ARULMIGU PALANIANDAVAR ARTS COLLEGE FOR WOMEN
(Autonomous)
(Re-Accredited with 'A' Grade by NAAC)
(A Government Aided College - Affiliated to Mother Teresa Women's University, Kodaikanal)
CHINNAKALAYAMPUTHUR (PO), PALANI -624 615.

PG DEPARTMENT OF ZOOLOGY

SYLLABUS

B.Sc (ZOOLOGY) - 2011-2014

P.G DEPARTMENT OF ZOOLOGY
UG Syllabus 2011-14
SEMESTER - I
PAPER - I INVERTEBRATA I

Sub Code : **Contact hours : 4 / week**
Contact hours :60 / semester

OBJECTIVES:

- To enable the students to understand the classification of animals.
- To acquire the knowledge about invertebrates and their diversity.
- To understand the economic importance of invertebrates.

Unit I: **15hrs**

Taxonomy:

Introduction to Principles of Taxonomy - Protozoa, Metazoa, Radiata, Bilateria, Acoelomata, Pseudocoelomata, Coelomata.

General characters and outline classification up to class level with one example – Protozoa, Porifera, Coelenterata, Platyhelminthes, Nematoda and Annelida.

Unit II: **15hrs**

Protozoa : Type Study - Paramecium

General topic : Protozoan parasites: Plasmodium.

Porifera : Type Study – Ascon sponge - Leucosolenia

Unit III: **10hrs**

Coelenterata : Type study - Obelia colony

General topic : Polymorphism in Coelenterata, Coral reefs

Unit IV : **10hrs**

Helminthes : Type study – Liver fluke – External Morphology –

Digestive, Excretory and reproductive systems and Life history

Type study : Ascaris – Sexual dimorphism, Reproductive system and Life cycle.

Unit V: **10hrs**

Annelida : Type study – Megascolex - Setae, Nephridia,

Nervous and Reproductive system only

General topic : Metamerism in Annelida

Text Book :

A manual of Zoology Volume I Invertebrata.

Ekambaranatha Ayyar, M., Ananthakrishnan, T.N.,

S.Viswanathan (Printers& Publishers) Rt.Ltd. Chennai

Reference Books

1. Invertebrata, Phylum series, Kotpal, R.L. Rostagi Meercut (1990)
2. Jordan : Invertebrate Zoology (S.Chand & co)
3. R.D.Barnes : Invertebtate Zoology (Saunders)
4. Dhami and Dhami : Invertebrate Zoology
5. E.J.W. Barrington : Invertebrata structure and functions (Borton Houghton) (Miffin & ELBS)
6. L.H.Hymer : The Invertebrata Vol I to VI

SEMESTER - I
PAPER –II INVERTEBRATA II

Sub Code : **Contact hours : 4 / Week**
Contact hours : 60 / semester

OBJECTIVES:

- To enable the students to understand the classification of animals.
- To acquire the knowledge about invertebrates and their diversity.
- To understand the economic importance of invertebrates.

Unit I: 10hrs

General characters and outline classification up to class level with following example – Arthropoda, Mollusca and Echinodermata

Unit II: 15hrs

Arthropoda: Type Study – Prawn – external morphology – appendages, digestive, excretory systems, Reproductive systems and development.

Peripatus : Affinities

Unit III: 10hrs

Beneficial Insects: Honey bee and Lac insect

Harmful Insects: Pest of Paddy: Tryporyza

Pest of Coconut: Oryctes rhinoceros

Unit IV : 15hrs

Mollusca: Type Study : Pila – External morphology, Digestive system, Reproductive system and Osphradium only

General Topics: Pearl culture, Economic importance of Oyster

Unit V: 10hrs

Echinodermata: Type study –Star fish - External morphology, Pedicellariae, Water Vascular system only.

General topic: Larval forms in Echinodermata

Text Book :

A manual of Zoology Volume I Invertebrate.

Ekambaranatha Ayyar, M., Ananthakrishnan, T.N.,

S.Viswanathan (Printers& Publishers) Rt.Ltd. Chennai

Reference Books

1.Invertebrata, Phylum series, Kotpal, R.L. Rostagi Meercut (1990)

1. Jordan : Invertebrate Zoology (S.Chand & co)
2. R.D.Barnes : Invertebtate Zoology (Saunders)
3. Dhami and Dhami : Invertebrate Zoology
4. E.J.W. Barrington : Invertebrata structure and functions (Borton Houghton) (Miffin& ELBS)
5. L.H.Hymer : The Invertebrata Vol I to VI

SEMESTER -II

PRACTICAL – I

PAPER - IV

INVERTEBRATA AND CHORDATA

SUBJECT CODE: **CONTACT HOURS: 2/Week**

CONTACT HOURS: 30 /Semester

Dissections:

Cockroach - Digestive system and Nervous system and Reproductive system

Pila - Digestive system (Visual Aid / Virtual Dissection)

Mounting:

Cockroach - Salivary gland

Mosquitoes – Mouth parts

House Fly – Mouth parts

Spotters:

Paramecium entire, Binary fission, conjugation,Gemmules, Obelia colony, Obelia medusa, Ascaris entire, Liver fluke, Cercaria, Neries, Heteronereis, Trochophore larva, Leech, Prawn entire, Zoea, Peripatus, Nautilus , Sepia, Honey bee, star fish – oral and aboral View, Amphioxus, Balanoglossus, Ascidian, Three edible fishes- (Anabas, Saccobranchus, Trichiurus savala), Hippocampus, Bufo, Rhacophorus, Draco, Chameleon, Archaeopteryx, Naja naja, Russels viper, and Bat.

Study Tour:

Zoological study tour is Compulsory

B.Sc., ZOOLOGY ANCILLARY

SEMESTER - I

PAPER I

INVERTEBRATA, CHORDATA, CELL BIOLOGY & GENETICS

Sub Code: **Contact Hours :3 / week**

Contact Hours :45 / semester

Unit – I **15hrs**

Outline classification of animal kingdom – classification of invertebrates with diagnostic characters with one example in each phylum, a) Amoeba b)Sponge c) Obelia d) Liver flukee) Earthworm f) Ascaris g) Prawn h) Pila i) Starfish.

Unit – II **10hrs**

Classification of chordates upto classes with one example in each phylum.

a) Balanoglossus b) Ascidian c) Amphioxus d) Shark e)Frog f) Calotes

g) Pigeon h) Rabbit.

Unit – III: **5hrs**

Type study - Frog: External Morphology, Respiratory system

and Circulatory system.

Unit – IV: **10hrs**

Ultra structure and functions of Plasma membrane, Mitochondria, Golgibody, Endoplasmic reticulum, Ribosomes& Nucleus.

Unit – V: **5hrs**

Laws of Mendel, Sex – linked inheritance in man,

Sex determination in man.

Text books:

N. Arumugam - A Text book of Invertebrates

N. Arumugam - A Text book of Chordates

N. Arumugam - A Text book of Cell biology

Dr.R.P. Meyyan - A Text of Genetics.

B.SC., ZOOLOGY ANCILLARY

SEMESTER - II

PRACTICAL I

Invertebrata, Chordata, Cell biology, Ecology and Embryology

Subject Code : Contact Hours : 2 / week

Contact Hours :30 / semester

Cockroach - Digestive System and Nervous system.

Frog - Arterial System(Visual Aid / Virtual Dissection)

Cockroach - Salivary glands.

Frog - Mounting of brain(Visual Aid / Virtual Dissection)

Spotters -Paramecium

Obelia colony

Obelia medusa

Ascaris entire(Male and female)

Prawn entire

Starfish (Oral and aboral view).

Cell biology: Blood smear of man

Embryology: Frog - Blastula, Gastrula, Yolk plug stage

Ecology: Pond ecosystem (Visit a pond)

SEMESTER II

PAPER III CHORDATA

SUBCODE : **Contact hours : 7 / Week**
Contact hours :105 / semester

Objectives :

- To make the students to appreciate the basic concepts of Chordate diversity.
- To acquire knowledge about various habits and adaptive radiations of vertebrates.

Unit I: **20hrs**

Chordata characteristics : Outline classification upto order level with examples.

Type study : Prochordata: Amphioxus.

General Topics : Affinities of Hemichordata

Agnatha : Petromyzon – salient features only

Type study : Shark

General topics : Migration of Fishes

Unit II: **20hrs**

Type study:Dipnoi - Distribution and affinities

General Topics : Classification of Amphibia upto order level

Origin of Amphibia

Parental care in Amphibia

Unit III: **25hrs**

Type study : Calotes – External morphology, Circulatory system,

Nervous system, Pectoral and Pelvic girdles only.

General topics : Mesozoic Reptiles – Adaptive radiation and Extinction

Poisonous and Non- Poisonous snakes,

Identification, Biting mechanism - First aid

Unit IV: **15hrs**

General topics : Flight adaptation in birds

Flightless birds

Fossil bird – Archaeopteryx as connecting link

Unit V: **25hrs**

Type study: Rabbit

General Topics :Maruspials

Dentition in mammals,

Stomach in ruminants

Adaptations of Aquatic mammals

Text Book:

A manual of Zoology Volume I Chordata

Ekambaranatha Ayyar, M., Ananthakrishnan, T.N.,

S.Viswanathan (Printers& Publishers) Rt.Ltd. Chennai

Reference Book:

The Chordates, 2nd Edition, Cambridge University Press, New York

Comparative Anatomy of the Vertebrates, Library of Congress Catelogue.

Vertebrates, Their structure and Life, Library of Congres Catelogue

Life of Vertebrates, J.Z.Young

B.SC., ZOOLOGY ANCILLARY

SEMESTER - II

PAPER- II
PHYSIOLOGY, ECOLOGY, EVOLUTION & EMBRYOLOGY

Sub Code: **Contact Hours :3 / week**

Contact Hours :45 / semester

Unit – I 10hrs

Physiology

Nutrition – Role of enzymes in digestion

Respiration – Transport of respiratory gases

Excretion - Structure of Nephron, Ultrafiltration

Unit – II 10hrs

Ecology

Pond Ecosystem - Visit

Biogeo chemical cycle – N_2 Cycle

Wild life conservation

Unit – III 10hrs

Evolution

Lamarckism and Darwinism.

Speciation - Allopatric & Sympatric

Unit – IV 10hrs

Embryology

Gametogenesis - Spermatogenesis, Oogenesis

Unit - V 5hrs

Development of frog upto gastrulation

Test tube baby

Text Book:

N. Arumugam - Physiology,Ecology,Embryology

N. Arumugam - Evolution

Reference Books :

1. P.S. Verma& Agarwal - Animal physiology
2. P.S. Verma - Concepts of evolution
3. B.I. Balinsky - Developmental biology

SEMESTER - III

PAPER -V

IMMUNOLOGY & MICROBIOLOGY

Subject Code: **Contact hours: 6 / week**

Contact hours: 90 / week

Objectives :

- To enable the students to understand the basic concepts of defense mechanism.
- To expose the students into the field of medicine with powerful preventive, therapeutic and diagnostic tools.

Unit – I **25hrs**

Introduction –Types of Immunity – Innate and acquired immunity, Humoral and Cell mediated immunity.

Lymphoid organs – Primary and Secondary.Cells of the immune system- T cells, B cells, Origin and their role in immune system.

Unit – II **20hrs**

Antigens – types of antigen, chemical nature of antigens. Antibodies – Immunoglobulinstructure, types, functions

Immune response - primary and secondary immune response.

Auto immune diseases - Haemolytic anemia and Myasthenia gravis.

Unit – III **15hrs**

Introduction - scope of microbiology.

Bacteria: Ultra structure and Classification of Bacteria.

Bacterial culture - Batch Culture, Plate culture and differential culture- Culture medium.

Virus - Ultra structure,

Unit – IV **20hrs**

Food microbiology – food spoilage, food poisoning, food preservation.

Dairy microbiology – Pasteurization of milk.

Agricultural and environmental microbiology: role of micro organisms in soil fertility – Rhizobium. Biodegradation of pollutants – Pseudomonas. Biofertilizers – Blue green algae. Bio- pesticides - Bacillus thuringiensis

Unit – V **10hrs**

Medical microbiology : Bacterial diseases : tuberculosis ,

Diphtheria, Syphilis and Gonorrhoea. Viral diseases: AIDS and Hepatitis B

.

Text Book:

N.Arumugam etal – Text book of Immunology and Microbiology, Saras Publications.

Reference Books :

1.R.C.Dubey - Immunology

2.Pelazar M.J (1982) - Microbiology McGrawHill Book

Company, New York.

PART III

SEMESTER III

NON MAJOR ELECTIVE - I

SERICULTURE

Sub code : **Contact hours: 2 / week**

Contact hours: 30 / week

Unit I: **6hrs**

Introduction to Sericulture- History and present status of Sericulture

Silkworm morphology, life cycle of Silkworm

Unit II: **6hrs**

Grainage- Reproductive seeds & industrial seeds – Voltinism- Univoltine,Bivoltine,Multivoltine eggs

Unit III: **6hrs**

Rearing- Rearing houses-appliances-Types of brushing and rearing,

rearing of Chawkiworm,Rearing of late age worms-Shelf rearing &

shoot rearing, care during rearing and cleaning.

6hrs

Unit IV:

Optimum feeding and environmental conditions,Selection of ripe worms,spinning,mounting, harvest,storage and transport.

Unit V: **6hrs**

Silkworm diseases.Flacherie,Muscardine,Uzifly attack-Infection,Prevention and control.

Text Book:

1.Comprehensive Sericulture, G.Ganga (2003) Volume - 1 & Volume - 2,

Oxford & IBH Pub.,Co.,Pvt.,Ltd.,

Reference Books:

1.S.Krishnaswamy et al.(1972).Sericulture manual - 1(Mulberry Cultivation), manual - 2 (Silkworm rearing) & manual -2 (Silk reeling).Food and Agriculture Organisation of the United Nations, Rome.

2.Text book of Tropical Sericulture (1975) Japan Overseas Corporation Volunteers 4 - 2, Hiroo,Sibuya Ku,ToKYO,Japan.

3.Sericulture in India,Venkata Narasaiah (2003), Ashish Publishing House New Delhi.

SEMESTER - IV

PAPER VI - GENETICS

SubCode : Contact Hours : 5 / week
Contact Hours : 75 / semester

Objectives :

- To provide basic knowledge about hereditary and environmental variations
- To help the students to appreciate the expressions of Genes.
- To understand the Genetic and Non-Genetic basis of various characters.

Unit –I **10hrs**

Historical background of genetics - vapour and fluid theories, magnetic power theory, preformation theory, epigenic theory, Baer's law, biogenetic law, germplasm theory. Mendel's law of inheritance - Gregor mendel's life, Monohybrid cross and law of segregation, Dihybrid cross and law of independent assortment, back cross and test cross.

Unit – II **25hrs**

Gene interactions - allelic interaction - incomplete dominance, codominance, lethal genes, pleiotropism - non-alleic gene interaction- dominant and recessive epistasis, complementary gene interaction, supplementary gene interaction.

Unit – III **10hrs**

Multiple alleles - A , B , O and Rh blood group, polygenic inheritance -

inheritance of skin color in man.

Unit –IV **20hrs**

Linkage - definition, coupling and repulsion, types of linkage - complete and incomplete linkage in drosophila, crossing over - definition, kinds of crossing over,cytological basis of crossing over in drosophila. sex determination in man and drosophila. sex linked inheritance in man- colour blindness and haemophilia. Extra chromosomal inheritance - kappa particles in paramecium and shell coiling in snail.

Unit – V **10hrs**

Twin studies - Monozygotic and Dizygotic twins.

Syndromes – Down's syndrome, klinefelter's syndrome,Turner's syndrome.

Pedigree chart - Eugenics - positive and negative eugenics,Inbreeding and Outbreeding.

Text Book:

N. Arumugam - Text book of Genetics.

Reference Books:

Mukusick,V.A., 1972 Human Genetics,Prentice Hall India,New Delhi.

Genetics - P.S.Verma & T.K Agarwal.

SEMESTER -IV

PAPER - VII DEVELOPMENTAL BIOLOGY

Subject Code: Contact Hours: 4 /week
Contact Hours: 60/ semester

objectives :

- Embryological processes of different organisms are described.
- Developmental patterns are well explained.
- To appreciate and accept the origin of life and Evolutionary processes.

Unit – I **10hrs**

Basic concepts of Embryology: History of Embryology.

Theories - Preformation, epigenesis, mosaic, regulative and gradient.Von Baer's Law and Biogenetic law.

Gametogenesis:

Spermatogenesis, Oogenesis and types of Sperm and Ovum(Amphixious, frog, chick and Man).

Unit – II **12hrs**

Fertilization:

Types, Mechanism of Fertilization, Theories of Fertilization.

Parthenogenesis - Natural andArtificial parthenogenesis.

Cleavage :

Planes and pattern of Cleavage, Cleavage in frog, Factors influencing cleavage (Yolk).

Unit III **10hrs**

Blastulation : Types of Blastula, Blastulation in Frog

Gastrulation : Fatemap – Morphogenetic movements, Gastrulation in frog.

Unit – IV **15hrs**

Organogenesis:

Formation of primary organ rudiments, Development of heart, eye in frog. Development and significance of foetal

membranes in chick, Placentation in mammals.

Unit – V **13hrs**

Experimental embryology:

Organizer concept - Spemann experiments

Regeneration in salamander limbs, Metamorphosis of Frog

Applied embryology

Test tube baby, Birth control methods.

Reference Books :

1. Balinsky B. - An introduction to Embryology

2. N.J.Berrill - Developmental Biology

3. Verma and Agarwal – Text book of chordate Embryology

4. Arumugam - Text book on Developmental Biology

SEMESTER - IV

PRACTICAL II

PAPER - VIII

IMMUNOLOGY, MICROBIOLOGY, DEVELOPMENTAL BIOLOGY AND GENETICS

Sub Code : **Contact Hours : 3 / week**

Contact Hours : 45 / semester

IMMUNOLOGY

1.Dissection - Chick - Lymphoid Organs

2.Histology of lymphoid organs - Observation and study of prepared micro slides.

A. Bone marrow.

B. Bursa fabricious

C. Thymus.

D. Lymph Node.

E. Spleen.

3.Observation and study of IgG,IgA and IgM.

MICROBIOLOGY

Sterilization of glassware - hanging drop method.
Sterilization of Media.
Preparation of culture media
Identification of gram +ve & -ve bacteria

DEVELOPMENTAL BIOLOGY

Observation and study of prepared micro slide.

Two cell stage

Four cell stage

Blastula

Gastrula

Observation of chick blastoderm

24 hrs

48 hrs

72 hrs

GENETICS

ABO blood group

Syndromes - Down syndrome, Klienfelter’s syndrome, Turner syndrome

Pedigree chart

Shell coiling - snail limnaea

SKILL BASED COURSE - MUSHROOM CULTURE

Sub Code: **Contact Hours :2 / week**

Contact Hours :30 / semester

Objectives:

Edible mushrooms are rich source of proteins. Simple cultivation methods which can be practiced even at home if the students are interested they can be entrepreneurs.

Unit I: **15hrs**

Mushroom culture. Edible mushrooms. General introduction - Advantages of mushrooms - Morphology of edible mushrooms. Nutritive and medicinal values.

Unit II: **15hrs**

Culture methods - Spawn making - Substrate - Bed method, Polythene bag method, Storage of mushrooms - Recipes of mushrooms - Briyani, Cutlet etc.

Reference books:

Mushroom culture - A.K.Krishnamoorthi, T.Marimuthu and S.Nakeeran (2008) Tamilnadu Agricultural University, Coimbatore.

SEMESTER -V

PAPER - IX

BIOLOGICAL CHEMISTRY

Sub Code: **Contact Hours : 6 / week**

Contact Hours : 90 / semester

Objectives :

- To know the chemical basis of biological phenomena.
- To enable the students to understand the metabolic cycles.
- To learn about the regulation of body functions.

Unit – I **20hrs**

Carbohydrates and Carbohydrate metabolism

Structure,outline classification and Biological importance.

Glycolysis, Kreb's cycle.

Unit – II **15hrs**

Aminoacids :Structure, Properties, Classification

Proteins : Structure, Properties and classification and Biological importance.

Unit – III **20hrs**

Lipid and Lipid metabolism

Structure, properties, classification and biological importance

ß - Oxidation of fatty acid.

Unit – IV **15hrs**

Hormones – Classification, Protein and steroid hormones, Mechanism of protein hormone action.

Unit – V **20hrs**

Enzymes and Vitamins

Classification, Mechanism of enzyme action, Factors affecting enzyme activity. Coenzymes and Isoenzymes,

Vitamins - Classification and structure.

Text Book :

1. N. Arumugam et al., Text book of Biochemistry, Saras publications.

Reference Books :

1. Lehninger, Nelsons & co – Principles of Biochemistry
2. Lubert stryer - Bio chemistry
3. Bell, Davidson & Scarborough – Text book of Physiology and biochemistry.
4. Jeyaraman, J.J., 1981. - Laboratory manual of Biochemistry.

SEMESTER V

Paper - X

CELL& MOLECULAR BIOLOGY

Sub Code : **Contact Hours : 6 / week**

Contact Hours :90 / semester

Objectives :

- Provides knowledge about the structural organization of cell.
- The cell organelles provide the importance of structure and march towards the fundamental functional status.
- It gives an insight into the molecular basis of all functions related to the cell.

Unit -I **10hrs**

Discovery of cell & Cell theory, Prokaryotes (E.coli), Eukaryotes (Animal cell). Microscopy: Compound and Electron microscopes.

Unit – II **20hrs**

Ultrastructure and functions – Plasma membrane, Endoplasmic reticulum, Lysosomes, Ribosomes, Golgicomplex, Mitochondria.

Unit –III **20hrs**

Nucleus, Nucleolus and Chromosome.

Cell division –Mitosis & Mitotic apparatus, Meiosis and Synaptonemal complex and significance of cell division.

Unit –IV **20hrs**

Nucleic acids – Structure of DNA (Watson & Crick Model), DNA replication - types (Semiconservative), RNA – types (mRNA, rRNA, & tRNA) and functions.

Unit – V **20hrs**

Mutation – classification, molecular mechanism, biochemical mutation, detection of mutation-clb technique.

Control of gene expression – lac operon

Text book:

1. Arumugam - Cell biology

Reference Books :

1. Ambrose E.J and Dorothy M.E - Cell Biology

2. De Robertis - Cell and molecular biology

SEMESTER - VI

PRACTICAL- III

BIOLOGICAL CHEMISTRY AND CELL & MOLECULAR BIOLOGY

Subject Code: **Contact Hours :3 / week**

Contact Hours :45 / semester

Biochemistry

Enzyme Activity: Effect of temperature on salivary amylase activity Q10 analysis.

Qualitative tests for protein, carbohydrate and lipid.

Amino acid separation using chromatographic method - Paper Chromatography.

Instrumentation – p^H meter, Colori meter, PAGE electrophoresis

Cell & Molecular biology:

Identification of mitotic stages in onion root tip

Identification of meiotic stages in Tredescantia

Preparation of human blood smear

Preparation of giant chromosomes in Chironomus larvae (Demonstration only)

Spotters / slides :

E.coli, Golgi bodies, Endoplasmic Reticulum,Nucleus - Models,

Mitochondria and Chromosome

Watson & Crick model of DNA - Model.

DNA replication - Semi conservative Replication - Model.

ELECTIVE - I

SEMESTER V

NUTRITION AND DIETICS

Sub Code: **Contact Hours :5 / week**

Contact Hours :75 / semester

Unit.I: **15hrs**

Food and its relation to health, Balanced diet,Methods of preparation of food; Boiling, Steaming, Frying - merits and demerits in the preparation of food.

Unit. II: **20hrs**

Definition of nutritional foods, sources and functions of Carbohydrates, Proteins and Lipids.

Vitamins- Water soluble and fat soluble vitamins - sources, functions, requirements and deficiency diseases.

Unit.III: **20hrs**

Water;Fluid of life, nutrient, functions, requirements, dehydration and rehydration. Minerals; role in nutrition, Calcium, Phosphorous, Iron, Sodium and Magnesium.

Unit.IV: **10hrs**

Diet for common deficiency diseases among Indian adolescents - Anaemia, Avitaminosis and Caiceamia.

Unit.V: **10hrs**

Diet chart for human diseases

a.Diabetes, b.Typhoid c.Diarrhoea d.Jaundice e. Hypertension.

Reference Books:

1.Nutrition and Diet therapy - Sue Rodwell, Times Mirror/Mosby College Publishers.

2.Foods (Foods and Principles) - M.Shakuntala Mary and Shadaksharaswamy, New Age International P.LTD, Publishers

SEMESTER – V

PAPER - XII

ELECTIVE II - SERICULTURE

Sub Code : **Contact Hours : 5 / week**

Contact Hours :75 / semester

Unit :1 **15hrs**

Classification of Mulberry. Moriculture, Methods of cultivation, Diseases of mulberry - Bacterial , Viral and Nematode

Unit : 2 **15hrs**

Silkworm biology - Taxonomy, Life Cycle, Anatomy.

Diseases of Bombyx mori (Bacteria, Viral and Fungi),

Pests of Silkworm - Uzifly

Unit : 3 **15hrs**

Seeds / Silkworm eggs. Structure - commercial and reproductive seeds. Voltinism. Hibernating and Non-hibernating eggs, Moth emergence and moth examination.

Artificial hatching methods - Hot Acid treatment, Cold Acid treatment.

Unit : 4 **15hrs**

Rearing: Rearing house and appliances, rearing processes - Chawkiworm rearing - Optimum feeding. Optimum environmental conditions, Care during rearing and cleaning,

Selection of ripe worms, Spinning, Mounting, Harvest, Storage and Transport.

Shoot rearing, Shelf rearing, Floor rearing.

Unit : 5 **15hrs**

Reeling - Stifling, Reeling appliances - Types of croissures, country charka, cottage basin, filature units. Byproducts of Silk reeling.

Text Book:

1. Comprehensive Sericulture, G.Ganga (2003) Volume - 1 & Volume - 2, Oxford & IBH Pub.,Co.,Pvt.,Ltd.,

Reference Books:

1. S.Krishnaswamy et al.(1972).Sericulture manual - 1(Mulberry Cultivation), manual - 2 (Silkworm rearing) & manual -2 (Silk reeling).Food and Agriculture Organisation of the United Nations, Rome.

2.Text book of Tropical Sericulture (1975) Japan Overseas Corporation Volunteers 4 - 2, Hiroo,Sibuya Ku,ToKYO,Japan.

3.Sericulture in India,Venkata Narasaiah (2003), Ashish Publishing House New Delhi.

SEMESTER VI

PAPER -XIII

ANIMAL PHYSIOLOGY

Subject Code: Contact Hours:6 / week

Contact Hours: 90 / semester

Objectives :

- To make the students to understand the fundamentals of physiology.
- To provide the knowledge of mechanism of actions of structural units of all organs.
- To know the communication of all animals with their environment through sense organs.

Unit – I **10hrs**

Historical background

Nutrition, Food, feeding and digestion, Role of enzymes in digestion,

Absorption

Unit – II **20hrs**

Respiration

Types and mechanism, Significance of respiratory pigments,

Transport of respiratory gases, RQ, CirculationStructure & Function of human heart, Haemodynamics

Unit – III **20hrs**

Excretion

Types of nitrogenous wastes, Ammonotelism, ureotelism and uricotelism

Structure and functions of nephron, OsmoregulationOsmosis – types

Osmoregulation in freshwater, marine, estuary and terrestrial animals.

Ionic – regulation and thermoregulation

Unit – IV **20hrs**

Nervous co-ordination:

Structure of neuron, Conduction of nerve impulse, Synapse and

neuromuscular junction, Reflex actionMuscle:Structure, physico- chemical properties, Mechanism of muscle contraction

Unit V **20hrs**

Receptors:

Photoreceptor, Mechanoreceptor, Chemoreceptor and Thermoreceptor.

Endocrine Integration:

Pituitary, thyroid, parathyroid, adrenal and sex glands.

Endocrine control on reproductive cycle – pregnancy – development and function of mammary glands.

Text book:

1. Verma and Agarwal – Animal physiology

Reference Books :

1. Gordon, S.Maleon et. al – Animal function – principles and adaptation.
2. Hoar S.William – General and Comparative physiology

SEMESTER - VI

PAPER -XIV

BIOTECHNOLOGY & BIO INFORMATICS

Sub Code : Contact Hours : 6 / hours

Contact Hours : 90 / semester

Objectives :

- To know the recent trends in biotechnology
- To make the students to understand the integral application of knowledge and techniques.
- To make the students to understand the application of biotechnology in medicine and industry.
- To enable the students to know the biological databases in bioinformatics.

Unit –I **25hrs**

Biotechnology an overview:Scope, trends and current scenario of biotechnology in India, Tools of gene cloning: Restriction endonucleases,DNA ligases, cloning vectors :plasmid, cosmid and expression vector.

Recombinant DNA technology in medicine - human growth hormone, interferon,interlukin, Plasminogen activator.

Unit – II **15hrs**

Animal cell culture – cell culture technique

Monoclonal antibodies – production and applications

Human genome project

Intellectual property right and patent

Unit –III **20hrs**

Transgenesis:

Transgenic techniques – microinjection and electroporation

Embryonic stem cell technology.

Transgenic animals – mice, sheep and fish

Unit – IV **15hrs**

Basics of Bioinformatics: Aims, Tasks and Applications, DNA & Protein Sequencing Analysis: Genomics & Proteomics – Genome Mapping, DNA Sequencing methods, Protein

Sequencing, Gene & Protein Expression Analysis, DNA Micro Arrays, Gene Chip, Protein Expression Analysis.

Unit -V: **15hrs**

Biological Databases, Tools & their Uses : Nucleic Acid Sequencing Data bases – Gene Bank, EMBL, DDBJ & NCBI, Protein Sequence Databases – TrEMBL, PiR & SWISSPROT, Sequence Alignment : Pair wise Alignment – FASTA, BLAST , Multiple Alignment – CLUSTA

Text Book:

1. Basic Bio informatics - S.Ignacimuthu

Reference Books:

1. Introduction to bioinformatics -T.K.Attwood & D.J.Parry - Smith

2. Developing Bioinformatics & Computer Skills – Cynthia Gibas & Per Jamback

SEMESTER – VI

PRACTICAL IV

ANIMAL PHYSIOLOGY , BIOTECHNOLOGY & BIOINFORMATICS

Sub code: **Contact Hours :3 / week**

Contact Hours :45 / semester

Animal Physiology:

1. Estimation of rate of Oxygen consumption in fish.
2. Effect of temperature on ciliary activity of Fresh water mussel. (Demonstration only)
3. Effect of temperature on heartbeat of fresh water mussel. (Demonstration Only)
4. Qualitative detection of excretory products ammonia, Urea and Uric acid

Experimental setup:

1. Kymograph
2. Sphygmomanometer
3. Haemoglobinometer
4. Haemocytometer

Biotechnology: Demonstration only

1. Extraction of DNA.
2. Extraction of RNA
3. Agarose Gel Electrophoresis.

Bioinformatics:

Biological Data Bases:

Nucleic acid sequence Data Bases : NCBI, EMBL

Protein sequence Data Bases : SWISS – PROT, Tr-EMBL

SEMESTER VI

PAPER - XV

ELECTIVE III - BIOSTATISTICS

SUB CODE: **CONTACT HOURS: 5 /week**

CONTACT HOURS: 75 /semester

Objectives :

- To enable the students to understand the data collection and analysis
- To ensure the students to have the knowledge of putting the result into statistical way.

UNIT I: **15hrs**

Introduction to Biostatistics, Frequency distribution, Collection of data, Sampling methods, Diagrammatic and Graphical representation.

Unit II **20hrs**

Measures of central tendency- Mean,Median and Mode.

Measures of dispersion : Standard deviation, Standard error &

Coefficient of variation.

Unit III **10hrs**

Probability- Addition theorem and Multiplication theorem, Binomial distribution, Normal distribution and Poison distribution.

Unit IV: **15hrs**

Chi-square test, Student 't' test.

Unit V: **15hrs**

Correlation - Definition,Types of correlation, Estimation of unknown value from known value.

REFERENCE BOOKS:

1. S.P. Gupta - Statistical Methods

2. Norman T.J.Bailey - Statistical Methods in Biology

3. S.S.Palanisamy& M.Manoharan - Statistical Methods for Biologists

SEMESTER VI

(SBC) ORNAMENTAL FISH CULTURE

SUB CODE :Contact Hours : 2 / week

Contact Hours :30/ semester

Objectives :

- To implement earn while you learn, subjects such as job oriented programmes are the need of the hour.
- Self reliance can be possible for the students by introducing such courses.
- Make the students to enter into the small scale industry with minimum input.

Unit I: 7hrs

Construction of home aquarium: Design and construction of aquarium tank, Accessories used in aquarium tank., Aquarium plants.

Unit II: 6hrs

Taxonomy and biology of popular ornamental fishes: Live bearers (ovo-viviparous)- Guppy and Molly. Egg layers(oviparous)-Gold fish andAngelfish.

Unit III: 5hrs

Nutritional requirements of ornamental fishes- different kinds of feeds(Live food & Artificial food).

Unit IV: 6hrs

Cleaning the aquarium, control of snail and algal growth. Common diseases of aquarium fishes.

Unit V: 6hrs

Commercially important marine ornamental fishes, entrepreneurship development in ornamental fish culture.

References:

1. J.D.Jameson and R. Santhanam. 1996. Manual of ornamental fishes and farming technologies-fisheries college &research institute tanvasu,tuticorin-628008.
2. R.Santhakumar et al.2007. Manual on fresh water ornamental fish culture, dept of fisheries extension, fisheries college and research institute, TANVASU, Tuticorin- 628008.
3. V.k.Venkataramani et al., 2004. Biodiversity and stock assessment of marine ornamental fishes. Dept of fisheries biology&capture fisheries, Fisheries college & Research institute,TANVASU,Tuticorin-628008.

ARULMIGHU PALANIANDAVAR ARTS COLLEGE FOR WOMEN

(AUTONOMOUS)

PALANI

DEPARTMENT OF ZOOLOGY

NON MAJOR ELECTIVE

HUMAN REPRODUCTION AND WOMEN HEALTH

Subject Code:

Contact Hours :2 / week

Contact Hours :30 / semester

Unit -I

Nutrition: **6hrs**

Composition of food and balanced diet.

Vitamins deficiencies

Unit – II **6hrs**

Reproduction:

Male and Female reproductive systems

Secondary sexual characteristics

Pregnancy childbirth and lactationbirth control

Unit – III **6hrs**

Hormones:

Sex hormones

Hormonal control on reproduction - Disorders of hormonal

imbalance.

Adolescence psychology & Menopause

Unit – IV **6hrs**

Sexual diseases:

Causes and preventive measures

AIDS - counselling,

Unit – V **6hrs**

Infertility and IVF:

Infertility, Counselling andTest tube babies

Test tube baby centers in India

Reference Book:

Human physiology by Saratha Subramanium, Chand & co

Human Physiology by Vander