol I, II and V. – M.C. Graw Hill Company Ltd.
2. **Kotpal, R.L. 1988 - 1992** Protozoa, Porifera, Coelenterata, Helminthes, Arthropoda, Mollusca, Echinodermata. Rastogi Publications, Meerut.
3. **E.L. Jordan and P.S. Verma** ‘*Invertebrate Zoology*’ S. Chand and Company.
4. **R.D. Barnes** ‘*Invertebrate Zoology*’ by: W.B. Saunders CO., 1986.
5. **Barrington. E.J.W.**, ‘*Invertebrate structure and Function*’ by ELBS.
6. **P.S. Dhama and J.K. Dhama**. *Invertebrate Zoology*. S. Chand and Co. New Delhi.
7. **Parker, T.J. and Haswell** ‘*A text book of Zoology*’ by, W.A., Mac Millan Co. London.
8. **Barnes, R.D. (1982)**. *Invertebrate Zoology*, V Edition

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**B.Sc. I Year SEMESTER- II**  
**Discipline Specific Course, Paper – II**

**Sub code: ZOO 101**

Instruction:	45Hrs (4 hrs./ week)
Duration of End Semester Examination:	3Hrs (80 M)
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Semester Examination:	80 M
Sessional Examination :	20 M

**UNIT – I**

**(15Periods)**

**1.1 Ecology - I**

- 1.1.1 Ecosystem structure and functions.
- 1.1.2 Types of Ecosystems –Aquatic: pond and Terrestrial: grass land
- 1.1.3 Nutritive cycles – Nitrogen cycle & Carbon cycle.
- 1.1.4 Energy flow in ecosystem.
- 1.1.5 Food chain, food web and ecological pyramids.
- 1.1.6 Animal Associations - Mutualism, commensalism, parasitism, competition, Predation.

**UNIT – II**

**(15 Periods)**

**2.1 Ecology – II**

- 2.1.1 Population characteristics-Growth curves
- 2.1.2 Population Control mechanisms-Density dependent, Density Independent.
- 2.1.3 Biotic Community: Characteristics
- 2.1.4 Ecological Succession-Xerosere & Hydrosere.
- 2.1.5. Pollution-Air pollution, Water pollution & Soil pollution.
- 2.1.6. Bioremediation

**UNIT – III**

**(15 Periods)**

**3.1 Zoogeography**

- 3.1.1 Zoogeographical realms and characteristic fauna – Oriental, Australian And Ethiopian regions
- 3.1.2 Wallace line, Discontinuous distribution
- 3.1.3 Biodiversity: Value of Indian Biodiversity, hotspots of Biodiversity in India.
- 3.1.4. Wildlife Importance, National parks and Sanctuaries of India, Conservation strategies
- 3.1.5 Project Tiger, Project Crocodile & Project Elephant.

**UNIT – IV**

**(15 Periods)**

**4.1 Animal Behaviour**

- 4.1.1 Types of Behaviour- Instinctive and Motivated behavior.
- 4.1.2 Taxes and Reflexes
- 4.1.3 Physiology and phylogeny of learning, trial and error learning, Imprinting, habituation, Classical conditioning, Instrumental conditioning

4.1.5 Social behavior, Communication and Pheromones

4.1.6 Biological Clocks- Circadian rhythms, lunar rhythms & solar rhythms

### **Suggested Readings**

**M.P.Arora**, '*Ecology*' Himalaya Publishing company.

**P.D.Sharma**, '*Environmental Biology*'.

**P.R.Trivedi and Gurdeep Raj**. '*Environmental Ecology*'

**Buddhadev Sarma and Tej Kumar**, '*Indian Wildlife Threats and Preservation*

**Chapman J.L. and Reiss M.J**, '*Ecology Principles and Applications*, Second Ed., Cambridge University Press, London.

**Benny Joseph**, '*Environmental Studies*, TATA McGraw Hill Com., New Delhi.

**Eugene P. Odum**, '*Fundamentals of Ecology* Third Ed., NataraJ Publishers, Dehradun.

**Veer Bala Rastogi**, "Ecology and Animal Distribution"

**P.K. Gupta**, "Text Book of Ecology and Environment"

**Bhatnagar and Bansal**, "Ecology and Wildlife biology"

**Dasmann**, "Wild life Biology"

**Reena Mathur**, "Animal Behaviour"

**Alocock**, "Animal Behaviour- an Evolutionary Approach"

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**B.Sc. II Year - SEMESTER III**

**Discipline Specific Course, Paper – III**

**Animal Diversity- Vertebrates and Developmental Biology- 2018-19**

**Sub code: ZOO 201**

Instruction:	45Hrs (4 hrs./ week)
Duration of End Semester Examination:	3Hrs (80 M)
Duration of Sessional Examination :	1hr (20M)
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**UNIT – I Chordates Characters and Classification up to orders (15 Periods)**

**1.1. Urochordata, Cephalochordata, Cyclostomata**

- 1.1.1. Salient features of Urochordata and Cephalochordata
- 1.1.3. General characters of Cyclostomata
- 1.1.4.. General characters of Fishes.
- 1.1.5. General characters and Classification of Amphibia up to orders with examples
- 1.1.6. General characters and Classification of Reptiles up to orders with examples
- 1.1.7 General characters and Classification of Aves up to orders with examples.
- 1.1.8. General characters and Classification of Mammalia up to orders with examples

**UNIT – II Chordate Modifications & Adaptations (15 Periods)**

**2.1. Fishes, Amphibians, Reptiles, Aves & Mammals**

- 2.1.1. Types of Scales and Fish migration
- 2.1.2. Parental care in amphibian
- 2.1.3. Mesozoic reptiles
- 2.1.4. Migration in Birds
- 2.1.5 Flight adaptation in Birds
- 2.1.6 Dentition in mammals.

**UNIT – III Comparative anatomy of vertebrates ( *Scoliodon, Rana, Calotes , Columba*) (15 Periods)**

- 3.1.1. Digestive system in Vertebrates.
- 3.2.2. Respiratory system in Vertebrates
- 3.2.3 Development of heart and aortic arches, structure of heart
- 3.2.4. Nervous system-Brain
- 3.2.4. Reproductive System in Vertebrates

**UNIT – IV (15 Periods)**

**4.1 Developmental Biology and Embryology**

- 4.1.1 Retrogressive metamorphosis and its significance in Urochordata
- 4.1.2 Gametogenesis (Spermatogenesis and Oogenesis)
- 4.1.3 Fertilization
- 4.1.4 Types of eggs
- 4.1.5 Types of cleavages

- 4.1.6 Formation of Foetal membrane in chick embryo and their functions
- 4.1.7 Types and functions of Placenta in mammals
- 4.1.8 Regeneration in Turbellaria and Lizards

**Suggested Readings:**

1. **E.L.Jordan and P.S. Verma** '*Chordate Zoology*' - S. Chand Publications.
2. **Mohan P.Arora.** '*Chordata – I*, Himalaya Publishing House Pvt.Ltd.
3. **Marshal, Parker and Haswell** '*Text book of Vertebrates*'. ELBS and McMillan, England.
4. **Alfred Sherwood Romer.** Thomas S. Pearson '*The Vertebrate Body*, Sixth edition, CBS college Publishing, Saunders College Publishing
5. **George C. Kent, Robert K. Carr.** *Comparative Anatomy of the Vertebrates*, 9th ed. McGraw Hill.
6. **Kenneth Kardong** *Vertebrates: Comparative Anatomy, Function and Evolution*, 4th ed, 'McGraw Hill.
7. **J.W. Young,** *The Life of Vertebrates*, 3rd ed, Oxford University press.
8. **Harvey Pough F, Christine M. Janis, B. Heiser,** *Vertebrate Life*, Pearson, 6th ed, Pearson Education Inc.2002.

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**B.Sc. II Year SEMESTER -IV**  
**Discipline Specific Course, Paper – IV**  
**Cell Biology, Genetics & Evolution -2018-19**

**Sub code: ZOO 251**

Instruction:	45Hrs (4 hrs./ week)
Duration of End Semester Examination:	3Hrs (80 M)
Duration of Sessional Examination :	1hr (20M)
Semester Examination:	80 M
Sessional Examination :	20 M

**UNIT – I**

**(15 Periods)**

**1. Cell Biology**

- 1.1. Cell theory, Differences of Prokaryotic and Eukaryotic cells
- 1.2. Structure and functions of plasma membrane: Structure, composition of Plasma membrane, fluid mosaic model.
- 1.4. Structure and functions of cell organelles –Endoplasmic reticulum, Golgi body, Ribosomes, Lysosomes, Mitochondria and Nucleus
- 1.1.5 Chromosomes – Structure, types, giant chromosomes: Polytene and lamp brush chromosomes.
- 1.1.6 Cell Division - Mitosis, Meiosis.
- 1.1.7. Cell cycle and its regulation.

**UNIT – II**

**(15 Periods)**

**2. Molecular Biology**

- 2.1 DNA (Deoxyribo Nucleic Acid) - Structure
- 2.2 RNA (Ribo Nucleic Acid) - Structure, types
- 2.3 DNA Replication
- 2.4 Protein Synthesis – Transcription and Translation
- 2.5 Gene Expression – Genetic Code; operon concept: Lac operon
- 2.6 Molecular Biology Techniques- Polymerase Chain Reaction.

**UNIT – III**

**(15 Periods)**

**3. Genetics**

- 3.1 Mendals laws of Inheritance and Incomplete dominance, Co- dominance
- 3.2 Human Karyotyping and amniocentesis
- 3.3. Sex determination and sex-linked inheritance
- 3.4 Chromosomal Mutations- Deletion, Duplication, Inversion, Translocation.
- 3.5. Inborn errors of metabolism: Alkaptonuria, Phenyl ketonuria, Glycogen storage disease
- 3.6. Chromosomal disorders-Down syndrome, Patav's syndrome, Klinefelter's syndrome and Turners syndrome.

## UNIT – IV

(15 Periods)

### 4. Evolution

- 4.1. Theories of evolution – Lamarckism, Darwinism and Modern synthetic theory.
- 4.2. Evidences of Evolution and Hardy Weinberg Law.
- 4.3. Forces of Evolution – mutation, gene flow, genetic drift, and natural selection.
- 4.4. Isolation – Pre-mating and post mating isolating mechanisms
- 4.5. Speciation: Methods of speciation - Allopatric and sympatric
- 4.6. Causes and Role of Extinction in Evolution.

### Suggested readings

1. **Lodish, Berk, Zipursky, Matsudaria, Baltimore, Darnell** '*Molecular Cell Biology*' W.H. Freeman and company New York.
2. **Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008).** *Principles of Genetics*. VIII Edition. Wiley India.
3. **Snustad, D.P., Simmons, M.J. (2009).** *Principles of Genetics*. V Edition. John Wiley and Sons Inc.
4. **Klug, W.S., Cummings, M.R., Spencer, C.A. (2012).** *Concepts of Genetics*. X Edition. Benjamin Cummings.
5. **Russell, P. J. (2009).** *Genetics- A Molecular Approach*. III Edition. Benjamin Cummings.
6. **Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B.** *Introduction to Genetic Analysis*. IX Edition. W. H. Freeman and Co.
7. **Ridley, M. (2004).** *Evolution*. III Edition. Blackwell Publishing
8. **Barton, N. H., Briggs, D. E. G., Eisen, J. A., Goldstein, D. B. and Patel, N. H. (2007).** *Evolution*. Cold Spring, Harbour Laboratory Press.
9. **Hall, B. K. and Hallgrimsson, B. (2008).** *Evolution*. IV Edition. Jones and Bartlett Publishers
10. **Campbell, N. A. and Reece J. B. (2011).** *Biology*. IX Edition, Pearson, Benjamin, Cummings.
11. **Douglas, J. Futuyma (1997).** *Evolutionary Biology*. Sinauer Associates.
12. **Minkoff, E. (1983).** *Evolutionary Biology*. Addison-Wesley.
13. **James D. Watson, Nancy H. Hopkins** '*Molecular Biology of the Gene*'
14. **Jan M. Savage.** *Evolution*, 2nd ed, Oxford and IBH Publishing Co., New Delhi.
15. **Gupta P.K.,** 'Genetics'

