

GONDWANA UNIVERSITY GADCHIROLI
SEMESTER SYSTEM SYLLABUS
FOR
B.Sc. Part II
Subject- Zoology
Semester IV – Paper II
Animal Behavior and Evolution
(Paper -I)

Unit- I	Periods
Definition, Types and Adaptive nature of Behavior	05
Innate Behavior-Reflexes, taxes and instinctive behavior	05
Hypothalamus and behavior	02
Unit-II	
Imprinting, Pavlovian and Trial and Error conditioning	03
Social behavior: Aggregation, Migration and navigation,	03
Courtship (Appeasement, intentional & display movement)	03
Reproductive fighting, Dominance hierarchy	03
Unit-III	
Oparin's concept of Miller's experiments	01
Biochemical origin of life	02
Adaptive radiation in mammals	02
Parallel, Convergent and Divergent evolution	02
Recapitulation theory	02
Natural selection- Stabilizing, Directional and Disrupting	03
Unit-IV	
Populations, gene pool, gene frequency, genotype frequency	02
Hardy-Weinberg law, migration and random genetic drift	03
Mechanism of isolation	04
Mechanism and pattern of speciation	03

Semester - IV
Genetics and Genetic Engineering
(Paper -II)

Unit- I	Periods
Structure of DNA and RNA. Types of RNA Concept of gene as cistron, muton and recon.	3
Gene regulation in Prokaryotes (Lac operon in E. coli)	2
Salient feature of genetic code.	2
Protein synthesis- Transcription and Translation.	3
Unit- II	
Genic balance mechanism of sex determination in <i>Drosophila</i> .	3
Cytoplasmic inheritance: Kappa particles in <i>Paramecium</i> , Milk factor in Mice.	3
Gene mutation and Mutagenic agents – (physical and chemical).	4
Unit-III	
Definition and Types of Eugenics. Eutelogenesis.	1
Basic concept in recombinant DNA technology	1
Isolation of gene- DNA manipulation enzyme: Nucleases, ligase, Polymerases, Alkaline phosphatase and topoisomerases	3
Gene isolation methods- shotgun Method, hybridization and reverse transcription.	3
Cloning vectors: Plasmid, Bacteriophage, Lamda, Cosmids YAC's (Yeast artificial chromosome)	2
Unit IV	
Splicing technique - Insertion of DNA and ligation using blunt ends, Cohesive ends.	2
Introduction of recombinant DNA in to host cell by Genetic transformation, Transfection, Transduction and Transgenesis.	4
Application of genetic engineering- Production of insulin, Vitamins and monoclonal Antibodies.	4

PRACTICALS

B.Sc.II (Zoology), Semester-IV

1. Study of chemotaxis and phototaxis in animals.
2. Identification of wild and mutant type Drosophila.
3. Demonstration of monohybrid by beads.
4. Demonstration of Dihybrid by beads.
5. Study of sickle cell anemia.
6. Study of Thalassemia.
7. Study of ABO and Rh blood groups in human society.
8. Study of Drum stick in the human blood.
9. Study of Barr body in vaginal smear or buccal epithelium.
10. Study of human genetic trait by using Hardy-Weinberg equations- Rolling of tongue, baldness, widow peak, length of index and ring finger, attached and free ear lobe.
11. Study of pictures of human chromosome abnormalities.
12. Study of pictures of Adaptive radiations in Reptilia and Mammals.
13. Study of pictures of Parallel, Convergent and Divergent evolution.
14. Study of picture of Stabilizing, Directional and Disruptional evolution.
15. Preparation of models on genetics.

Distribution of marks for Practical at the end of Semester-IV

1. Study of monohybrid/dihybrid cross by beads.	05
2. Identification of pictures (2 marks each).	08
3. Study of any human trait by using H-W equation.	06
4. Study any one of experiment (From 6 to 10).	04
5. Submission of any genetic model .	02
6. Viva-voce	02
7. Class Record	03
Total	30

Books Recommended –

Paper –I : Chordate and Developmental biology

1. T. B. of Zoology vol II – Parker & Haswell
2. T. B. of Vertebrate zoology _ S. N. Orasad
3. Vertebrate zoology –E. L. Jorden
4. Vertebrate zoology – Vishwanath
5. Zoology of chordates – Nigam H. C.
6. Phylum Chordata –n Newman H.H.
7. Biology of vertebrates –Walter & Sayles
8. The vertebrate body – Romer A. S.
9. Comparative anatomy of the vertebrates – Kingslay J. D.
10. The Biology of Amphibia – Noble G. K.
11. Snakes of India – Gharapura K. G.
12. Life of Mammals – Young J.Z.
13. Vertebrates – Kotpal R. L.
14. Introduction to Chordates – Majupuria T.C.
15. Vertebrate Zoology – Dhama & Dhama
16. T. B. Vertebrate Zoology – Agrawal
17. Protochordates – Chatterjee & Pandey
18. Protochordates – Bhatia
19. T. B. of Chordates – Bhamrah and Juneja
20. Chordate anatomy – Arora M.P.
21. The Chordates – Alexander.
22. T. B. of animal embryology – Puranik
23. T. B. of Chordate embryology – Dalella & Verma
24. T. B. of embryology – Sandhu
25. S.Y B. Sc Zoology Sem-III- Dhamani, Bakare, Harney & Bhute

26. S.Y B. Sc Zoology Sem-IV- Dhamani,Bakare,Harney & Bhute

(Paper-III) Animal Behavior and Evolution

1. Animal Behavior- M.P. Arora, Himalaya Publication New Delhi.
2. Animal Behavior- Vinod Kumar, Himalaya Publication, New Delhi.
3. Animal Behavior- N.Arumugam, Saras Publication, Nagercoil.
4. Text Book of Animal Behavior- H.S. Singh, Anmol Publications Pvt. Limited, Edition, 1999.
5. Animal Behavior- H.S. Gundevia and H.G.Singh, S.Chand Publication, New Delhi.
6. Cell Biology, Genetics, Evolution and Ecology-P.S.Verma and V.K.Agarwal, S. Chand and Company, New Delhi, edition, 1986.
7. Organic Evolution- M.P. Arora, 2010, Himalaya Publication New Delhi.
8. Organic Evolution- N.Arumugam, Saras Publication, Nagercoil.
9. Organic Evolution- Veer Bala Rastogi, Rastogi Publication, Meerut.
10. Organic Evolution- Richard Swann Lull, The Mac- Millan Company: New York, Revised edit., 1948.