



S.G.A. GOVERNMENT DEGREE COLLEGE (A)

(Re-Accredited with NAAC "A" Grade with CGPA 3.13)

Affiliated to Andhra University

YELLAMANCHILI, ANAKAPALLI DIST., ANDHRA PRADESH



B.Sc., Hons Zoology (Minor) Syllabus

I YEAR - SEMESTER –II

COURSE 1: ANIMAL DIVERSITY – I BIOLOGY OF NON- CHORDATES

Theory

Credits: 3

3 hrs/Week

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of Chemistry, Botanical, and Zoological sciences. The course aims to understand the taxonomic position and origin and evolutionary relationship of different phylum

Course outcomes:

CO1: Describe concept of animal kingdom classification and general characters of Protozoa

CO2: Classify Porifera and Coelenterata with taxonomic keys

CO3: Classify Phylum Platy & Nematelminthes using examples, parasitic adaptation

CO4: Describe Phylum Annelida & Arthropoda using examples and economic importance of vermicomposting & economic importance of insects.

CO5: Describe Mollusca, Echinodermata & Hemichordata with suitable examples in relation to the phylogeny

SYLLABUS:

UNIT-I

1.1 Whittaker's five kingdom concept.

1.2 Protozoa General Characters and classification up to classes with suitable examples

1.3 Protozoa Locomotion & nutrition

1.4 Protozoa reproduction

UNIT –II

2.1 Porifera General characters and classification up to classes with suitable examples

2.2 Canal system in sponges

2.3 Coelenterata General characters and classification up to classes with suitable examples

2.4 Polymorphism in coelenterates & Corals and coral reefs

UNIT – III

3.1 Platyhelminthes General characters and classification up to classes with suitable examples

3.2 Parasitic Adaptations in helminthes

3.3 Nematelminthes General characters and classification up to classes with suitable examples

3.4 Life cycle and pathogenicity of *Ascaris lumbricoides*

UNIT – IV

4.1 Annelida General characters and classification up to classes with suitable examples

4.2 Vermiculture - Scope, significance, earthworm species, processing, Vermicompost, economic importance of vermicompost

4.3 Arthropoda General characters and classification up to classes with suitable examples

4.4 Peripatus - Structure and affinities

UNIT – V

5.1 Mollusca General characters and classification up to classes with suitable examples

5.2 Pearl formation in Pelecypoda

5.3 Echinodermata General characters and classification up to classes with suitable examples Water vascular system in star fish

5.4 Hemichordata General characters and classification up to classes with suitable examples

Balanoglossus - Structure and affinities

REFERENCE BOOKS:

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

Student Activities

- Preparation of chart/model of phylogenic tree of life, 5-kingdom classification
- Visit to Zoology Museum or Coral Island as part of Zoological tour
 - Charts on polymorphism
 - Clay models of canal system in sponges
 - Plaster-of-paris model of Peripatus
- Construction of a vermicompost in each college, manufacture of manure by students and donating to local farmers
- Chart on pearl forming layers using clay
 - Visit to a pearl culture rearing industry/institute
 - Live model of water vascular system
- Observation of Balanoglossus for its tubicolous habit

I YEAR - SEMESTER –II
COURSE 1: ANIMAL DIVERSITY – I BIOLOGY OF NON- CHORDATES

Practical

Credits: 1

2 hrs/Week

LEARNING OBJECTIVES:

- To understand the importance of preservation of museum specimens
- To identify animals based on special identifying characters
- To understand different organ systems through demo or virtual dissections
- To maintain a neat, labelled record of identified museum specimens

SYLLABUS

Study of museum slides / specimens / models (Classification of animals up to orders)

- Protozoa: Amoeba, Paramoecium, Paramoecium Binary fission and Conjugation, Vorticella, Entamoeba histolytica, Plasmodium vivax
- Porifera: Sycon, Spongilla, Euspongia, Sycon- T.S & L.S, Spicules, Gemmule
- Coelenterata: Obelia – Colony & Medusa, Aurelia, Physalia, Velella, Corallium, Gorgonia, Pennatula
- Platyhelminthes: Planaria, Fasciola hepatica, Fasciola larval forms – Miracidium, Redia, Cercaria, Echinococcus granulosus, Taenia solium, Schistosoma haematobium
- Nematelminths: Ascaris (Male & Female), Druncunculus, Ancylostoma, Wuchereria
- Annelida: Nereis, Aphrodite, Chaetopteurs, Hirudinaria, Trochophore larva
- Arthropoda: Cancer, Palaemon, Scorpion, Scolopendra, Sacculina, Limulus, Peripatus, Larvae - Nauplius, Mysis, Zoea, Mouth parts of male & female Anopheles and Culex, Mouthparts of Housefly and Butterfly.
- Mollusca: Chiton, Pila, Unio, Pterodo, Murex, Sepia, Loligo, Octopus, Nautilus, Glochidium larva
- Echinodermata: Asterias, Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon, Bipinnaria larva
- Hemichordata: Balanoglossus, Tornaria larva

Dissections:

Computer - aided techniques should be adopted or show virtual dissections Dissection of edible (Prawn/Pila) invertebrate as per UGC guidelines

An “**Animal album**” containing photographs, cut outs, with appropriate write up about the abovementioned taxa. Different taxa/ topics will be given to different sets of students for this purpose



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SEMESTER - III

COURSE 2: ANIMAL DIVERSITY-II BIOLOGY OF CHORDATES

Theory

Credits: 3

3hrs/week

Course Objectives:

- ☐ To understand the animal kingdom.
- ☐ To understand the taxonomic position of Protochordata to Mammalia.
- ☐ To understand the general characteristics of animals belonging to Fishes to Reptilians.
- ☐ To understand the body organization of Chordata.
- ☐ To understand the taxonomic position of Protherian mammals.

Course Outcomes: By the completion of the course the graduate should be able to –

CO1: Describe general taxonomic rules on animal classification of chordates

CO2: Classify Protochordata to Mammalia with taxonomic keys

CO3: Understand Mammals with specific structural adaptations

CO4: Understand the significance of dentition and evolutionary significance

CO5: Understand the origin and evolutionary relationship of different phyla from Protochordata to Mammalia.

SYLLABUS:

UNIT - I

1.1 General characters and classification of Chordata up to classes

1.2 Salient features of Cephalochordata, Salient features of Urochordata

1.3 Structure of *Herdmania*, Life Cycle and Retrogressive metamorphosis –Process and Significance

1.4 Cyclostomata, General characters, Comparison of Petromyzon and Myxine

Activity: Model preparation /Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT - II

2.1 General characters of Fishes, Salient features of Dipnoi

2.2 *Scoliodon*: External features, Digestive system, Respiratory system

2.3 *Scoliodon* Structure and function of Heart, Structure and functions of the Brain.

2.4 Migration in Fishes, Types of Scales

Activity: Model preparation/Assignment/Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above **Evaluation:** Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT - III

- 3.1 General characters of Amphibia, General characters of Reptilia
- 3.2 *Rana hexadactyla*: External features, Respiratory system, Structure and function of Heart
- 3.3 *Rana hexadactyla* structure and functions of the Brain
- 3.4 *Calotes*: External features, Digestive system, structure and function of Brain
- 3.5 Identification of Poisonous snakes

Activity: *Model preparation /Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above*

Evaluation: *Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity*

UNIT - IV

- 4.1 General characters of Aves
- 4.2 *Columba livia*: External features, Digestive system, Respiratory system
- 4.3 *Columba livia*: Structure and function of Heart, structure and function of Brain
- 4.4 Migration in Birds, Flight adaptation in birds

Activity: *Model preparation/Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above*

Evaluation: *Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity*

UNIT - V

- 5.1 General characters of Mammalia
- 5.2 Classification of Mammalia up to sub - classes with examples
- 5.3 Dentition in mammals, Adaptations in Aquatic mammals

Activity: *Model preparation/Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above*

Evaluation: *Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity*

Co-curricular activities (suggested)

- ☐ Preparation of charts on Chordate classification (with representative animal photos) and retrogressive metamorphosis
- ☐ Clay models of Herdmania and Amphioxus
- ☐ Visit to local fish market and identification of local cartilaginous and bony fishes
- ☐ Maintaining of aquarium by students
- ☐ Model of fish heart and brain
- ☐ Preparation of slides of scales of fishes
- ☐ Visit to local/nearby river to identify migratory fishes and prepare study notes
- ☐ Preparation of Charts on above topics by students (Eg: comparative account of vertebrate heart/brain/lungs, identification of snakes etc.)
- ☐ Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc., and/or their skeletons
- ☐ Additional input on types of snake poisons and their antidotes (student activity).
- ☐ Collection of bird feathers and submission of report on Plumology
- ☐ Taxidermic preparation of dead birds for Zoology Museum
- ☐ Map pointing of prototherian and metatherian mammals
- ☐ Chart preparation for dentition in mammals

REFERENCE BOOKS

- ❖ J.Z. Young, 2006. The life of vertebrates. (The Oxford University Press, New Delhi). 646 pages. Reprinted
- ❖ Arumugam, N. Chordate Zoology, Vol. 2. Saras Publication. 278 pages. 200 figs.
- ❖ A.J. Marshall, 1995. Textbook of zoology, Vertebrates. (The McMillan Press Ltd., UK). 852 pages. (Revised edition of Parker & Haswell, 1961).
- ❖ M. Ekambaranatha Ayyar, 1973. A manual of zoology. Part II. (S. Viswanathan Pvt. Ltd., Madras).
- ❖ P.S. Dhami & J.K. Dhami, 1981. Chordate zoology. (R. Chand & Co.). 550 pages.
- ❖ Gurdarshan Singh & H. Bhaskar, 2002. Advanced Chordate Zoology. Campus Books, 6 Vols., 1573 pp., tables, figs.
- ❖ A.K. Sinha, S. Adhikari & B.B. Ganguly, 1978. Biology of animals. Vol. II. Chordates. (New Central Book Agency, Calcutta). 560 pages.
- ❖ R.L. Kotpal, 2022. Modern textbook of zoology, Vertebrates. (Rastogi Publ., Meerut). 632 pages.
- ❖ E.L. Jordan & P.S. Verma, 1998. Chordate zoology. (S. Chand & Co.). 1092 pages.
- ❖ G.S. Sandhu, 2005. Objective Chordate Zoology. Campus Books, vii, 169 pp.
- ❖ Sandhu, G.S. & H. Bhaskar, H. 2004. Textbook of Chordate Zoology. Campus Books, 2 vols., xx, 964 p., figs.
- ❖ Veena, 2008. Lower Chordata. (Sonali Publ.), 374 p., tables, 117 figs.

SEMESTER - III

COURSE 2: ANIMAL DIVERISTY-II BIOLOGY OF CHORDATES

Practical

Credits: 2

2 hrs/week

LEARNING OBJECTIVES

- ☐ To understand the importance of preservation of museum specimens
- ☐ To identify animals based on special identifying characters
- ☐ To understand different organ systems through demo or virtual dissections
- ☐ To maintain a neat, labeled record of identified museum specimens

SYLLABUS:

1. Protochordata: *Herdmania*, *Amphioxus*, *Amphioxus* T.S through pharynx.
2. Cyclostomes: *Petromyzon* and *Myxine*.
3. Pisces: *Pristis*, *Torpedo*, *Hippocampus*, *Exocoetus*, *Echeneis*, *Labeo*, *Catla*, *Clarius*, *Channa*, *Anguilla*.
4. Amphibia: *Ichthyophis*, *Amblystoma*, *Axolotl* larva, *Hyla*,
5. Reptilia: *Draco*, *Chamaeleon*, *Uromastix*, *Testudo*, *Trionyx*, *Russels viper*, *Naja*, *Krait*, *Hydrophis*, *Crocodile*.
6. Aves: *Psittacula*, *Eudynamis*, *Bubo*, *Alcedo*.
7. Mammalia: *Ornithorhynchus*, *Pteropus*, *Funambulus*.
8. **Dissections**-As per UGC guidelines
 - Scoliodon* IX and X, Cranial nerves
 - Scoliodon* Brain
 - Mounting of fish scales
9. Project Report on Identification of locally available fishes and Faunal Diversity

Note: 1. Dissections are to be demonstrated through virtual lab.(Amruta Lab)_
2. Laboratory Record work shall be submitted at the time of practical examination.

REFERENCE WEB LINKS:

- ☐ <https://nt7-mhe-complex-assets.mheducation.com/nt7-mhe-complex-assets/Upload-20190715/InspireScience6-8CA/LS15/index.html>
- ☐ <https://themammallab.com/>
- ☐ <http://abacus.bates.edu/acad/depts/biobook/LabConCh.htm>
- ☐ <https://virtualzoology.wordpress.com/scoliodon/>
- ☐ <http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf>



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SEMESTER-IV
COURSE 3: EMBRYOLOGY

Theory

Credits: 3

3 hrs/week

Course Objectives:

The objective of this course is to provide a comprehensive understanding of the concepts of early animal development, methodologies specifically used to study the process of embryonic development in animals, students familiar with different approaches that have been used to study embryology.

Course Outcomes:

The overall course outcome is that the student shall develop deeper understanding of concepts of embryology. This course will provide students with a deep knowledge in embryology by the completion of the course the graduate shall able to –

CO1: Understand the historical perspective and concepts of embryology

CO2: Acquire knowledge on gametogenesis, fertilization and cleavage patterns

CO3: Understand the fate of germinal layers and extraembryonic membranes

CO4: Explain the process of regeneration in certain animals

CO5: Examine the process of organogenesis

SYLLABUS:

UNIT-I:

1.1 Historical perspective and basic concepts: Phases of development

1.2 Cell-Cell interaction, Pattern formation, Differentiation and growth

1.3 Differential gene expression

1.4 Cytoplasmic determinants and asymmetric cell division

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above

Evaluation: Instructor supposed to prepare detailed Rubrics for the evaluation of the above activity

UNIT-II:

2.1 Gametogenesis, Spermatogenesis, Oogenesis

2.2 Types of eggs, Egg membranes; Fertilization (External and Internal)

2.3 Types of Blastulae; Fate maps

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above/Model preparation on cleavage planes

Evaluation: Instructor supposed to prepare detailed Rubrics for the evaluation of the above activity

UNIT-III:

- 3.1 Early development of frog and chick up to gastrulation, Fate of Germ Layers
- 3.2 Extra-embryonic membranes
- 3.3 Placenta (Structure, types and functions of placenta)
- 3.4 Amniocentesis

Activity: *Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above/Chart preparation on the placenta*

Evaluation: *Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity*

UNIT-IV:

- 4.1 Metamorphosis: Changes, hormonal regulations in amphibians
- 4.2 Regeneration: Modes of regeneration, epimorphosis, morphallaxis and compensatory regeneration (in Turbellarians)
- 4.3 Teratogenic agents and their effects on embryonic development

Activity: *Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above /Flow chart preparation on the process of metamorphosis highlighting the periodical changes vs hormone activity*

Evaluation: *Instructor supposed to prepare detailed Rubrics for the evaluation of the above activity*

UNIT-V:

- 5.1 Organogenesis of Central Nervous system in Human
- 5.2 Organogenesis of Eye, Ear in Human
- 5.3 Organogenesis of Circulatory system in Human
(* Organogenesis in Human need to be explained)

Activity: *Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above /Flow chart preparation on the process of organogenesis highlighting the gradual developments of organ systems*

Evaluation: *Instructor supposed to prepare detailed Rubrics for the evaluation of the above activity*

Co-curricular activities (Suggested)

- Preparation of models of different types of eggs in animals
- Chart on frog embryonic development, fate map of frog blastula, cleavage etc.
- Chart on the organogenesis
- RBPT on the Placenta
- Model of extra embryonic membrane
- Laboratory observation of chick embryonic development

REFERENCES BOOKS:

- Developmental Biology by Balinsky
- Developmental Biology by Gerard Karp
- Chordate embryology by Varma and Agarwal
- Embryology by V.B. Rastogi
- Austen CR and Short RV. 1980. *Reproduction in Mammals*. Cambridge University Press.
- Gilbert SF. 2006. *Developmental Biology*, 8th Edition. Sinauer Associates Inc., Publishers, Sunderland, USA.
- Longo FJ. 1987. *Fertilization*. Chapman & Hall, London.
- Rastogi VB and Jayaraj MS. 1989. *Developmental Biology*. Kedara Nath Ram Nath Publishers, Meerut, Uttar Pradesh.
- Schatten H and Schatten G. 1989. *Molecular Biology of Fertilization*. Academic Press, New York.

SEMESTER-IV
COURSE 3: EMBRYOLOGY

Practical

Credits: 1

2 hrs/week

LEARNING OBJECTIVES

- The objective of this course is to provide a comprehensive practical knowledge on the embryology
- Must develop a critical understanding of the early embryological events
- Acquire knowledge on the developmental stages of chick
- Understand the histology of placenta

SYLLABUS:

1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages)
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages)
3. Study of different sections of placenta (photomicrograph/ slides)
4. Project report on chick embryo development

REFERENCE WEB LINKS:

- <https://praxilabs.com/en/3d-simulations/cultivation-and-preparation-of-the-virus-in-chick-embryo-virtual-lab>
- <https://vlab.amrita.edu/>
- <https://www.vlab.co.in/>
- https://www.youtube.com/watch?v=p_tx88He8Pk
- <https://core.ac.uk/download/143957972.pdf>
- <https://egyankosh.ac.in/bitstream/123456789/57549/1/Exercise%207%20Chick%20Embryo.pdf>
- http://www.macollege.in/app/webroot/uploads/departement_materials/doc_501.pdf
- <http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf>



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SEMESTER-IV

COURSE 4: ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS

Theory

Credits: 3

3 hrs/week

Course Objectives:

The objective of this course is to provide knowledge of organ systems function, the ability to integrate physiology from the cellular and molecular level to the organ system and organismic level of organization, to gain a deep knowledge of current topics in physiology.

Course Outcomes:

The overall course outcome is that the student shall develop deeper understanding of concepts of Physiology.

CO1: Understand the physiology of digestion and hormonal control of digestion

CO2: Develop a comprehensive picture of respiratory physiology

CO3: Acquire knowledge on the Renal physiology

CO4: Understand the physiology of Nerve and muscle

CO5: Understand the physiology of heart

SYLLABUS:

UNIT-I: Physiology of Digestion

1.1 Nutrition- type of nutrition, Vitamins and minerals

1.2 Digestive glands and chemical digestion of food;

1.3 Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins;

1.4 Gastrointestinal hormones.

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above /Chart preparation on the hormonal control of secretion of enzymes

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT-II: Physiology of Respiration

2.1 Pulmonary ventilation; Mechanism of respiration, Respiratory volumes and capacities;

2.2 Transport of oxygen in blood and dissociation curves and the factors influencing it

2.3 Transport of Carbon dioxide in blood; dissociation curves and the factors influencing it, Carbon monoxide poisoning

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above /Group discussion on the CO poisoning/Debate on the dissociation curves

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT-III: Renal Physiology

- 3.1 Structure of kidney and Structure of Nephron
- 3.2 Mechanism of urine formation
- 3.3 Regulation of water balance
- 3.4 Regulation of acid-base balance

Activity: *Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above /Group discussion on the Urine formation/Working model of Kidney*
Evaluation: *Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity*

UNIT-IV: Physiology of exciting tissues

- 4.1 Neuron structure and types
- 4.2 Nerve impulse transmission-(Myelinated, Non-myelinated, synaptic)
- 4.3 Ultra structure of striated muscle
- 4.4 Sliding Filament Theory of muscle contraction

Activity: *Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above /Group discussion on the impulse transmission/Debate on the dissociation curves*
Evaluation: *Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity*

UNIT- V: Physiology of Heart

- 5.1 Structure of mammalian heart,
- 5.2 Structure and working of conducting myocardial fibers. Origin and conduction of cardiac impulses
- 5.3 Cardiac Cycle
- 5.4 Nervous and chemical regulation of heart rate. Blood pressure and its regulation

Activity: *Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watching any video on the above /Group discussion on the phases of Cardiac output /case study on the Blood Pressure*
Evaluation: *Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity*

Co-curricular activities (Suggested)

- Chart on cardiac cycle, human lung, kidney/nephron structure etc.
- Working model of human / any mammalian heart.
- Working model of human / any mammalian urine formation
- Chart/model of sarcomere
- Chart/model on nerve impulse transmission

REFERENCES BOOKS:

- Eckert H. *Animal Physiology: Mechanisms and Adaptation*. W.H. Freeman & Company.
- Floray E. *An Introduction to General and Comparative Animal Physiology*. W.B. Saunders Co., Philadelphia.
- Goel KA and Satish KV. 1989. *A Text Book of Animal Physiology*, Rastogi Publications, Meerut, U.P.
- Hoar WS. *General and Comparative Physiology*. Prentice Hall of India, New Delhi.
- Lehninger AL. Nelson and Cox. *Principles of Biochemistry*. Lange Medical Publications, New Delhi.
- Prosser CL and Brown FA. *Comparative Animal Physiology*. W.B. Saunders Company, Philadelphia.

SEMESTER-IV
COURSE 4: ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS

Practical

Credits: 1

2 hrs/week

LEARNING OBJECTIVES

- To acquire knowledge of anatomy of certain important organs.
- To develop the ability to test the biological sample like saliva and urine.
- To Effectively estimate the blood haemoglobin.
- To Acquire skill to use the sphygmomanometer in recording blood pressure.
- To observe the ECG

SYLLABUS:

1. Examination of sections of mammalian oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung, kidney
2. Study of activity of Salivary amylase at different P^H and Temperature
3. Qualitative tests for identification of Carbohydrates
4. Qualitative tests for identification of Proteins
5. Qualitative tests for identification of Fats
6. Urine test for sugar, albumin
7. Estimation of haemoglobin using Sahli's haemoglobinometer
8. Recording of blood pressure using a sphygmomanometer
9. ECG observation- Spotting/identification of curves from the given ECG

REFERENCE WEB LINKS:

- <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>
- <https://library.csi.cuny.edu/oer/virtuallabs-simulations#anatomy>
- <https://www.labster.com/simulations?course-packages=animal-physiology>
- <http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf>
- [https://physiology.elte.hu/gyakorlat/jegyzet/Physiology_Pactical_\(2013\).pdf](https://physiology.elte.hu/gyakorlat/jegyzet/Physiology_Pactical_(2013).pdf)



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SEMESTER-V

COURSE 5: POULTRY MANAGEMENT-I (POULTRY FARMING)

Theory

Credits: 3

3 hrs/week

Course Objectives: The objective of this course is to provide Concept of Poultry Farming

Course Outcomes:

CO1: Evaluate the status of Indian Poultry Industry

CO2: Explain the Scientific Poultry keeping

CO3: Compare the diversified Poultry practices

CO4: Inspect the different breeds of chicken

SYLLABUS:

Unit 1 Indian poultry Industry

- 1.1 Importance of poultry farming and poultry development in India.
- 1.2 Present status and future prospectus of poultry Industry
- 1.3 Classification of poultry based on genetics Utility

Unit -2 Scientific Poultry Keeping

- 2.1 Modern breeds of Chicken
- 2.2 Present day egg production lines- meat production lines
- 2.3 Mini breeds- dwarfism in mini-Leghorns

Unit-3 Diversified Poultry

- 3.1 Ducks and Geese-classification- rearing system-classification-advantages
- 3.2 Guinea fowls - guinea fowl farming in India-Production-varieties
- 3.3 Emu-rearing- Economical aspects-commercial products

Unit-4 Desi Chickens:

- 4.1 Indigenous breeds and economical aspects of desi chicken
- 4.2 Indigenous breeds-Aseel-Chittagong-Kadakhnath-Bursa
- 4.3 Improved varieties in India- Giriraja-Vanaraja-Girirani-Kalinga brown, Gramapriya, Swarnandhra

Unit -5 Breeds from Central Avian Research Institute – Izatnagar

- 5.1 CARI Nirbheek - CARI- Shyama-HITCARI (Naked Neck Cross)
- 5.2 CARI- Priya Layer, CARI- Sonali Layer,
- 5.3 CARIBRO-VISHAL, CARI-RAINBRO,
- 5.4 Nandanam chicken-I, Nandanam Chicken-II, Nandanm-Quail

REFERENCES:

1. Text Book of Poultry Science, P V Sreenivasaiah, Write and Print Publications, ISBN No. 9788192970592, 8192970590
2. Poultry Science Practices, Nilothpal Ghosh, CBS Publication & Distributions, 2015
3. Principles of Poultry Science, 1996, CAB Publishers, ISBN 9780851991221
4. A Text Book of Animal Husbandry, C. C. Banerjee, Oxford and IBH, Publish Co, ISBN: 9788120412606

Web sources:

5. <https://www.drvet.in/p/e-books.html>
6. <https://byjus.com/biology/animal-husbandry-poultry-farming/>
7. https://www.helpforag.app/2018/02/livestock-production-and-management-lpm_14.html?m=1

SEMESTER-V
COURSE 5: POULTRY MANAGEMENT-I (POULTRY FARMING)

Practical

Credits: 1

2 hrs/week

LEARNING OUTCOMES:

On successful completion of this practical course, student shall be able to:

- Identify different types of Poultry rearing practices
- Evaluate the efficacy of different types of poultry practices in maximizing yield
- Understand the importance of different hybrid breeds in poultry

SYLLABUS:

1. Different types of Poultry rearing (Students has to observe and draw the different types of poultry rearing systems)
2. Different types of poultry Housing - Models / Images/charts
3. Different layer breeds images/charts/ Models (Observation of characters)
4. Types of broilers images/charts/ Models (Identification of important Characters)
5. CARI breeds characters –images/charts
6. Nandanam breeds- images/charts (Identification of characters)

*** (This practical is 70 % (Web based /virtual) 30% physical: student and teachers must browse the web for the specimens models – write down the important characters based on the web resources)

REFERENCES:

1. A Text Book of Animal Husbandry, C. C. Banerjee, Oxford and IBH, Publish Co, ISBN: 9788120412606
2. http://www.agritech.tnau.ac.in/expert_system/poultry/Poultry%20House%20Construction.html
3. <https://petkeen.com/best-chicken-breeds-for-eggs/>
4. <https://garden.decorexpro.com/en/hozyajstvo/ptitsevodstvo/porody-brojlernyh-kur-s-foto-i-opisaniem.html>

Co-Curricular Activities:

a) Mandatory:

1. For Teacher: Training of students by the teacher in laboratory and field on the techniques of identification of layers, broilers and management practices in poultry.
2. For Student: Students shall Individually visit a Poultry farm, make observations and report on the Rearing, Housing, Brooding, Feeding and water management activities. The student shall submit a handwritten Fieldwork/Project work Report on the observations along with pictures in the given format not exceeding 10 pages to teacher.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: *Title page, student details, index page, detailsof place visited, observations made, findings and acknowledgements.*
5. Unit tests. (IE)

b) Suggested Co-Curricular Activities

1. Web resources – visiting the websites of CARI-IZATNAGA <https://cari.icar.gov.in> procuring additional information on the poultry breeds
2. Web resources- visiting the website of NANADANAM http://www.tanuv.ac.in/ippmmadhavaram_tech.html
3. Collection of additional data on different types of Poultry breeds
4. Seminar, Assignment, Group discussion. Quiz, Collection of Material, Invited Lecture, Video preparation



S.G.A. GOVERNMENT DEGREE COLLEGE (A)

(Re-Accredited with NAAC "A" Grade with CGPA 3.13)

Affiliated to Andhra University

YELLAMANCHILI, ANAKAPALLI DIST., ANDHRA PRADESH



SEMESTER-V

COURSE 6: POULTRY MANAGEMENT-II (POULTRY PRODUCTION AND MANAGEMENT)

Theory

Credits: 3

3 hrs/week

Course Outcomes:

- CO1: Suggest measure for Health care in Poultry
- CO2: Evaluate the economics of poultry production
- CO3: Elaborate the poultry Breeder flock management
- CO 4: Differentiate the poultry hatchery practices

SYLLABUS:

Unit-1 HEALTH CARE

- 1.1 Common poultry diseases: bacterial, viral, fungal, parasitic .
- 1.2 Vaccination schedule for commercial layers and broilers . pre and post vaccination care.
- 1.3 Disinfection: Types of disinfectants; mode of action; recommended procedure; precaution and handling.

Unit-2 ECONOMICS

- 2.1 Economics of layer and broiler production
- 2.2 Feasibility studies on poultry rearing- in context of small units and their profitability.
- 2.3 Export/import of poultry and poultry products.

Unit-3 BREEDER FLOCK MANAGEMENT

- 3.1 Layer and broiler breeder flock management housing & space requirements
- 3.2 Different stage of management during life cycle; Light management during growing and laying period, Artificial insemination.
- 3.3 Feeding: Feed restriction, separate male feeding. Nutrient requirement of layer and broiler breeders of different age groups

Unit-4 BREEDER HEALTHCARE

- 4.1 Vaccination of breeder flock
- 4.2 Common diseases of breeders (Infectious and metabolic disorders)-prevention.
- 4.3 Fertility disorder- etiology, diagnosis and corrective measures.
- 4.4 Selection and culling of breeder flocks

Unit-5 HATCHERY PRACTICES

- 5.1 Management principles of incubation.
- 5.2 Factors affecting fertility and hatchability. Selection, care and incubation of hatching eggs. break even analysis of unhatched eggs
- 5.3 Fumigation; sanitation and hatchery hygiene.
- 5.4 Computer applications for hatchery management

REFERENCES:

1. HVS Chauhan, S. Roy, Poultry Diseases, Diagnosis and Treatment, New Age International Publishers-2018

Web resources:

2. <https://www.drvet.in/p/e-books.html>
3. <https://byjus.com/biology/animal-husbandry-poultry-farming/>
4. https://www.helpforag.app/2018/02/livestock-production-and-management-lpm_14.html?m=1

SEMESTER-V
COURSE 6: POULTRY MANAGEMENT-II
(POULTRY PRODUCTION AND MANAGEMENT)

Practical

Credits: 1

2 hrs/week

LEARNING OUTCOMES:

On successful completion of this practical course, student shall be able to:

- Identify Poultry diseases by observation
- Analyze Poultry establishment feasibility
- Understand the Poultry Records

SYLLABUS:

1. Poultry Viral diseases – Observation of histopathological slides
2. Poultry Fungal Diseases- Observation of histopathological slides
3. Poultry Bacterial Diseases-Observation of histopathological slides
4. Feasibility study of Poultry establishment: (Preparation of feasibility study report with given parameters)
5. Rearing of Layers – (Preparation of Flow chart
6. Rearing of broiler- Flow chart
7. Hatchery records- Model study/analysis- Report with modified data

REFERENCES:

1. HVS Chauhan, S. Roy, Poultry Diseases, Diagnosis and Treatment, New Age International Publishers-2018
2. Flow chart hatchery : <http://lms.tanuvas.ac.in/mod/resource/view.php?id=45106>
3. Feasibility report:
<https://www.manage.gov.in/stry&fcac/content/19.%20Project%20Report%20on%20Layer%20Poultry.pdf>

Co-Curricular Activities:

a) Mandatory:

1. For Teacher: Training of students by the teacher laboratory and field on skills in different practices employed in poultry with regard to the disease management – analysis of poultry project- preparation of flow chart – Observation of Poultry records – computerization activities
2. For Student: students shall (individually) visit a Layer/ Broiler Poultry farming places (small scale/corporate), make observations on practices- resources – management and marketing - analysis and submit a handwritten Fieldwork/Project work Report of 10 pages with necessary images.
3. Max marks for Fieldwork/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: *Title page, student details, index page, detail of place visited, observations made, findings and acknowledgements.*
6. (IE): Unit tests.

b) Suggested Co-Curricular Activities

1. Preparation of Poultry diseases charts
2. Preparation of feasibility report poultry establishment with different variables
Seminar, Assignment, Group discussion. Quiz, Collection of Material, Invited Lecture, Video preparation etc.