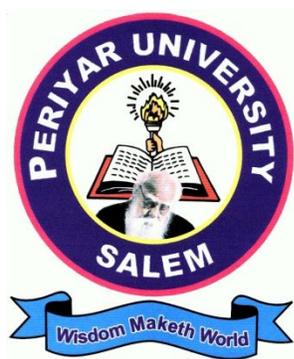


PERIYAR UNIVERSITY
PERIYAR PALKALAI NAGAR
SALEM – 636 001.



DEGREE OF BACHELOR SCIENCE
CHOICE BASED CREDIT SYSTEM
SYLLABUS FOR B. SC ZOOLOGY
BRANCH – VI

FOR THE STUDENTS ADMITTED FROM THE
ACADEMIC YEAR 2017 – 2018 ONWARDS

Definition:**Programme:**

“Programme” means core degrees offered in various disciplines.

Course:

“Course” refers to the courses offered under the degree programme spread over the complete Programme of study as under.

- Part I** - means “Tamil/other languages” offered under the programme.
- Part II** - means “English” language offered under the programme.
- Part III** - means “the core subjects” related to the programme concerned including practicals.
- Part III Allied** - means “Allied subjects” offered as allied, which is interdisciplinary in nature but related to the programme.
- Part III Electives** - means “Elective subjects” related to the core subjects of the programme concerned.
- Part IV (i)** - “Tamil” means basic orientation in Tamil language for those students who have not studied Tamil upto 12th standard.
 - (ii)** - “Advanced Tamil” means, the subject is meant for students who have studied Tamil language upto 12th standard and chosen other languages in college but would like to advance their Tamil language skills.
 - (iii)** - “Non-Major Electives” means option is being given to students who do not come under the above two categories (i & ii).
 - (iv)** - Skill based subject means the courses offered under the programme related to Advanced Skill acquisition for industrial application for which a separate Diploma will be awarded along with the Degree.
 - (iv)** - “Foundation Course” means courses offered as

- 1) Environmental Studies (1st year)
- 2) Value Education - Human Rights /Women's Rights (2nd year)

Part V

- “Extension Activities” means all those activities which form part of NSS/NCC/Sports/YRC and other co and extracurricular activities.

A detailed explanation of the above with relevant credits are given under “Scheme of Examination along with Distribution of Marks and Credits”

Duration: Means the stipulated years of study to complete a programme as prescribed by the University time to time. Currently for the undergraduate programme the duration of study is THREE years. These regulations apply to the regular course of study in approved institutions of the University.

Credits: Means the weightage given to each course of study (subjects) attributed by the experts of the Board of Studies concerned.

Credit System: Means, the course of study under this pattern, where weightage of credits are spread over to different semesters during the period of study and the Cumulative Grade Point Average will be awarded based on the credits earned by the students. The following are the total credit points:

For Undergraduate Programme (Three years) : 140

AIM AND SCOPE OF THE COURSE:

- To acquire knowledge in different areas of animal science.
- The topics included in different units of different papers would enable the students to develop technical skills in Zoological and applied branches.
- Skill based subjects like Poultry Science, Dairy Science, Human health and hygiene, Sericulture, Apiculture, Aquaculture, Biotechnology and Clinical Nutrition have been included in order to provide opportunities in employment and research in Government and Private Organizations.
- There is also scope for self employment for the students.
- Practicals included in the syllabus will improve the skills of the students in Microscopy, Observations, Drawing and Laboratory techniques.

ELIGIBILITY FOR ADMISSION:

Candidate for admission to the first year of the degree of Bachelor of Science Course shall be required to have passed the Higher secondary examination (Academic or Vocational Stream) conducted by the Government of Tamil Nadu or an Examination accepted by the Syndicate, Subject to such conditions may be prescribed therefore shall be permitted to appear and qualify for B.Sc degree examination in Zoology.

DURATION OF THE COURSE:

The course for the degree of Bachelor of Science shall consist of three academic years divided in to six semesters. Each semester consists of 90 working days.

PASSING MINIMUM:

The candidate shall be declared to have passed the examinations if he /she secures not less than 40 marks.

DISTRIBUTION OF MARKS:

THEORY

University examination = 75 marks

Internal assessment = 25 marks

Internal assessment structure:

Test = 15 marks

Assignments = 05 marks

Attendance = 05 marks

Passing minimum for Internal Assessment = 10 marks

Passing minimum of r University examinations = 30 marks

PRACTICALS

University examinations = 60 marks

Internal Assessment = 40 marks

Internal assessment structure:

Test = 15 marks

Observation record = 10 marks

Regularity in Practical = 15 marks

Passing minimum for internal assessment = 10 marks

Passing minimum for University examinations = 30 marks

CLASSIFICATION OF SUCCESSFUL CANDIDATES:

- Candidates who secure not less than 60 % of the aggregate marks in the whole examinations shall be declared to have passed the examinations in First class.
- Candidates who secure above 50 % and below 60 % shall be declared to have passed the examinations in Second class.
- Other successful candidates who secure below 50% shall be declared to have passed the examination in Third class.

COURSE OF THE STUDY AND SCHEME OF EXAMINATIONS

Sem	Part	Course Code	Course (Subject)	Hours		Credits	Marks			
				Theory	Practical		CIA	EA	Total	
							25	75	100	
I	I		Tamil I	6	---	3	25	75	100	
	II		English I	6	---	3	25	75	100	
	III	17UZO01	Core-I Invertebrata-I	5	----	5	25	75	100	
			Core Practical-I	-----	3	----	--	--	--	
			Allied theory Chemistry/Botany	4	---	3	25	75	100	
			Allied Practical	---	3	--	--	--	--	
	IV		Environ. Studies	1	--	--	--	--	--	
			Value Edu	2	--	2	25	75	100	
II	I		Tamil II	6	--	3	25	75	100	
	II		English II	6	--	3	25	75	100	
	III	17UZO02	Core-II Invertebrata-II	5	--	5	25	75	100	
			17UZOP01	Core practical-I	--	3	3	40	60	100
			Allied theory Botany	4	--	4	25	75	100	
			Allied Practical I	--	3	3	40	60	100	

	IV		Env.Studies	1	--	2	25	75	100
		17UZOSB1	SBEC-1 Sericulture	2	--	2	25	75	100

Sem	Part	Course Code	Course (Subject)	Hours		Credits	Marks				
				Theory	Practical		CIA	EA	Total		
III	I		Tamil III	6	--	3	25	75	100		
	II		English III	6	--	3	25	75	100		
	III	17UZO03	Core III Chordata		4	--	5	25	75	100	
					Core Practical III	---	3	--	--	--	--
					Allied Theory Botany/Chemistry	4	--	3	25	75	100
					Allied Practical	--	3	--	--	--	--
	IV	17UZOSB2	SBEC- 2 Aquaculture	2	--	2	25	75	100		
		17UZONM1	NMEC-1 Human health and hygiene	2	--	2	25	75	100		

IV	I		Tamil IV	6	--	3	25	75	100
	II		English IV	6	--	3	25	75	100
	III	17UZO04	Core IV Cell Biology	6	--	5	25	75	100
		17UZOP02	Core practical II	--	3	4	40	60	100
			Allied Theory Botany/Chemistry	4	--	4	25	75	100
			Allied practical-II	--	3	3	40	60	100
	IV	17UZONM2	NMEC-2 Wild life management	2	--	2	25	75	100
V	III	17UZO05	Core V Genetics	5	--	5	25	75	100
		17UZO06	Core VI Animal Physiology	5	-	5	25	75	100
		17UZOEL1	Elective I MLT	5	--	5	25	75	100
		17UZOEL2	Elective II Biostatistics &Com. Appl	5	--	5	25	75	100
		17UZOSB3	SBEC III Biotechnology	2	--	2	25	75	100
		17UZOSB4	SBEC IV Poultry Science	2	--	2	25	75	100

			Poultry Science						
VI	III	17UZO07	Core VII Developmental Biology	5	--	5	25	75	100
		17UZO08	Core VIII Ecology	5	--	5	25	75	100
		17UZO09	Core IX Evolution	5	--	5	25	75	100
		17UZOEL3	Elective III Clinical Nutrition	5	--	5	25	75	100
		17UZOSB5	SBEC-V Vermi Technology	2	--	2	25	75	100
		17UZOSB6	SBEC VI Diary Science	2	--	2	25	75	100
		17UZOP03	Core Practical- III	--	3	4	40	60	100
		17UZOP04	Core practical IV	--	3	4	40	60	100
			Extension activities	--	--	1	--	--	--
TOTAL CREDITS						140			

FIRST SEMESTER
Core Paper I – INVERTEBRATA I
Paper Code: 17UZO01

UNIT I

A brief introduction and nomenclature - Level of Organization and Classification up to order level.

Phylum Protozoa: General characters- Classifications. Type study-Paramecium-Structure, Locomotion, Nutrition and Reproduction.

General Topic: Protozoan Diseases.

UNIT II

Phylum Porifera: General characters- Classification -Type study- Ascon- Cellular structure, Skeleton, Nutrition and Reproduction.

General Topic: Canal System in Sponges

UNIT III

Phylum Coelenterata: General characters- Classification- Type study- Aurelia- Structure and life history.

General Topic: Polymorphism in Coelenterates.

UNIT IV

Phylum Platyhelminthes: General Characters- Classification- Type study- Liver fluke- Structure, Reproduction and Life History.

General Topic: Parasitic adaptation of Helminths.

UNIT V

Phylum Annelida: General characters and Classification - Type study- Earthworm- External morphology, Digestive system and reproduction.

General Topic: Excretion in Annelids.

REFERENCES:

- Agarwal V.K (2000) Invertebrate Zoology- S.Chand Company.
Barnes R.D (1987) Invertebrate Zoology- Saunders College Publications.
Barrington E.J (1981) Invertebrate Structure and Function. ELBS Editions.
Ekambaranatha Iyer (1993) Manual of Zoology Volume I Invertebrata.
Kotpal R.L (2003) Modern text book of Zoology- Rostogi Publications, Meerut.

SECOND SEMESTER
Core Paper II – INVERTEBRATA II
Paper Code: 17UZO02

UNIT I

Phylum Arthropoda I: General characters and Classification-Type Study- Penaeus- External morphology, Appendages, Nervous system and reproduction.

General Topic: Larval form of Crustacea

UNIT II

Phylum Arthropoda II: Type study – Cockroach - External morphology, Digestive system, Nervous and Reproductive system.

General Topic: Mouth parts of Insects- Beneficial Insects.

UNIT III

Phylum Mollusca I: General characters and Classification - Type study- Freshwater mussel - External morphology, Digestive system and Reproductive system.

General Topic: Respiration in molluscs

UNIT IV

Phylum Mollusca II: General characters and Classification - Type study- Sepia - External morphology, Digestive system, Respiratory system and Sense organ.

General Topic: Economic importance of Molluscs

UNIT V

Phylum Echinodermata: General characters and Classification - Type study- Starfish (Asterias rubens) - External morphology, Water vascular system in Star Fish.

General Topic: Larval forms of Echinoderms.

REFERENCES

Agarwal V.K (2000) Invertebrate Zoology- S.Chand Company.

Barnes R.D (1987) Invertebrate Zoology- Saunders College Publications. Barrington E.J (1981) Invertebrate Structure and Function. ELBS Editions. Ekambaranatha Iyer (1993) Manual of Zoology Volume I Invertebrata.

Kotpal R.L (2003) Modern text book of Zoology- Rostogi Publications, Meerut.

Arumugam N (2009) A text book of Invertebrates – Saras Publication.

SEMESTER I & II
PRACTICAL I- INVERTEBRATA
Paper code: 17UZOP01

I. Major Practicals:

Cockroach-Nervous, digestive, Reproductive system
Prawn-Nervous system

II. Minor Practicals:

Prawn –Appendages
Mouth parts –Honey Bee, Mosquito, and Cockroach.

III. Spotters:

a) Classify and giving reactions:

Entamoeba, Paramecium, Leucosolenia, Hyalonema, Aurelia, Obelia, Taenia, Ascaris, Earthworm, Nereis, Cockroach, Prawn, Freshwater mussel, Starfish,.

b) Draw Labelled Sketch:

T.S. of Taenia , T.S .of Fasciola , Ephyra larva , Nauplius larva and Zoea larva.

c) Biological Significance:

Sponge –Gemmule, Spicules, Physalia, Leech, Limulus, Peripatus, Bipinnaria,.

d) Relate structure and function

Taenia –Scolex , Earthworm – Body setae, Nereis – Parapodium, Peneus –Petasma, Star fish – Tube feet.

Submission of Practical record

SECOND SEMESTER
SKILL BASED ELECTIVE COURSE (SBEC) I
SERICULTURE
Paper Code: 17UZOSB1

UNIT I

Types of silk worms – Tasar, Muga, and Eri. Morphology and life cycle of silk worm (*Bombyx mori*).

UNIT II

Mulberry cultivation in India - Selection of land and cultivation of mulberry –Mulberry varieties –Different methods of planting –Organic and in organic manure application .

UNIT III

Disinfection of rearing houses and appliances - Egg transportation and incubation –Egg handling – Hatching –Brushing –Silk worm rearing techniques.

UNIT IV

Pest and diseases of silk worm and preventive measures. Harvesting of cocoon and quality assessment.

UNIT V

Reeling methods – Reeling and Re-reeling –Silk examination , cleaning , lacing , bookmaking and grading of silk .

Field visit to silk worm rearing centre and reeling industry.

REFERENCES:

An Introduction to sericulture (IInd edition) G.Ganga and Sulochana chetty .

RANGASWAMY .G. (1987) .Manual on sericulture FAO, Vol –IV, Agriculture service bulletin ,CSB , Bangalore , India .

DANDAN .S .B. (2004) ,Hand book of new sericulture technologies ,Central Silk Board Bangalore, pp 287.

THIRD SEMESTER
Core paper III - CHORDATA
Paper code: 17UZO03

UNIT I

Introduction - Prochordates - General Characters and classification Type Study: Amphioxus-external characters, digestive, excretory and circulatory systems.

Class: Pisces, General characters and classification – Type Study: Scoliodon-External characters, Digestive, Respiratory, Circulatory and Urinogenital Systems.

General Topic: Migration of fishes.

UNIT II

Class : Amphibia :General characters and classification -Type Study : Frog –External characters, Digestive ,Respiratory, Circulatory, Girdles and Limbs, Urinogenital Systems.

General Topic: Parental care in Amphibians.

UNIT III

Class: Reptelia: General characters and classification - Type study –Calotes- External characters-Digestive, Respiratory, Circulatory and Urinogenital Systems.

General Topic: Identification of Poisonous and Non- Poisonous snakes and Extinct Reptiles.

UNIT IV

Class: Aves- General characters and classification - Type Study-Pigeon- External characters - Digestive, Respiratory, Circulatory and Urinogenital Systems.

General Topic: Flight adaptations in Birds and migration of birds.

UNIT V

Class: Mammalia – General Characters and classification –Type Study- Rabbit –External Characters – Digestive, Respiratory, Circulatory, Excretory and Reproductive systems.

General Topic: Dentition in mammals.

REFERENCES:

- 1) Ekambaranatha Iyer (1993) Manual of Zoology Vol.II, Viswanathan (printers& publishers) Chennai.
- 2) Jordon, E.L & Verma, P.S. (2000) Chordate Zoology, S.Chand & Co, New Delhi.
- 3) Newman H.H., Chordata, McMilan publishers.
- 4) Arumugam N (2009) A text book of Chordates – Saras Publication.

THIRD SEMESTER
SKILL BASED ELECTIVE COURSE (SBEC) II
AQUACULTURE
Paper Code: 17UZOSB2

UNIT I

Definition of aquaculture – Principles of site selection for fish farms, water, soil, types and other parameters.

UNIT II

Types of aquaculture - Monoculture, Poly culture, Integrated farming, Pond culture, Pen and Cage culture, Raft culture, Race way culture, Warm and cold water fish culture .

UNIT III

Criteria for selection of variety – Seed procurement and stocking management. Water quality management.

UNIT IV

Nutritional requirements and formulation of artificial diets. Breeding and culture of fresh water fishes – Catla, Mrigala, Rohu and Tilapia.

UNIT V

Mari culture – Culture of edible oyster, pearl oyster, mussels, clams, sea urchins, sea cucumbers

REFERENCES:

Fish and Fisheries in India, Jhingran, V.G., 1982, Hindustan Publishing Corporation, New Delhi
Principles and practices of Pond Aquaculture, Annan, J.F, R.O. Smitherman and G. Tehebenoglous (Eds), 1983, Oregon State University, U.S.A.

Home Aquarium: aquatic gema and tropical fish, 1970, Makinos Japan Publications .

NON MAJOR-1
HUMAN HEALTH AND HYGIENE
Paper code: 17UZONM1

UNIT I

Introduction to food. Composition and nutritive value of Cereals (Rice, Wheat, Millets, Ragi, Pearl millet). Nutritional deficiency disease – Anaemia, Scurvy

Unit II

Composition and medical value of Ginger, Black pepper and Turmeric. Dental Care and eye care.

Unit III

Communicable diseases – Dengue fever, Malaria, Amoebiasis, Viral fever and AIDS.

Unit IV

Non-communicable diseases – Stroke, Diabetes, Obesity and Cancer.

Unit V

Awareness on Diarrhea, Alcoholism, Smoking, Tobacco chewing, Ulcer and Jaundice.

FOURTH SEMESTER
Core Paper IV CELL BIOLOGY
Paper code - 17UZ04

UNIT I

Introduction – Microscopes (Simple, Compound, Electron, Florescent) Cytological techniques – Fixation – Sectioning and staining.

UNIT II

Plasma membrane: Ultra structure – Chemical composition and functions and modifications of plasma membrane.

Endoplasmic reticulum: Morphology, Ultra structure, chemical composition and functions.

Golgi complex: Ultra structure, chemical composition and functions.

UNIT III

Lysosomes: Ultra structure and polymorphism- chemical composition and functions:
Peroxisomes and glyoxysomes.

Mitochondria: Ultra structure- chemical composition-enzyme systems- functions-Oxidation-Respiratory chain (ETP)- Kreb's cycle, ATP Production and Biogenesis.

UNIT IV

Ribosomes: Ultra structure-types- chemical composition - functions.

Nucleus and Nucleolus: Ultra structure and functions.

Nucleic Acids: DNA –Ultra structure-replication-transcription, RNA-Types-Genetic code and protein synthesis.

UNIT V

Chromosomes: Ultra structure of Chromosomes, Special types of Chromosomes and functions, Cell division- mitosis and meiosis.

Cancer biology - Types of Cancer, Oncogenes, and Treatments.

REFERNCES:

Cell biology. Veer Bala Rastogi, Rastogi Publications.

Cell Biology, Power.

Arumugam N (2009) Cell biology – Saras Publication.

**SEMESTER III & IV
CORE PRACTICAL II
CELL BIOLOGY AND CHORDATA**

Paper Code: 17UZO P02

I. Major Practical

Total Counting of RBC and/WBC.

Study of mitotic division in onion root tips.

II. Minor Practical

Blood Smear Preparation.

Buccal smear preparation.

Human blood grouping

IV. SPOTTERS

A) Classify and giving reasons:

Amphioxus, Balanoglossus, Shark, Hippocampus, Bufo, Hyla, Naja Naja (Cobra), Pigeon, Rabbit

B) Draw and Labeled Sketch:

Frog-Pectoral Girdle, Pelvic girdle and, Fore Limb, Hind Limb, Hyoid apparatus, Quill Feather, Carapace, Plastron and Draco

C) Biological Significance:

Balanoglossus, Petromyzon, Echineis, Narcine, Ichthyophis, Axolotyl larva, Chameleon and Bat

D) Comment on dentition of the following

Skull of Rabbit and Dog

V. SUBMISSION OF PRACTICAL RECORD

NON MAJOR-1I
WILDLIFE MANAGEMENT
Paper code: 17UZONM2

UNIT I

Wildlife management – Definition and Aim – Himalayan mountain system – Peninsular region – Western Ghats.

UNIT II

Wildlife values and benefits – causes of wildlife depletion – Necessary for conservation – Mode of conservation.

UNIT III

Sanctuaries and National parks in India – Wildlife census.

UNIT IV

Indian endangered fauna, Special projects for endangered species (Tiger, Lion and Elephant).

UNIT V

Indian Board of wildlife (IBWL) – Biosphere – Nilgiri, Wildlife Protection act.

REFERENCES:

1. Veer Bala Rastogi and Jayaraj. Animal ecology and distribution of Animals. Kedarnath Ramnath , New Delhi.
2. Saharia V.B. Wildlife in India. Nataraj Publications, Dehradun 2009.
3. Verma P.S. & Agarwal V.K. Environmental Biology, Rastogi Publication, Meerut 2011.
4. Agarwal V.K. Simplified course in B.Sc., Zoology – Ecology and Ethology. 2002.

FIFTH SEMESTER
CORE PAPER V - GENETICS
Paper Code: 17UZO05

UNIT I

Introduction – **Mendalism** – Gene interaction (Complementary genes, Lethal genes and Epitasis).
Multiple alleles - Blood group in man and Coat colour in Rabbit.

UNIT II

Linkage and crossing over –Types, theories and significance – Chromosomal Map.
Sex linked inheritance (Haemophilia, Colour blindness and Drosophila eye colour). Sex limited and sex influenced genes.

UNIT III

Sex determination in man and Drosophila, Chromosomal Theory and Gynandromorphs
Mutations: Types, Chromosomal aberrations, Aneuploidy and Euploidy.

UNIT IV

Inbreeding and out breeding – significance, merits and demerits.
Syndromes (Down syndrome and Turners syndrome, Twins in man).

UNIT V

Human genome project – Pedigree analysis - Gene structure and functions – Genetic Engineering
Recombinant DNA technology.

REFERENCES:

Verma P.S. and Agarwal V. K. . –Concepts of Genetics.

Rastogi V.B. A text book of Genetics, K.Ramnath, Meerut.

Sambamurthy A. – Genetics – Narosa Pub, New Delhi.

Arumugam N (2009) Genetics – Saras Publication.

FIFTH SEMESTER
CORE PAPER VI ANIMAL PHYSIOLOGY
Paper Code –17UZO06

UNIT I

Nutrition – Food types, Vitamins and Minerals.

Enzymes – Classification, Mechanism of Enzyme action, Coenzymes, Digestion in man.

Respiration – Respiratory pigments, transport of O₂ and CO₂ in man and Anaerobiosis.

UNIT II

Circulation - blood composition, origin and conduction of heart beat in man – blood pressure.

Excretion – Excretory products, Classification – structure of the mammalian kidney and urine formation.

UNIT III

Osmoregulation in Fishes, Osmoconformers, Osmoregulators.

Metabolism – Protein metabolism – Deamination and Ornithine cycle, Carbohydrate – Glycogenesis, Glycolysis, Fat – β Oxidation.

UNIT IV

Nervous Coordination - Neuron, - Types – Conduction of nerve impulse - synaptic transmission – Neuro muscular junction - reflex action.

Effectors – Muscles - Types of muscles – ultra structure of skeletal muscle – Chemical composition and Physiology of Muscle contraction – Kymograph, actin and myosin.

UNIT V

Hormones – Endocrine glands Structure and functions : Pituitary, Thyroid, Islets of Langerhans, Adrenal, and Gonadal Hormone in man: Testis and Ovary.

REFERENCES:

Verma P.S. & Tyagi B.S. Animal Physiology, 6th edition. S.Chand & Co.

Agarwal, V.K. Agarwal, R.A.Srivastava A.K. & Kausha Kumar, Animal physiology & Biochemistry, S. Chand & Co.,

Hoar, W.S (1987) General and Comparative physiology, prentice – Hall. M.K.Chandrashekar
– Circadian Rhythms – Madras science foundation, Chennai.

Arumugam N (2009) Animal physiology – Saras Publication.

ELECTIVE I
MEDICAL LABORATORY TECHNIQUES (MLT) I
Paper code – 17UZO EL1

UNIT I

General and personal care in the laboratory.

Laboratory instruments: Autoclave, hot air oven, incubators, water bath, Centrifuge, Refrigerator, Colorimeter, pH meter, Hemoglobinometer.

UNIT II

Preparation and uses of reagents – normal saline - Turkey's fluid, Hayem's fluid, Leishamn's stain Wright stain, Carnoy's fluid and Bovin's fluid - Acetocalamine.

UNIT III

RBC, WBC, Total count and Erythrocyte Sedimentation rate (ESR), platelet count, clotting time, bleeding time.

Blood pressure apparatus, ECG,

UNIT IV

Examination of urine and faeces –microscopic examination of sediments. Methods of bacterial culture. Examination of cerebrospinal fluid, Semen analysis, sperm motility- sperm count and morphology.

UNIT V

Examination of parasites - Malarial parasites, Plasmodium, *Endameba histolytica*, *Ascaris lumbricoids*, *Taenia solium*.

REFERENCES:

Medical Laboratory Technology vol I, II, III –Kanai L. Mukherjee, Tata McGraw Hill Publishing Ltd., New Delhi.

Medical Laboratory Technology – Ramanik Sood – Jaypee Brother's Medical Publishers (P) Ltd., New Delhi.

ELECTIVE II
BIOSTATISTICS AND COMPUTER APPLICATIONS
Paper Code –17UZO EL2

UNIT I

Introduction - Types of Data – primary and secondary – Collection and tabulation of data – diagrammatic and graphical representation – Bar diagram, Pi diagram, Column graph, Histogram.

UNIT II

Mean, Mode and Median, Standard deviation, Standard error and Coefficient of variance.

UNIT III

Simple Correlation, Simple Regression, Chi square test, student's – t- test, ANNOVA.

UNIT IV

Classification of Computers organization, Input devices, Central Processing Unit, output devices, Secondary storage devices, software.

UNIT V

Internet – Types, Applications and uses, WWW, E-Mail, Computer application in biology.

REFERENCES:

Introduction of Biostatistics and Computer Science – Y.I Parkar & M.G Dhanyagude
NiraliPrakashan publishers, Pune.

Biostatistics by K.S. Negi ATIBS publications & distributors, New Delhi.

Bishop O.N. Statistics for Biology. Boston, Hollghtan, Mifflin.

Introduction to Biostatistics by Pranab kumar, S.Chand company Ltd. New Delhi.

SKILL BASED ELECTIVE COURSE (SBEC) III

BIOTECHNOLOGY

Paper Code: 17UZOSB3

UNIT I

Scope of Biotechnology. Biotechnology in India, Methods of Genetic engineering.

UNIT II

Gene cloning, vectors - plasmid, Cosmids, Phage vectors –Lamda.

UNIT III

Enzymes for genetic engineering - Endonucleases – DNA ligases, alkaline phosphates.

UNIT IV

Polymerase Chain Reaction.(PCR), Blotting techniques (Southern)

UNIT V

Application of Biotechnology in Agriculture, Industries, Health.

REFERENCES:

Biotechnology by V. Kumarasan, Saras Publication.

R. C. Dubey (1998). A Text book of Biotechnology, S.Chand& co Ltd New Delhi.

S. Ignachi muthu (1995).Basic Biotechnology. Tata McGraw Hill publishing co Ltd, New Delhi.

Animal Biotechnology by Dr. Ramadas.

Animal Biotechnology by Ranga.

Arumugam N (2009) Biotechnology – Saras Publication.

SKILL BASED ELECTIVE COURSE (SBEC) IV

POULTRY SCIENCE

Paper Code: 17UZOSB4

UNIT I

Introduction to poultry keeping – Poultry Industry in India – Important breeds of Poultry – Desi, – Chittagong and Leghorn.

UNIT II

Construction of poultry house – Types - Layer house and Broiler house

UNIT III

Poultry feeds – Essential nutrients – Ration for Chick and Broiler.

UNIT IV

Hatchery, Nutritional value of egg, Marketing of egg and By products of poultry.

UNIT V

Common diseases of poultry – Raniket, Coccidiosis and Coryza, Vaccination programme.

REFERENCES:

- 1.Modern aspects of commercial Poultry keeping. Gnanamani A.R.
Giri Publication, Madurai.
2. A text book of Animal Husbandry – Banerjee G.C.
Oxford & IBH publishing Co Pvt. Ltd., New Delhi. 8th Edition
3. Poultry keeping in India. Naidu P.M.N. Indian Council of Agricultural Research, New Delhi
4. Poultry production. Singh R.A. New Delhi

**SIXTH SEMESTER
CORE PAPER VII
DEVELOPMENTAL BIOLOGY
Paper Code: 17UZO07**

UNIT I

Spermatogenesis – definition – Development and structure of mammalian sperm.
Oogenesis – definition – Mechanism and significance – Types of eggs and egg membranes.
Fertilization – definition – process and significance.

UNIT II

Parthenogenesis – definition and significance – types of parthenogenesis.
Cleavage- Definition – Patterns –. Morula and Blastulation.
Cleavage in Frog, and Chick

UNIT III

Fate maps – Natural and Artificial Marking in eggs.
Gastrulation Definition and process in Frog and Chick. Exogastrulation.

UNIT IV

Organogenesis – Tubulation, Development of brain and eye in frog. \
Foetal membranes in chick,
Organizer, Placenta in mammals.

UNIT V

Metamorphosis – Definition and Significance. Hormonal control of metamorphosis in amphibians.
Regeneration – Definition, Types of Regeneration, Events in Regeneration, Physiological changes, Wolffian Regeneration

REFERENCES:

- De Beer, G.R. Embryos and Ancestors. Clarendon Press, Oxford.
Verma. P.S and Agarwal, V.K. Chordate Embryology, S.Chand and Co. Ltd., New Delhi (1998).
Bodmer, Modern Embryology, Saunders International student edition, Philadelphia.3rd Edition 1981.
Eli Benjamini et al., (1991) Immunology – A short course – Wiley Publishers, NY.
Arumugam N (2009) A text book of Embryology – Saras Publication.

CORE PAPER VIII – ECOLOGY

Paper code: 17UZO08

UNIT I

Man and the Environment - Limiting factors - Temperature, Light, Soil, Water sources and biological effects.

Biotic factors of the environment - Animal relationship.

UNIT II

Community Ecology: Population - characteristics – Density, Natality, Mortality and age distribution, Age pyramids.

Community - structure, stratification, components, Ecotone and edge effect, Ecological niche, Food chain and Food web.

UNIT III

Ecosystem - Pond as an ecosystem - Energy flow and ecological succession.

Biogeochemical cycle – Carbon, Nitrogen, Phosphorous.

Animal relationship – Neutralism, Symbiosis and Antagonism.

UNIT IV

Habitats - Fresh water, Marine, estuary and Terrestrial.

Environmental Pollutions - Air, Water, Soil and noise pollution, Sources and prevention.

Solid waste management.

UNIT V

Natural resources- renewable and non renewable. Forest resources- Protection – Chipko movement- Aforestation. Wild life management- Biodiversity, Wild life sanctuaries and National Parks.

TEXT BOOKS

1. H.D.Kumar, Modern concepts of Ecology. Vikas Publishing house.
2. E.P. Odum, Fundamentals of Ecology.
3. G.C. Clarke, Elements of Ecology, John Wiley sons, New York
4. Arumugam N (2009) A text book of Ecology – Saras Publication

CORE PAPER IX - EVOLUTION

PAPER CODE: 17UZO09

UNIT I

Introduction - Origin of life – Abiogenesis, Biogenesis, Time of origin, Urey and Miller Experiment.

UNIT II

Evidences from Paleontology - Comparative anatomy, Embryology, Physiology and Biochemical.

Biogeography – Distribution of animals - Continuous and discontinuous distribution.

UNIT III

Lamarckism and Neo Lamarckism, Darwinism and Neo Darwinism. Modern synthetic theory, Salient features and principles.

UNIT IV

Natural selection Theory - Species and Speciation. Isolating mechanism, mutation and genetic drift.

UNIT V

Adaptation and adaptive radiation.

Colouration-mimicry-Darwin's finches.

Polymorphism -types and significance. Convergent - Divergent-parallel, evolution of Man.

REFERENCES:

- 1) Rostogi, V.B. Organic Evolution, Kedernath, Ramnath publishers, Meerut.
- 2) Verma P.S. & Agarval, V.L. concepts of evolution S.Chand & Company.
- 3) Introduction to evolution-Dodson-Evolution: process and product.
- 4) Arumugam N (2009) A text book of Evolution – Saras Publication

ELECTIVE III
CLINICAL NUTRITION
Paper Code- 17UZOEL3

UNIT I

Introduction, Principles of Healthy Nutrition, Therapeutic diet – types and qualities.

UNIT II

Weight Management and Eating Disorders - Obesity and Underweight, causes and dietary management.

Nutrition and Anaemias

UNIT III

Diabetes - Types, Symptoms, Causes and dietary management.

Hypertension and Cardiovascular Diseases, Symptoms and Dietary management.

UNIT IV

Diseases of gastro Intestinal tract- Gastric and duodenal Ulcer, Diarrhea, Constipation and dietary management.

UNIT V

Typhoid, Jaundice, Malaria, dengue, Chikungunya – symptoms and dietary management.

REFERENCES:

Srilakshmi, B. Dietetics, New Age International (P).

Paul. S. Text book of Bionutrition curing diseases through diet. CBS Publications.

SKILL BASED ELECTIVE COURSE (SBEC-V)

VERMITECHNOLOGY

PAPER CODE-17UZOSB5

UNIT I

Earth worm classification – Morphology and anatomy. Biology of *Lampito maritii*.

UNIT II

Vermicomposting materials and their classification –Feeding habits and food for composting worms .

UNIT III

Vermicomposting methods -Small scale and large scale pit methods, heap method, window method etc., Factors affecting vermicomposting such as Temperature, pH, moisture etc.,

UNIT IV

Vermicomposting in Homes, Maintenance of vermicomposting beds. Harvesting the worms. Earth worm predators, parasites and pathogens.

UNIT V

Application of vermicomposting in Agriculture and Horticultural practices. Advantages of vermicomposting.

REFERENCE:

- Edwards C.A and Batear, B. 1996. Biology of Earth worms. Chapman and Hall. London.
Ismail, S.A. 1997. Vermicology- The Biology of Earthworms. Orient Longman. India.
Ranganathan L.S. 2006. Vermibiotechnology from soil health to human health. Agrobios India. Gupta P.K. 2008. Vermicomposting for sustainable agriculture. Agrobios. India.

SKILL BASED ELECTIVE COURSE (SBEC-VI)

DAIRY SCIENCE

PAPER CODE-17UZOSB6

UNIT I

Dairy farming – Definition – Scope – Role of Co-operative societies in milk production and marketing.

UNIT II

Dairy breeds of India and its classification – Exotic cow breeds – Jersey and Red sindhi.
Indian breeds – Kangayam, Buffalo – Murrah.

UNIT III

Common cattle feed and their nutritive value – Balanced ration for cattle.

UNIT IV

Milk – Composition – Nutritive value and Pasteurization of milk.
Milk products – Butter, Ghee, Cheese.

UNIT V

Bacterial diseases – Anthrax, Mastitis, Viral diseases – Foot and mouth disease, Non-contagious disease, Milk fever.

REFERENCES:

1. Ibraheem Kutty C. and Sheeba Khamer, Milk Production and processing.
Daya publishing House, Delhi, 2014.
2. Banerjee G.C. A text book of Animal Husbandry
Oxford & IBH publishing Co Pvt. Ltd., New Delhi. 8th Edition
3. The complete technology book on Dairy and Poultry industries with farming and processing.
National Institute of Industrial Research Board, Delhi. 2012.
4. Hand book of Dairy farming to produce milk with packaging. EIRI

CORE PRACTICAL -III
GENETICS AND ANIMAL PHYSIOLOGY
Paper code 17UZOP03

I Major Practical:

Qualitative analysis of digestive enzymes in cockroach.

Estimation of the rate of O₂ consumption in fish/crab with reference to body weight.

Qualitative analysis of carbohydrates, proteins, and fats.

II Minor Practical:

Qualitative analysis of Ammonia, Urea and Uric acid in the given sample.

Study of human salivary activity in relation to temperature. \

Ciliary activity in fresh water mussels (Q10)

III Spotters

Observation of common mutants of drosophila

Monohybrid and Dihybrid and Test cross (Diagrammatic representation)

Kymograph – simple twitch, Trappe, Fatigue, Tetanus

Sphygmomanometer, pH meter, Colorimeter, Haemometer,

Submission of record.

CORE PRACTICAL IV
DEVELOPMENTAL BIOLOGY, ECOLOGY, EVALUTION, MLT, BIostatISTICS
AND COMPUTER APPLICATIONS

Paper Code 17UZOP04

MAJOR PRACTICALS:

Estimation of dissolved oxygen content in the given water sample (Winkler Method).

Estimation of salinity in given water sample.

Study of Marine/Freshwater Planktons

MINOR PRACTICALS:

Estimation of urine sugar.

Bleeding time.

Clotting time.

Calculation of Mean, median, mode for the given data.

Spotters:

Slides of different developmental stages of chick embryos (24, 48, 72, 96 hrs)

Slides of blastula and gastrula of frog (morula, early gastrula, yolk plug stage, late gastrula)

Placenta of Sheep / Pig/ Rat.

Fossils any two

Description and uses of autoclave, Hot air oven, Incubator, Centrifuge, pH meter, Colori meter.

Computer applications - Hardware of computer, storage device, mouse.

Submission of Field Visit Report.

Submission of Practical Record.

ALLIED ZOOLOGY

FIRST SEMESTER

Allied paper I- INVERTEBATE & CHORDATE ZOOLOGY

Paper code: 17UZOA01

UNIT I

Protozoa: Paramecium-structure and conjugation

Porifera: Leucosolenia- Structure

Coelenterata: Aurelia- Structure and its life history

General Topics: Protozoan Parasites- Plasmodium, Trypanosoma, Entamoeba

UNIT II

Platy helminthes: *Fasciola hepatica*- Structure and life cycle.

Annelida: Leech- Structure and Digestive system.

General Topic: Human Helminth Parasites- Taenia and wuchereria

UNIT III

Arthropoda: Cockroach - External Morphology and digestive system.

Mouth parts of Honey bee and Mosquito.

Mollusca: Fresh water mussel - External characters and Digestive system.

Echinodermata: Starfish –External characters.

General Topic: Water vascular system in Star fish.

UNIT IV

Chordata - Cephalochordata: Amphioxus - External characters and digestive system.

Pisces: Shark - External characters and digestive system .

Amphibia: Frog - External characters and respiratory system.

Reptilia: Calotes - external characters and urinogenetal system .

General topic: Parental care in Amphibia .

UNIT V

Aves: Pigeon- External characters and respiratory system.

Mammalia: Rabbit – External characters and digestive system . General

topic: Flight adaptation s of birds.

**SECOND SEMESTER
ALLIED ZOOLOGY
Allied paper II
Paper code: 17UZOA02**

UNIT I

Cell Biology: Structure of Animal cell -Structure and functions of Plasma membrane and Mitochondria .

Genetics: Mendelian laws of inheritance.

UNIT II

Developmental Biology: Types of eggs ,Cleavage Blastulation and Gastrulation in frog .

UNIT III

Physiology: Digestion and Excretion in man.

UNIT IV

Ecology: Pond as an Ecosystem, Animal association, Pollution (Air, Water & Noise.)

UNIT V

Evolution: Lamarckism and Neo - Lamarckism, Darwinism and Neo – Darwinism .

REFERENCES:

Bernice Anandtharaj - Allied Zoology.

ALLIED ZOOLOGY - PRACTICAL I
Paper Code: 17UZOAP01

MAJOR PRACTICALS

Cockroach –Digestive, Nervous and Reproductive systems.

MINOR PRACTICALS:

Mouth parts of Honey Bee.

Mouth parts of Mosquito.

SPOTTERS

Amoeba , Paramecium, Aurelia, Fasciola hepatica, Ephyra larva, Taenia Solium, Taenia Scolex,
Fasciola-C.S, Ascaris - male and female.

Sea anemone Hermit crab, Star fish, Redia, Cercaria, Nauplius and Mysis larva.

Amphioxus, Shark, Cobra, Pigeon, Blastula of frog, 24hours Chick embryo.

Submission of Practical Record.

**B.SC. DEGREE EXAMINATION
FOURTH SEMESTER, OCTOBER-2017
ZOOLOGY
Cell Biology (17UZO04)**

Time: 3 hrs

Maximum: 75 marks

Section-A (10x2=20)

Answer all questions

1. Active transport
2. Sarcoplasmic reticulum
3. Peroxisomes
4. Oxidative phosphorylation
5. Genetic codes
6. Satellite
7. Malignant tumour
8. Cell cycle
9. Microtomes
10. Cell fractionation

Section-B (5x5=25 marks)

Answer all questions

11. (a) Give an account on the types of Endoplasmic reticulum.
(Or)
(b) Discuss the various functions of Golgi complex in the cells.
12. (a) Explain the structure of Mitochondria with a note on their function.
(Or)
(b) Give a detailed account of polymorphism in lysosomes.
12. (a) Describe the ultra structure of Nucleus.
(Or)
(b) Describe the Watson and Crick's structural model of DNA.
14. (a) Explain the structure and functions of chromosomes.
(Or)
(b) Briefly explain the events occur during mitosis.
15. (a) Briefly explain the fixation technique.
(or)
(b) Give an account on tissue culture.

**Section-C (3x10=30 marks)
Answer any THREE questions**

16. Describe the Ultra structure and functions of plasma membrane,
17. Describe the ultra structure and functions of lysosomes.
18. Describe the role of ribosomes in protein synthesis,
19. Describe in detail the giant chromosomes.
20. Describe the different types of electrophoresis and their applications.

B.SC., DEGREE PRACTICAL EXAMINATIONS, MARCH - 2018

B.SC., ZOOLOGY, SEMESTER – IV

PRACTICAL - II, CELL BIOLOGY AND CHORDATA

PAPER CODE-17PZOP02

Time: 3 Hrs

Max marks: 60

1. Calculate/Demonstrate the required data with suitable experiment. Write the procedure and comment on your results. (20)
2. Using the given material to make a neat squash/slide preparation. (10)
3. Identify, Draw and comment on A, B, C and D (4x5=20)
4. Practical record (10)

Keys:

1. Total RBC counting
2. Squash preparation of Onion root tip
3. A. Amphioxus
B. Draco
C. Bat
D. Skull of Rabbit