

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

B.Sc. Zoology

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/ III/ IV/ V	Su b N o.	Subject status	Subject Title	Hrs./ week	Cre- dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	17	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	18	Language	English	6	3	25	75	100	30	40
	III	19	Core - 5	CELL AND MOLECULAR BIOLOGY	4	4	25	75	100	30	40
		20	Major Practical – III	CELL AND MOLECULAR BIOLOGY	2	-	50	50	100	20	40
		21	Allied -III	CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY	4	4	25	75	100	30	40
		22	Allied Practical-III	CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY	2	-	50	50	100	20	40
	IV	23	Skilled Based subject-I	(A) HOME AQUARIUM (OR) (B)NUTRITION AND DIETETICS	4	4	25	75	100	30	40
	IV	24	Non-Major Elective-I	(A)BEE KEEPING (OR) (B)CLINICAL BIOLOGY	2	2	25	75	100	30	40
Subtotal					30	20					

Sem.	Pt. I/II/III/IV/V	Sub. No.	Subject status	Subject Title	Hrs. / week	Credits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	25	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	26	Language	English	6	3	25	75	100	30	40
	III	27	Core - 6	GENETICS	4	4	25	75	100	30	40
		28	Major Practical-IV	GENETICS	2	2	50	50	100	20	40
		29	Allied -IV	DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	4	4	25	75	100	30	40
		30	Allied Practical-IV	DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION	2	2	50	50	100	20	40
	IV	31	Skill Based Subject -II	(A) BIOPHYSICS AND BIOINSTRUMENTATION (OR) VERMITECHNOLOGY	4	4	25	75	100	30	40
	IV	32	NON-MAJOR ELECTIVE-II	(A)PUBLIC HEALTH AND HYGIENE (OR) (B) COMMUNITY AND SOCIAL PREVENTIVE MEDICINE	2	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	25					

CELL AND MOLECULAR BIOLOGY

UNIT I

Cell types – prokaryotic & Eukaryotic, Microscopy – detailed study of compound microscope, phase contrast & electron microscopes, Cytological techniques – Fixation & Fixatives – types of stains.

UNIT II

Ultrastructure & functions of the following cell organelles: Plasma membrane, mitochondria. Golgi apparatus, endoplasmic reticulum, ribosomes, lysosomes, centriole.

UNIT III

Nuclear components: Ultrastructure & functions of nucleus, nuclear membrane, nucleolus, chromosomes & their types Lampbrush chromosome and Polytene Chromosome, Cancer cells & Carcinogenesis: Definition, types, causes, properties, treatment, Oncogenesis. Cell Signaling.

UNIT IV

Nucleic acids – DNA: Components of DNA, DNA structure & Replication, Hybridization, DNA finger print, DNA as genetic material. RNA- Types, Protein Synthesis – Lac Operon

UNIT V

Cell Division – Mitosis, Meiosis, & synaptonemal complex, functional unit of gene, Genetic code – codon, anticodon & control of gene expression.

REFERENCE BOOKS:

- Ambrose, E.J & Dorothy, M.E: Cell Biology (ELBS CAMLOT PRESS)
- De Robertis & De Robertis: Cell & Molecular Biology. (W.B. Saunders & co, Philadelphia).
- De Robertis, E.D.P, Nowinski, W.N & Saez, F.A : Cell Biology (W.B. Saunders & co, Philadelphia).
- Dupraw, EJ : Cell & Molecular Biology (Academic Press, New York)
- Dyson, R.D :Essentials of Cell Biology (Allyn & Bacon Inc. Boston).
Giese.A.C: Cell Physiology (W.B. Saunders & co, Philadelphia).
- Gupta P.K. – Cell and Molecular Biology, Rastogi Publication, Meerut.
- Norman.S. Cohn : Elements of Cytology (Freeman Book co, Kamia Nager, New Delhi).
- Swanson, C.P & Webster. B : The Cell (Prentice Hall Inc., Engle Wook Cliffs, New Jersey)
- Verma, P.S. and Agarwal, V.K. Cytology eighth edition S. Chand and Co.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology)/
Semester- III/Ppr.no.20/Core Practical -III**

PRACTICALS

- Mitosis in Onion root tip cells./ Garlic root cells.
- Meiosis in Grasshopper testis – Demonstration only.
- Giant chromosome in Chironomous larva.
- Preparation of a) Squamous epithelium
- Preparation of human blood smear
- Preparation of frog blood smear
- **Spotters:**Models & charts: DNA, t-RNA, Ribosomes, Nucleus, Mitochondria, Golgi apparatus,Endoplasmic reticulum, Protein synthesis.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology)/
Semester-III/ Ppr.no.21/Allied – III**

Cell Biology, Genetics and Biotechnology

OBJECTIVE: To elucidate the structure and functions of the cell organelles; to exemplify the concept of genetics, the principles of inheritance and the role of genes in determining characters; to understand the application of the innovative technology to manipulate living organisms or parts of organisms to make products useful to human.

CELL BIOLOGY

UNIT I Ultra structure and functions of (a) Plasma membrane (b) Mitochondria (c) Nucleus. Chromosomes – Structure, types and functions; Giant Chromosomes (Polytene and Lampbrush Chromosomes)

UNIT II DNA: Structure (Watson and Crick Model), Replication.

RNA: Different types – r RNA – mRNA – tRNA; Protein synthesis.

Cancer cells and carcinogenesis – Definition, Types, Causes, Properties, Diagnosis and Treatment.

GENETICS

UNIT III Simple Mendelian traits in man; Multiple alleles – ABO blood groups in man – problems.

Rh-factor in human – Erythroblastosis foetalis. Multiple gene inheritance.

UNIT IV Sex determination in man; Sex linked inheritance in man – Haemophilia, Colour blindness and Hypertrichosis.

Non disjunction and Syndromes in man – Klinefelter's syndrome, Turner's syndrome and Down's syndrome.

Inborn errors of metabolism in man – Phenylketonuria, Alkaptonuria and Albinism

BIOTECHNOLOGY

UNIT V Definition, scope and importance of Biotechnology, Basic concepts of genetic engineering.

Restriction and modification system – Cloning vectors – (Plasmids, pBR 322, Lambda phage)

Introduction of cloned genes into host cells – Transgenesis – Transgenic animals and its application.

CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY

Mounting of Giant Chromosome in Chironomous larva

Analysis of any two planktons (marine/fresh water)

Study of the following through Charts, Slides and Figures:

Mitochondria, Interphase Nucleus, DNA, tRNA, ABO Blood group.

Colour Blindness, Haemophilia, Klinefelter's syndrome, Down's syndrome.

pBR 322, Lambda Phage, Recombinant DNA.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology) Semester-III/Ppr.no.23/
Skill Based- I (A)**

HOME AQUARIUM

UNIT I

Construction of Home Aquarium.

Materials needed – Wooden and metal frames – Frameless tanks – Sealants and Gum. Design and Construction of Public Freshwater and Marine Aquaria. Aerators and Filters – Hand net and other equipment. Water quality requirements – Temperature control and Lighting.

UNIT II

Setting up aquarium – gravel/pebbles – Plants – Ornamental objects and fishes – Selection of species – Introducing fishes to the aquarium. Nutritional requirements of aquarium fishes. Different kinds of feeds. Culture of food organisms. Preparation of dry feeds. Feeding methods

UNIT III

Species of ornamental fishes – Taxonomy and biology of Gold fish, Guppies, Swordtails, Marine fishes – Angels and Butterfly fishes. Fresh water species – live bearers and egg layers, one example each – Common Community fishes – Freshwater and marine, any two examples each.

UNIT IV

Reproductive biology of gold fish and angel fish – Maturation, Secondary sexual characters, Breeding habits, Spawning, Parental care, Fertilization and Development of eggs. Common diseases of freshwater and marine aquarium fishes – Parasites, Fungal, Bacterial- symptoms – Treatment – Prevention and control.

UNIT V

Fresh water plants – their taxonomy and morphology, any three of aquarium plants – provision of nutrient and optimum environmental condition for their growth. Other Ornamental organisms – Anemones, Lobsters, Shrimps, Octopus, Star fish etc.,

REFERENCE BOOKS:

1. Guide to tropical fish keeping, 1967, Braymer, J.H.P. I Liffe.
2. Tropical Marine aquaria, 1974. Cox, J.F. Hamlyn.
3. Tropical Fish: Setting up and maintaining fresh water and Marine aquaria, 1972. Dussa Octopus Book Ltd.
4. Aquarium systems, 1981. Hawkins, A.S. (Ed.) Academic press.
5. Living Aquarium, 1981. Hunnam, P. Ward Lock.
6. Aquarium Fishes and Plants, 1971, Rataj, K. and R. Zikal – Hamlyn.
7. Ornamental Fish for Garden and Home Aquariums, 1956, R and C.P Home Aquariums.
8. Sea Water Aquariums, 1979. Spotte, S. John Wiley.
9. Collins Guide to Aquarium Fishes and Plants, 1969. Schiotez, A. Collins.
10. Complete Aquarium, 1963. Vogt, D. and H. Wermuth Thames.

NUTRITION AND DIETETICS

OBJECTIVE:

To understand the importance of the various food stuff on one side and to study malnutrition, nutrition related diseases and special diets for persons suffering from diseases on the other.

UNIT I

- Macronutrients and their function – Carbohydrates – Fats – Proteins - Water.
- Micronutrients and their function - Vitamins and Minerals.
- Nutritive value of the foodstuff – Cereals – Pulses – Vegetables – Fruits – Milk – Egg – Meat – Fish.

UNIT II

- Parboiling of rice – process of parboiling and uses of parboiled rice.
- Germination of cereals – process of germination and uses of sprouts & its nutritive value.
- Metabolism of foodstuffs – protein, carbohydrate and lipid.
- Food choice and preparation methods.
- Effect of cooking on protein, carbohydrate and fat content.
- Menu planning and meal pattern – vegetarian and non – vegetarian.

UNIT III

- Role of fibres in nutrition.
- Determination of energy content of food – Bomb calorimeter.
- BMR – Determination of BMR – using direct calorimeter and Benedict Methods, Roth basal metabolic apparatus – Factors affecting BMR.

UNIT IV

- Balanced diet – Nutritional requirements of different age groups – Pre schoolers-schoolers – Adolescents – Pregnant, lactating women and Aged people.
- Nutritional diseases – causes and prevention and dietary management of malnutrition, under nutrition and obesity.
- Common nutritional deficiency diseases in India– Kwashiorkor – Marasmas – Anaemia – Goitre.

UNIT V

- Therapeutic diet and its importance, diet planning.
- Symptoms, causes, prevention and dietary management for diabetes mellitus, ulcer, renal diseases, hepatitis, hypertension, atherosclerosis, gastro-intestinal disorders, constipation.

REFERENCE BOOKS:

1. Ann Louise Gittleman. The Fat Flush Plan. Tata Mc Graw Hill Publishing Company Limited,444/1,Sri Embara Naicker Industrial Estate, Alapakkam,Porur,Chennai
2. Hellen Kowtaluk.Food for Today, Tata Mc Graw Hill Publishing Company Limited,444/1,Sri Embara Naicker Industrial Estate, Alapakkam,Porur,Chennai
3. Shubhangini A. Joshi, Nutrition and Dietetics.T Tata Mc Graw Hill Publishing Company Limited,444/1,Sri Embara Naicker Industrial Estate, Alapakkam,Porur,Chennai.
4. Swaminathan, M. Food Science,Chemistry and Experiment.
5. Swaminathan, M. Principles of Nutrition and Dietetics.
6. You and Your food and its utilization, Manuscript.IGNOU.
7. Rajalakshmi,R.Applied Nutrition.
8. Sumathi, R. Mudambi and M.V. Rajagopal. Fundamentals of Food and Nutrition.
9. Stanley Davidson, Passmore,R.Nutrition and Dietetics
10. Pogy,S.,Stanfield. Nutrition and Diet therapy.
11. Fergos Clydesdate,M.Food Nutrition And Health.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Zoology)
Semester-III/Ppr.no.24(A)/Non-Major Elective - I (A)**

BEE KEEPING

UNIT I

Comparative study of Rock bee, Indian bee, Little bee and Dammer bee – Life history of Apis indica. Queen, Drones and Workers – Identification, Salient features and Functions.

UNIT II

Food of the bee – honey and pollen. Relationship of plants and Bees. Arranging an apiary position – space – direction.

UNIT III

Acquiring bees – Care of newly captured colonies. Different kinds of cells. Swarming.

UNIT IV

Primitive hives – Different types. Advantages and Disadvantages of primitive hives. Newton's bee hive and its architecture. Appliances used in Apiaries.

UNIT V

Honey – Collection and Extraction of honey, preservation, storage, Physical properties, chemical composition, Nutritive value, medicinal values, Honey as Daily Food.

REFERENCES:

1. Bee Keeping in India – Sardar Singh- KAR, Delhi.
2. Bee keeping in South India – Cherian M.C. & Ramachandran, Govt. Press, Chennai.
3. Handbook of bee keeping – Sharma P.L. & Singh S., Chandigarh.
4. Apiculture – J. Johnson and Jeyachandra, Marthandam, Tamil Nadu.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc.Zoology)/
Semester-III/Ppr.no.24(B)/Non-Major Elective - I (B)**

CLINICAL BIOLOGY

UNIT I

Introduction- Normal and Abnormal conditions of body – Symptoms – Samples to be collected for analysis – diagnosis – Instruments used in the analysis - Sterilization .

UNIT-II

Urine Analysis –Collection and preservation of sample and chemical estimation. Protein,Urea,Glycemia sediments and casts,impaired renal function and clearance test.

UNIT-III

Estimation of Gastro intestinal contents –Saliva constituents,Collection and estimation of Gastric juice,Secretion of liver, Duodenal contents and Pancreatic function tests.

UNIT-IV

Clinical Haematology –Ways of obtaining blood, Haemoglobin estimation. Cell counting (DC/ TC),Estimation of Erythrocyte sedimentation test (ESR) ,pathological ,physiological and hereditary disorders, Blood banking ,Blood grouping ,and typing ,Glucose Tolerance Test (GTT) , Impaired Glucose Tolerance Test , Elisa test.

UNIT-V

Fertility test-semen analysis and pregnancy test,RIA test-Agglutination test-Morphological variations –Types-Count and Abnormalities.

REFERENCE BOOKS:-

1. Medical laboratory techniques-R.Sood
2. Text book of preventive medicine-J.E Park,Benansidar Bhalot
3. Introduction of medical laboratory technology-Baker, F.J.Silverton
4. Medical laboratory technology-Lynch.

GENETICS

UNIT I

Introduction to Genetics. Mendel- Reason for Mendel's experiment, Alleles, Backcross, testcross-Mendellian laws of heredity. Monohybrid cross and Dihybrid cross.

Interaction of genes – complementary, supplementary, Duplicate genes, lethal genes in man, epistasis, complete and incomplete dominance, co-dominance.

Multiple alleles – A,B,O blood groups- Rh factors in man Problems related to blood groups - Erythroblastosis foetalis. Multiple genes (polygenic inheritance) skin colour in man.

UNIT II

Linkage – complete, incomplete, crossing over – coupling and repulsion – Mechanism of Meiotic crossing over – chromosomes map; Sex determination in man, Drosophila. Genic Balance Theory. Sex linked Inheritance in man – Haemophilia, colour Blindness, Holandric genes - hypertrichosis- sex limited genes. Non disjunction in man

Extra chromosomal inheritance in paramecium, maternal predetermination in coiling of shell. Animal breeding: – Inbreeding and out breeding, heterosis.

UNIT III

Mutation – types of mutation- gene mutation – genome mutation – mutagens – mode of action of chemical mutagens and ionizing mutagens – detection of mutation by CLB method.

Chromosomal abnormalities – autosomal and sex chromosomes – klinefelters syndrome, Turner's syndrome and Down's syndrome.

UNIT IV

Human genetics – twins. Human chromosome, karyotypes, idiogram, Simple Mendelian traits in man.

Inborn errors of metabolism – phenylketonuria, Alkaptonuria, Albinism, Sickle – Cell anaemia. Improvement of human race – Eugenics, Euthenics, Pedigree Analysis. Genetics Prognosis – genetic counselling – family history – preventive measures.

UNIT V

Bacterial genetics – structure of E-coli, bacterial recombination – transformation conjugation, transduction and sexduction. Genetic application of bacteria, structure and life history of T_4 phage. Genetic application of virus.

REFERENCE BOOKS:

1. Strickberger : Genetics (MacMillan).
2. Farnsworth : Genetics (harper and Row).
3. P.K.Gupta: Genetics (Rastogi Publications)
4. P.S. Verma and Agarwal: Genetics (S.Chand & Co.Ltd.)
5. Altonburg,E: Genetics (Oxford & IBH publishing company)
6. Burns G.W.: The Science of Genetics (Mac Millan)
7. A.C.Pai: Foundations of Genetics (Mc Gaw – Hill)
8. J.A.Serra: Modern Genetics (3 volumes)
9. Sinnot,Dunn and Dobzhansky: Principles of Genetics (McGraw Hill)
10. Gardener: Principles of Genetics.

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology)
Semester-IV/Ppr.no.28/Core Practical -IV

PRACTICALS

1. Breeding Experiment: Chi Square test to be illustrated with beads a) monohybrid and b) dihybrid.
2. Observation of simple Mendelian traits in man – to be recorded.
3. Observation and study of polygenic inheritance of quantitative traits to be interpreted in graphs:-a) height of student b) weight of students / length of shells / length of pods.
4. Blood group to be analyzed in a population with a minimum of 30 students.
5. Spotters: models of genetic significance to be studied E-coli, T_4 phage. Down's syndrome, Klinefelters syndrome, Turner's syndrome, sex linked inheritance (colour blindness, hemophilia, hypertrichosis, and webbed toes).
6. Culture and Observation of *Drosophila* life cycle.

**DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY
AND EVOLUTION**

OBJECTIVES:

To understand the sequential changes from cellular grade of organization to organ grade of organization in the development of multicellular organisms. To study the interaction and the interdependence among environmental factors and living organisms; To understand the functional significance of various organs and organ systems of animals. To discern the evolutionary significance of the animals, origin of species, effects of mutation.

UNIT I

Early development in Man: Structure of sperm and ovum; Fertilization – Cleavage, Morula, Blastocyst, Implantation and gastrulation – Fate map. Placenta in mammals – types and functions. Test tube babies – Twins – Amniocentesis. Nuclear Transplantation in Acetabularia.

UNIT II

Abiotic factors: Biological effects of Temperature and Light; Biotic factors: Symbiosis, Commensalism, Mutualism, Parasitism, Prey-predator Relationship; Adaptations: Desert adaptations. Community: Ecosystem – Structure and dynamics of a pond.

UNIT III

Nutrition: Food constituents – Carbohydrates, Proteins and Fats.

Digestion: Role of enzymes in carbohydrate, protein and fat digestion.

Absorption: Absorption of digested food.

Metabolism: Carbohydrate metabolism: Glycogenesis, Glycogenolysis, Glycolysis.

Respiration: Transport and exchange of oxygen and carbon dioxide. Haemoglobin.

UNIT IV

Excretion: Structure of Nephron – Urine formation – Dialysis Nervous Co-ordination: Structure and types of neurons – Nerve impulse, conduction of nerve impulse through neuron and synapse.

Reproduction: Structure of human testis and ovary, Graafian follicle, Menstrual cycle and its hormonal control.

UNIT V

Theories of Evolution: Darwinism, Mutation theory of De Vries.

Adaptive radiation in birds.

Mimicry and Colouration.

DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL PHYSIOLOGY AND EVOLUTION.

1. Mounting and observation of live sperms of a vertebrate.
2. Estimation of dissolved oxygen in two water sample and discuss the result
3. Qualitative test for glucose, protein and lipid.
4. Effect of temperature on the opercular movement of fish; Calculation of Q_{10} .
5. Museum specimens, slides, models and charts:

Developmental Zoology: Human sperm, Human ovum, Cleavage, Diffuse Placenta, Zonary Placenta, Discoidal placenta, Cotyledonary Placenta (any two)

Ecology: Echinoids and Shark, Hermit crab and Sea anemone, Sacculina, Secchi disc.

Animal Physiology: Intestinal villi, Nephron, Heart of mammal.

Evolution: Ancon sheep.

Allied Practical Examination I for course subjects 1.1 and 2.1 at the end of the Second Semester.

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology) Semester-IV/Ppr.no.31(A)/
Skill Based –II (A)**

BIOPHYSICS AND BIOINSTRUMENTATION

UNIT I

Biophysics – Scope and Method – Atoms – Molecules – Molecular Interactions – Chemical bonds – Primary chemical bonds – Secondary chemical bonds. Principles of Thermodynamics – Laws of Thermodynamics – Enthalpy – Entropy – Living systems and energy changes.

UNIT II

Bioenergetics – Energy and Work – Energy Transformation – ATP – Bioenergetics – Structure of ATP – Formation of ATP – NADP – Structure – NADP / NADPH Redox couple – Mitochondrial bioenergetics – Chloroplast bioenergetics. Membrane Conductivity – Diffusion – Active transport – Osmosis – Electric conductivity

UNIT III : Photobiology – Nature of light and its properties – Absorption and Emission Spectra – action spectrum, Refractive index – Huygen's Principle – Polarized light – Solar radiation – UV – Infrared – De- excitation- Bioluminescence – Fluorescence – Phosphorescence.

UNIT IV: Instrumentation – Microscopy – Principle and application of Electron Microscope. Basic Instruments – Principle and applications of pH meter and Colorimeter. Centrifugation – Principle and Types – Chromatography – Principle – Types – Paper, Ion exchange, HPLC and applications

UNIT V

Labeling Techniques: Isotopes, Radioactivity, Radioactive decay, half – life, autoradiography, biological use of radioactivity, radioactivity Counter – Principle – Types – Geiger Muller – Scintillation Counter. Electrophoresis – Principle – Types – Agarose Gel electrophoresis, Polyacrylamide gel – Sodium Dodecyl Sulphate Polyacrylamide gel – Applications. PCR Technology: Working mechanism of PCR. Gel Doc. – Principle – Working mechanism – Lyophiliser – Principle – Working mechanism – applications.

REFERENCE BOOKS:

1. Saleel Bose: Elements of Biophysics.
2. Casey: Biophysics – Concepts & Mechanism.
3. Vasantha patabhi N. Gautham: (Narosa publishing House) – Biophysics.
4. Jeyaraman, K. : Laboratoy Manual in Biochemistry. New Age International publishers.
5. Kalaichelvan, P.T: A Laboratory Manual, MJP Publishers, 47, Nallathambi Street, Triplicane, Chennai 600 005.
6. Gurumani, N: Research Methodology for Biological Sciences. MJP 47, Nallathambi Street, Triplicane, Chennai 600 005.
7. Palanivelu, P. Analytical Biochemistry and Separation Techniques. A Laboratory Manual for B.SC and M.SC Students. Department of Molecular Biology, M.K. University, Madurai-625 021.
8. L. Veerakumari, Bioinstrumentation MJP Publishers, 47, Nallathambi Street, Triplicane, Chennai 600 00

**MSU/2016-17/UG-Colleges/Part-III (B.Sc. Zoology) Semester-IV/Ppr.no.31(B)/
Skill Based –II (B)**

VERMITECHNOLOGY

UNIT I

Earthworm taxonomy – Morphological and anatomical – Classification of earthworms – Food habits – Digestive system – Excretion – Reproduction and Life cycle – Earthworm as farmer's friend.

UNIT II

Types of earthworm – Exotic and native species – South Indian and North Indian species used in Vermicomposting – Collection and Preservation of earthworms for vermicomposting – Culture techniques of earthworms.

UNIT III

Vermicompost production – Requirements – Different methods of Vermicomposting – Heap method – Pot method and Tray method – changes during Vermicomposting.

UNIT IV

Role of Earthworms in soil fertility – Use of Vermicompost for crop production – Use of earthworms in land improvement and land reclamation – Economics of Vermicompost and vermivash production. Earthworms as animal feed – Medicinal value of earthworm meal – Role of Earthworms in Solid Waste, Sewage and faecal waste management and Vermifilters. Earthworms as bioreactors.

UNIT V

Interaction of earthworms with other organisms – Influence of chemical inputs on earthworm activities – Large scale manufacture of Vermicompost, packaging of vermicompost and its marketing – Financial supporting – Government and NGOs for vermiculture work.

REFERENCE BOOKS:

1. Invertebrate Zoology – Ekambaranatha Ayyar.
2. Earthworm in Agriculture – S.C.Talashikar and Dosani, Agrobios Publications, Near Nasarani Cinema, Jodhpur,342 002.
3. Vermicompost for sustainable Agriculture – P.K. Gupta Agrobios 2nd Edition.
4. Organic Farming for sustainable Agriculture – A.K.Dahama,Agrobios.
5. A Hand book of Organic farming – A.K.Sharma.Agrobios publication.
6. Earthworm ecology – Clive A.Edwards St.Lucie press – CRC Press Washington DC.
7. Biology of Earthworm - Edward and Lofti – Chapman and Hall Publication.
8. Vermicology – Sultan A.Ismail – Orient Longman Press.
9. Vermiculture Biotechnology – U.S.Bhawalkar BERI,PUNE.

**MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Zoology) Semester-IV/Ppr.no.32(A)/
Non-Major Elective – II (A)**

PUBLIC HEALTH AND HYGIENE

UNIT I

Physical, Mental, Social – Positive health – Quality of life Index.

Nutrition and Health – Food hygiene – Food toxicants.

Population explosion in India – Birth control measures.

UNIT II

Environment and health – Water – Sources of water – Uses of water. Water borne diseases – Cholera – Ascariasis. Standards of Housing – Ventilation.

UNIT III

Excreta disposal – Importance – Methods of excreta disposal. Sanitary health measures during fairs and festivals. First aid with reference to accident.

UNIT IV

Communicable disease – Viral diseases – AIDS, Rabies. Bacterial diseases – Tuberculosis, Typhoid. Protozoan diseases – Amoebiasis.

Helminth diseases – Filariasis,

UNIT V

Health situation in India – Health problems – Primary health care in India – PHC – National Programmes – National AIDS control – National Malaria Eradication Programme – National Tuberculosis.

REFERENCE BOOKS:

1. Anderson R. Clifford. Your Guide to Health.
2. Basu, S.C. Preventive and Social Medicine.
3. Goel, S.O.L. Public Health Administration.
4. Harold Shoryock and Hubert O. Swartout. You and Your Health illustrated Dealing with Diseases.
5. Park, K. Park's Text Book of Preventive and Social Medicine. Banarsidas Bhanot Publishers, 1167 Prem Nager, Jabalpur – 482 001.
6. Ramarao, V. First Aid in accidents. Sri Krishna brothers, Thambu Chetty Street, Chennai.
7. Sanitarians Hand Book. Theory and Administrative Practice. Pearles Publications, New Orleans, USA.

COMMUNITY AND SOCIAL PREVENTIVE MEDICINE

UNIT-I

Community and Health Meaning and concept-Biomedical, Ecological, Psychological, Social and holistic. Determinants of health & Indicators of health. Concept of community health, Role of primary health centers.

UNIT-II

Drug Addiction: In India today – incidence among college students – common drugs in vogue – their side effects, control and management of drug addiction. **Alcoholism:** Its effect on various organs like heart, lungs, liver, pancreas, brain and intestine – chronic alcoholism – alcoholic withdrawal syndrome – its control and treatment.

UNIT-III

Sexually transmitted diseases: Gonorrhoea – Syphilis – AIDS – Causative agent, causes – symptoms – diagnosis – treatment and control measures.

UNIT-IV

Child abuse: Definition – causes – effects – Legal measures for eradication.

UNIT-V

Problems of old age: Concept of ageing. Housing and health care of the aged. Problems – Cardiovascular – alimentary – Locomotion and joints – welfare service provided to the aged by the Government.

PRACTICALS:

- Simple staining of bacteria.
- Gram staining of bacteria.
- Visit to primary health centres.
- Health survey report of a rural community.
- Museum specimens, slides, models and charts – *Treponema pallidum*, *Neisseria gonorrhoeae*, AIDS virus, Liver cirrhosis and illustrations related to theory syllabus.

REFERENCE BOOKS:

1. Social Problems in India - Ram Akuja.
2. Social Preventive Medicine – Park & Park.
3. Ageing and Aged - Paul Chowthry.
4. Indian Social Problem – G.R. Madan.