

SHIVAJI UNIVERSITY, KOLHAPUR.



Accredited By NAAC with 'A' Grade

Revised Syllabus For

Bachelor of Science

Part-II

ZOOLOGY

CBCS PATTERN

Syllabus to be implemented from

June, 2019 onwards.

B. Sc. Part II Semester- III

ZOOLOGY

PAPER-V

DSC- (ANIMAL DIVERSITY-II)

Theory: 30 hrs. (37.5 lectures of 48 minutes)

Marks-50 (Credits: 02)

Unit 1:

Protochordates: (4 hrs.)

General characters and Classification of Protochordata.

Agnatha: (4 hrs.)

General characters of Agnatha and Classification of cyclostomes up to classes.

Pisces: (4 hrs.)

General characters and Classification up to orders; Respiration in Fishes.

Amphibia: (4 hrs.)

General features and Classification up to orders; Parental care.

Unit 2:

Reptiles: (4 hrs.)

General characters and Classification up to orders; Venomous and non-venomous snakes, Biting mechanism in snakes.

Aves: (5 hrs.)

General characters and Classification up to orders; Digestive and Respiratory systems.

Mammals: (5 hrs.)

General characters and Classification up to orders; Circulatory of mammals.

B. Sc. Part II Semester- III

ZOOLOGY

Paper-VI

DSC- (BIOCHEMISTRY)

Theory: 30 hrs. (37.5 lectures of 48 minutes)

Marks-50 (Credits: 02)

Unit 1:

Nucleic acids:

DNA and RNA. (7 hrs.)

Structure and types of RNA .DNA- Secondary structure of Watson and Crick. Forms of DNA

Carbohydrate Metabolism: (8 hrs.)

Glycolysis, Krebs Cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogenolysis.

, Review of electron transport chain.

Unit 2:

Lipid Metabolism: (5 hrs.)

Biosynthesis and β oxidation of fatty acids.

Protein metabolism: (5 hrs.)

Transamination, Deamination and Urea Cycle.

Enzymes: (5 hrs.)

Introduction- classification and nomenclature. Mechanism of action, Enzyme Kinetics,

Inhibition and Regulation. Isoenzymes, Co-enzymes and Co-factors.

B. Sc. Part II Semester- IV

ZOOLOGY

Paper-VII

DSC- (REPRODUCTIVE BIOLOGY)

Theory: 30 hrs. (37.5 lectures of 48 minutes)

Marks-50 (Credits: 02)

Unit 1: Functional anatomy of female reproduction: (15 hrs.)

Outline and histological structure of female reproductive system in rat and human; Ovary: folliculogenesis, ovulation, corpus luteum formation and regression; Steroidogenesis and secretion of ovarian hormones; Reproductive cycles in human and their regulation, changes in the female tract; Ovum transport in the fallopian tubes; Sperm transport in the female tract, fertilization; Hormonal control of implantation; pregnancy diagnosis Hormonal regulation of gestation, , Mechanism of parturition and its hormonal regulation; Lactation and its regulation.

Unit 2:

Functional anatomy of male reproduction: (8 hrs.)

Outline and histology of male reproductive system in human; Testis: Cellular functions, germ cell; Spermatogenesis: hormonal regulation; Epididymal function and sperm maturation; Accessory glands functions; Sperm transportation in male tract.

Unit 3: Reproductive Health: (7 hrs.)

Infertility in male and female: causes, diagnosis and management; Assisted Reproductive Technology: sex selection, sperm banks, frozen embryos, in vitro fertilization, ET, EFT, IUT, ZIFT, GIFT, ICSI, PROST; Modern contraceptive technologies.

B. Sc. Part II Semester- IV

ZOOLOGY

Paper-VIII

DSC- (APPLIED ZOOLOGY-I)

Theory: 30 hrs. (37.5 lectures of 48 minutes)

Marks-50 (Credits: 02)

Unit 1:

Introduction to Host-parasite Relationship: (4 hrs.)

Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis.

Unit 2:

Epidemiology of Diseases: (7 hrs.)

Transmission, Prevention and control of diseases: Tuberculosis, Typhoid.

Unit 3:

Rickettsia and Spirochaetes: (6 hrs.)

Brief account of *Rickettsia prowazekii*, *Borrelia recurrentis* and *Treponema pallidum*.

Unit 4:

Insects of Economic Importance: (8 hrs.)

Biology, Control and damage caused by *Helicoverpa armigera*, *Pyrilla perpusilla* and *Papilio demoleus*, *Callosobruchus chinensis*, *Sitophilus oryzae* and *Tribolium castaneum*

Unit 5:

Poultry Farming: (5 hrs.)

Principles of poultry breeding, Management of breeding stock and broilers, Processing and Preservation of eggs.

B. Sc. Part II
ZOOLOGY PRACTICAL-I
Marks-50 (Credits: 02)

PRACTICAL-I (Based on Animal diversity-II and Biochemistry of Semester-III).

Unit: 1

Animal diversity-II:

1. Study of the following specimens with reference to morphological peculiarities and classification upto orders: *Herdmania*, *Branchiostoma*, *Petromyzon*, *Sphyrna*, *Pristis*, *Torpedo*, *Labeo*, *Exocoetus*, *Anguilla*, *Ichthyophis/Ureotyphlus*, *Salamandra*, *Bufo*, *Hyla*, *Chelone*, *Hemidactylus*, *Chamaeleon*, *Draco*, *Crocodylus*, *Gavialis*.
2. Characters identifying venomous and non-venomous snakes: Russell's viper, Saw scaled viper, Common krait, Indian Cobra, Sea snake, Rat snake and Checkered keelback.
3. Study of any six common birds from different orders with the help of photographs and keys.
4. Study of the following specimens with reference to morphological peculiarities and classification up to orders: shrews, Bat, Squirrel and Loris.

An "**animal album**" containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to students for this purpose.
5. Dissection of brain of fowl.
6. Temporary preparation of hyoid apparatus, sclerotic plates, Pecten and Collumella of fowl.
7. Temporary preparation of Cycloid, Ctenoid and Placoid scales in fishes.

Unit: 2

Biochemistry:

1. Qualitative tests to identify functional groups of carbohydrates and lipid in given solutions (Glucose, Fructose, Sucrose, Lactose and Lipid).
2. Estimation of total protein in given solutions by Lowry's method/ Quantitative estimation of amino acids by using Ninhydrin reaction.
3. Study of activity of salivary Amylase under optimum conditions.
4. Effect of Temperature, pH and salinity of activity of salivary amylase.
5. Estimation of total lipids from given sample.
6. DNA isolation from plant/animal.
7. Estimation of uric acid from bird excreta.

B. Sc. Part II
ZOOLOGY PRACTICAL-II
Marks-50 (Credits: 02)

PRACTICAL-II (Based on Reproductive Biology and Applied Zoology of Semester-IV).

Unit: 1

Reproductive Biology:

1. Study of animal house: set up and maintenance of animal house, breeding techniques, care of normal and experimental animals.
2. Examination of vaginal smear rats from live animals/Study of stages of estrus cycle through permanent slides.
3. Surgical techniques: principles of surgery in endocrinology. Ovaryectomy, hysterectomy, castration and vasectomy in rats. Demonstration or film only.
4. Examination of histological sections from photomicrographs/ permanent slides of rat: testis, epididymis and accessory glands of male reproductive systems; Sections of ovary, fallopian tube, uterus (proliferative and secretory stages), cervix and vagina.
5. Human vaginal exfoliate cytology.
6. Sperm count and sperm motility in rat/ Any mammal.
7. Study of modern contraceptive devices by photographs or models.

Unit: 2

Applied Zoology:

1. Study of arthropod vectors associated with human diseases: *Pediculus*, *Culex*, *Anopheles*, *Aedes* and *Xenopsylla*.
2. Study of insect damage to different plant parts/stored grains through damaged products/photographs.
3. Identifying feature and economic importance of *Helicoverpa (Heliothis) armigera*, *Papilio demoleus*, *Pyrilla perpusilla*, *Callosobruchus chinensis*, *Sitophilus oryzae* and *Tribolium castaneum*.
4. Field trip to poultry farm or animal breeding centre or any suitable place to study animal diversity or any place related to theory syllabus. Submission of field trip report (Printed/Hand writings).

Suggested readings for Paper V and VI:

- Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). Biochemistry. VI Edition. W.H Freeman and Co.
- Guyton, A.C. and Hall, J. E. (2011). Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
- Hall B. K. and Hallgrímsson, B. (2008). Strickberger's Evolution. IV Edition. Jones and Bartlett Publishers Inc.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). Harper's Illustrated Biochemistry. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.
- Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). Principles of Biochemistry. IV Edition. W.H. Freeman and Co.
- Pough H. (2008). Vertebrate life, 8th Edition, Pearson International.
- Young, J. Z. (2004). The Life of Vertebrates. III Edition. Oxford university press.

Suggested readings for paper VII and VIII:

- Arora, D. R and Arora, B. (2001). Medical Parasitology. II Ed. CBS Pub., and Distributors.
- Atwal, A.S. (1986). Agricultural Pests of India and South East Asia, Kalyani
- Austin, C.R. and Short, R.V. (1982). Reproduction in Mammals. Cambridge University Press, London. Vol. 1.
- Chapman, R. F. (1998). The Insects: Structure and Function. IV Edition, Cambridge University Press, UK.
- Dennis, H. (2009). Agricultural Entomology. Timber Press (OR).
- Degroot, L.J. and Jameson, J.L. (2010). (6 th eds). Endocrinology. W.B. Saunders and Company.
- Dunham R.A. (2004). Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K.
- Hafez, E. S. E. (1962). Reproduction in Farm Animals. Lea & Fabiger Publisher.
- Hatcher, R.A. *et al.* (2001). The Essentials of Contraceptive Technology. Population Information Programme.
- Knobil, *et al.* (2014). (4th eds). The Physiology of Reproduction. Raven Press Ltd.
- Park, K. (2007). Preventive and Social Medicine. XVI Edition. B.B Publishers.
- Pedigo L. P. (2002). Entomology and Pest Management. Prentice Hall Publication.