B.Sc. III Year
V - SEMESTER
DSC – I, Paper – V
Physiology and Biochemistry

Periods: 45 Max. Marks: 80

UNIT – I Physiology (15 Periods)

1.1 Digestion

1.1.1 Digestion definition and extra and intracellular digestion.
1.1.2 Digestion of Carbohydrates, Proteins, Lipids and Cellulose.
1.1.3 Absorption and Assimilation of digested food; role of Gastrointestinal hormones in digestion

1.2 Respiration

1.2.1 Definition of Respiration and Respiratory mechanisms – External, Internal and cellular.
1.2.2 Respiratory Pigments; Transport of oxygen, Oxygen dissociation curves. Bohr's effect.
1.2.3 Transport of CO_2 – Chloride shift; Regulation of respiration – nervous and chemical

1.3.1 Circulation

1.3.1 Types of circulation - Open and Closed circulation
1.3.2 Structure of Mammalian Heart, Types of hearts – Neurogenic and Myogenic; Heart function – Conduction and regulation of heart beat.
1.3.3 Regulation of Heart rate – Tachycardia and Bradycardia; Blood Clotting mechanism

1.4. Excretion
1.4.1 Classification of Animals on the basis of excretory products- Ammonotelic, Uricotelic, Ureotelic
1.4.2 Structure and function of Nephron.
1.4.3 Urine formation, Counter current mechanism.

UNIT – II Physiology (15 periods)

2.1. Muscle Contraction
2.1.1 Types of Muscles
2.1.2 Ultra structure of skeletal muscle fibre
2.1.3 Sliding Filament theory, muscle contraction mechanism and energetics.

2.2. Nerve Impulse
2.2.1 Structure of Neuron
2.2.2 Nerve impulse - Resting potential and Action potential and Conduction of Nerve impulse
2.2.3 Synapse, types of synapses and Synaptic transmission.

2.3. Endocrine System
3.3.1 Endocrine glands - Structure, secretions and functions of Pituitary, Thyroid, Parathyroid, Adrenal glands and Pancreas
3.3.2 Hormone action and concept of Secondary messengers
3.3.3 Male and Female Hormones, Hormonal control of Menstrual cycle in humans.

UNIT – III Physiology and Biochemistry (15 periods)

3.1. Homeostasis and Enzymes
3.1.1 Concept of Homeostasis.
3.1.2 Mechanism of Homeostasis.
3.1.3 Osmoregulation - Water and ionic regulation by freshwater, brackish water and marine animals
3.1.4 Enzymes: Definition, Classification, Inhibition and Regulation

3.2. Biomolecules and Metabolism
3.2.1. Carbohydrates: Classification and function of Carbohydrates
3.2.2. Carbohydrate metabolism - Glycolysis, Krebs cycle, , Electron transport and oxidative phosphorylation.
3.2.3 Proteins: Classification of proteins based on functions and Chemical nature
3.2.4 Protein Metabolism - Transamination, Deamination and Urea Cycle
3.2.5 Lipids: Classification of Lipids
3.2.6. Lipid Metabolism - Fatty acid synthesis and Fatty acid oxidation.

Suggested readings

Gerard J. Tortora and Sandra Reynolds Garbowski *Principles of Anatomy and Physiology*, Tenth Ed., John Wiley & Sons
Arthur C. Guyton MD, *A Text Book of Medical Physiology,* Eleventh ed., John E. Hall, Harcourt Asia Ltd.
William F. Ganong, *A Review of Medical Physiology*, 22 ed, McGraw Hill, 2005
Sherwood, Klandrof, Yanc, *Animal Physiology*, Thompson Brooks/Coole, 2005.
Sherwood, Klandrof, Yanc, *Human Physiology*, Thompson Brooks/Coole, 2005.
Knut Scmidt-Nielson, *Animal Physiology*, 5th ed, Cambridge Low Price Edition.
Roger Eckert and Randal, *Animal Physiology*, 4th ed, Freeman Co, New York.
Singh. H.R, Text Book of Animal Physiology and Biochemistry
Nagabhushanam , Comparative Animal Physiology
Veer Bal Rastogi, Text Book of Animal Physiology

B.Sc. III Year PRACTICAL SYLLABUS
V - SEMESTER
DSC – I, Paper – V
Physiology and Biochemistry

Periods: 30 Max. Marks: 25

1. Qualitative tests for identification of carbohydrates, proteins and lipids.
2. Qualitative tests for identification of ammonia, urea and uric acid (Nitrogenous excretory products)
3. Effect of pH and Temperature on salivary amylase activity.
4. Study of permanent histological sections of Mammalian Endocrine glands - pituitary, thyroid, pancreas, adrenal gland.
5. Estimation of Haemoglobin by Sahlis method.
6. Estimation of total protein by Lowry's method.
7. Estimation of unit Oxygen consumption of fish with reference to body weight.

- Laboratory Record work shall be submitted at the time of practical examination

- Computer aided techniques should be adopted as per UGC guide lines.

Suggested manuals

Tortora, G.J. and Derrickson, B.H. (2009). *Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.
Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill
Guyton, A.C. and Hall, J.E. (2011). T*extbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). *Biochemistry*. VI Edition. W.H Freeman and Co.
Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). *Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.
Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper's Illustrated Biochemistry*. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.

B.Sc. III Year PRACTICAL MODEL PAPER
V - SEMESTER
DSC- I, Paper – V
Physiology and Biochemistry

Time:2 Hrs. Max. Marks: 25

1. Identification, labeled diagram and salient features of spots: (04 spots)	8
2. Estimation of …….from Biochemistry	04
3. Identification/Study of……from Physiology	04
4. Qualitative Test	04
5. Certified practical record	03
6. Viva voce	02

B.Sc. III Year
VI – SEMESTER, DSE – I(A)
Paper – VI
Applied Zoology

Periods: 45 Max. Marks: 80

UNIT – I (15 Periods)

1. Aquaculture and Sericulture
1.1 Types of Fisheries; Fresh Water Fish and Prawn culture
1.2 Fresh water fishing gears and crafts; Induced Breeding.
1.3 Hatchery design and Management of fish and prawn; Transportation of fish and prawn seed.
1.4 Preservation, Processing and By-products of fishes.
1.5 Fish Diseases and control measures
1.6 Life cycle of *Bombyx mori*
1.7 Structure of silk gland and secretion of silk
1.8 Silkworm rearing technology.
1.9 Spinning, harvesting and storage of cocoons.
1.10 Silk worm Pests and Diseases: Uzi fly; Protozoan, Viral, Fungal and Bacterial; Control and prevention.
1.11 Prospects of Sericulture in India

UNIT – II (15 Periods)
2. Apiculture and Vermiculture
2.1 Selection of Bee Species for Apiculture.
2.2 Bee Keeping Equipment.
2.3 Methods of Extraction of Honey (Indigenous and Modern).
2.4 Bee Diseases and Enemies.
2.5 Products of Apiculture Industry and its Uses (Honey, Bees Wax).
2.6 Introduction of Vermiculture and Vermicomposting.
2.7 Vermiculture techniques.
2.8 Bedding, Essential parameters for Vermiculture and Management
2.9 Methods of Harvesting (Manual & Mechanical).
2.10 Economic Importance of Vermiculture.

UNIT – III (15 Periods)
3. Poultry Farming & Animal Husbandry

3.1 Classification of Fowls based on their use – Broilers and Commercial layers.
3.2 Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs.
3.3 Poultry diseases - Viral, Bacterial, Fungal, Protozoan
3.4 Management of a modern Poultry Farm, progressive plans to promote Poultry as a Self-Employment venture
3.5 Dairy farm and its management
3.6 Animal Husbandry – Introduction, Preservation of semen, artificial insemination of cattle, Induction of early puberty and synchronization of estrus in cattle

Suggested Readings

1. Prost, P. J. (1962). *Apiculture*. Oxford and IBH, New Delhi.
2. Bisht. D.S., *Apiculture*, ICAR Publication.
3. Singh S., *Beekeeping in India*, Indian council of Agricultural Research, New Delhi.
4. Ullal S.R. and Narasimhanna, M.N. Handbook of Practical Sericulture: CSB,Bangalore
5. Jolly. M. S. Appropriate Sericultural Techniques; Ed., Director, CSR & TI, Mysore.
6. Handbook of Silkworm Rearing: Agriculture and Technical Manual-1, Fuzi Pub. Co.
7. Narasimhanna, M. N. Manual of Silkworm Egg Production;, CSB, Bangalore 1988.
8. Wupang—Chun and Chen Da-Chung, Silkworm Rearing;, Pub. By FAO, Rome 1988.
9. Sengupta, K. A Guide for Bivoltine Sericulture; Director, CSR & TI, Mysore 1989.
10. Krishnaswamy, S. Improved Method of Rearing Young age silkworm;CSB,Bangalore,1986.
11. Jhingran. V.G. Fish and fisheries in India.,
12. Khanna. S.S, An introduction to fishes
13. Santanam, B. *et al,* A manual of freshwater aquaculture,
14. Boyd. C.E. & Tucker.C.S, Pond aquaculture water quality management,
15. Biswas.K.P, Fish and prawn diseases,
16. Hafez, E. S. E. (1962). *Reproduction in Farm Animals*. Lea & Fabiger Publisher
17. Dunham R.A. (2004). *Aquaculture and Fisheries Biotechnology Genetic Approache*s. CABI
18. Pedigo, L.P. (2002). *Entomology and Pest Management*, Prentice Hall.
19. Lee, Earthworm Ecology
20. Stevenson, Biology of Earthworms
21. Ranganathan L.S, Vermicomposting technology- soil health to human health

B.Sc. III Year PRACTICAL SYLLABUS
VI – SEMESTER, DSE – I(A)
Paper – VI
Applied Zoology

Periods: 30 Max. Marks: 25

1. Identification and study of important cultivable and edible fishes - Any five
2. Identification and study of important cultivable and edible crustaceans - Any five
3. Identification different larvae of silk worm- Using specimens / pictures
4. Identification of mulberry and non mulberry silkworms
5. Mounting of mouth parts of adult silk worm and silk gland of larva
6. Estimation of quality of milk from different dairy farm units – specific gravity, fat content, pH viscocity.
7. Identification of purity of Honey in different samples
8. Field visits to a Vermiculture / Sericulture / fisheries / apiculture / poultry / dairy farm-submission of any 3 Reports

- Laboratory Record work shall be submitted at the time of practical examination

- Computer aided techniques should be adopted as per UGC guide lines.

B.Sc. III Year PRACTICAL MODEL PAPER
VI – SEMESTER, DSE – I(A)
Paper – VI
Applied Zoology

Time: 2 Hrs. Max. Marks: 25

1. Identification, labeled diagram and salient features of spots: - (05 spots)	10
2. Identification	04
3. Field trip reports (3)	5
4. Certified practical record	04
5. Viva voce	02

B.Sc. III Year
VI - SEMESTER
DSE- I (B) Paper – VI
Entomology

Periods: 45 Max. Marks: 80

UNIT – I: Basics of Entomology (15 Periods)

1.1. Definition, scope and importance of Entomology.
1.2. Insect classification and their distinctive characters.
1.3. Insect External morphology- Head, Thorax, and Abdomen.
1.4. Insect Internal Morphology – Digestive, Respiratory, Circulatory, Excretory, Nervous, and Reproductive systems.
1.5. Insect growth and development.

UNIT – II: Insect vectors and pests. (15 Periods)

2.1. Introduction and history of medical entomology
2.2. Vectors of public health importance – Mosquitoes, Housefly, Sand fly, Lice & Bedbugs
2.3. Vector-borne diseases- (Malaria, Dengue, Filaria) and their control measures.
2.4. Role of pests in Agriculture.
2.5. Crop Pests and their control measures

UNIT – III: Beneficial Insects and Harmful Insects (15 Periods)

3.1. Apiculture.
3.2. Lac culture.
3.3. Sericulture.
3.4. Social life of Insects.
3.5. Venomous Insects.

Practicals:
1. Identification and study of house hold Insects - Cockroach, Silver fish, Crickets
2. Identification and study of important Insect vectors – Mosquitoes, House fly, Head lice.
3. Mounting of mouth parts of mosquitoes.
4. Identification different larvae of silk worm- Using specimens / pictures.
5. Field visits to a Sericulture/ apiculture farm and submission of report.

References

1. Text Book of Applied Entomology Vol. I & II by K. P. Srivastava
2. General Applied Entomology by B V David and T N Anathakrishnan
3. Destructive and Useful Insects by C. L. Metcalf
4. A text book of Entomology by Mathur and Upadhay

B.Sc. III Year
V – SEMESTER
DSE – I (C), Paper - VI
SERICULTURE

Periods: 45 Max. Marks: 80

UNIT – I – Introduction of Sericulture (15 Periods)

1.1 History of Sericulture and Present status of sericulture industry in India.
1.2 Sericulture as Agro-industry - Perspectives and prospects of Sericulture in India.
1.3 Geographical distribution of various species and economic races of silkworms - mulberry, tasar, eri and muga silkworm.
1.4 Types of silkworm host plants and their systematic position.
1.5 Morphology and anatomy of Silk glands

UNIT – II – Biology and diseases of Silkworms (15 Periods)

2.1 Life cycle, External morphology and biology of mulberry silkworm.
2.2 Internal morphology of Silkworm – Digestive, Respiratory, Nervous, Excretory, and Reproductive systems.
2.3 Influence of biotic and a biotic factor on the incidence of diseases.
2.4 Diseases of *Bombyx mor*i and *Philosamia ricini* —Viral, bacterial protozoan and fungal. Preventive and control measures.
2.5 Insect and vertebrate Pests of silkworm and their management.

UNIT – III – Silkworm Rearing (15 Periods)

3.1. Silkworm rearing house and rearing appliances.
3.2. Feeding and Rearing methods of mulberry silk worms.
3.3. Mounting and harvesting of mulberry silk cocoons.
3.4. Properties and composition of silk.
3.5. Commercial characters of cocoons and price fixation.

Practicals:

1. Identification of different types of silkworms.
2. Morphology of egg larva, pupa and adult of different silkworm types.
3. Life history of different silkworm types.
4. Dissection of digestive system and salivary gland of silkworm larva.
6. Dissection of the nervous system of larva silkworm.
7. Rearing appliances
8. Sex differentiation of Larva, Pupa and Adult silkworms
9. Calculation of Shell Ratio.

References:

1. Handbook of Practical Sericulture : Ullal, S.R. and Narasimhanna, M.N. (1987), Central Silk Board Publication, Bangalore.
2. FAO Manuals on Sericulture : Anonymous (1972), Vol. I-IV
3. Sericulture for Rural Development : Hanumappa (1978), Himalaya Publication,
4. The Silkworm, an Important Laboratory Tool : Tazima, Y. (1978), Kodansha Publications, Tokyo.

5. Control of Silkworm Reproduction, Development and Sex : Strunnikov, V.A. (1983), MIR Publications, Moscow.
6. Ericulture in India Sarkar, D.C. (1988), CSB, Bangalore.
7. Silkworm Rearing : Wupang—Chun and Chen Da-Chung (1988), Pub. By FAO.
8. Handbook of Silkworm Rearing : Anonymous (1972), Agriculture and Technical Manual-1, Fuzi Pub. Co. Ltd., Tokyo, Japan.
9. Improved Method of Rearing Young age silkworm : Krishnaswamy (1986), CSB Publication, Bangalore.

B.Sc. III Year
VI - SEMESTER
Generic Elective- I, Paper – I
Medical Transcription

Periods: 30 Max. Marks: 80

UNIT – I (15 Periods)

Medical terminology Pharmacology and Anatomy of humans

1.1. General medical terms, surgical terms, diseases
1.2. Human body parts, systems and functions
1.3. Medication terminology, treatments, drug reactions, pharmacology legalities, medication handling and doctor's orders.

Medical Theories and Techniques Ethical and Legal Responsibilities Medical Transcription Equipment and Technology

1.4 Diagnostic and therapeutic procedure terms and practices
1.5 Surgical procedure terms and practices
1.6 Lab procedures: patient preparation and blood drawing techniques.

UNIT – II (15 Periods)

Basic Transcription, Medical Grammar and Style, Medical Reports Formatting

2.1 Transcribing audio files into typed format.
2.2 Healthcare Documentation formats
2.3 American Medical Association stylistic standards.

Computer Information Systems, Speech Recognition Editing

2.4 Basics of Microsoft Office software, including Word, PowerPoint, Excel
2.5. Basic formatting practices and e-mail and Internet usage and file organization.
2.6 Speech recognition software to transcribe dictation and taking dictation with background noise.

B.Sc. III Year
V- SEMESTER, DSC - II
Paper – VII
Immunology and Animal Biotechnology

Periods: 45 Max. Marks: 80

UNIT – I Immunology – Basic concepts; antigens and antibodies (15 Periods)

1.1 Basic concepts of immunology.
1.2 Cells of immune system
1.3 Primary and secondary Organs of immune system
1.4 Types of Immunity – Innate and acquired
1.5 Basic properties of antigens
1.6 Structure, function and types of an antibody.
1.7 B and T cell epitopes, haptens, adjuvants.
1.8 Antigen-antibody reactions,
1.9 T-Cell and B-Cell activation
1.10 Monoclonal antibodies and their production

UNIT – II Working of an Immune system; Immune system in health and disease (15 Periods)

2.1 Structure and functions of major histocompatibility complex.
2.2 Basic properties and functions of Cytokines, Interferons and complement proteins
2.3 Humoral and Cell mediated immunity.
2.4 Types of hyper sensitivity.
2.5 Concepts of autoimmunity and immunodeficiency.
2.6 Introduction to Vaccines and types of Vaccines

UNIT – III Animal Biotechnology and Genetically modified organisms (15 Periods)

3.1 Concept and Scope of Animal Biotechnology.
3.2 Cloning vectors - Plasmids, Cosmids, Lambda bacteriophage, YAC
3.3 Cloning- Cloning methods (Cell, Animal and Gene cloning)
3.4 Animal Cell culture - Equipment and materials for animal cell culture; applications of cell culture techniques
3.5 Recombinant DNA technology and its applications
3.6 Transgenesis – Methods of Transgenesis.
3.7 Production of Transgenic animals and Application of Transgenic animals in Biotechnology.
3.8 Stem cells –types and their applications

Suggested Readings

Arthur C. Guyton MD, *A Text Book of Medical Physiology,* Eleventh ed., John E. Hall, Harcourt Asia Ltd.
William F. Ganong, *A Review of Medical Physiology*, 22 ed, McGraw Hill, 2005
Sherwood, Klandrof, Yanc, *Human Physiology*, Thompson Brooks/Coole, 2005.
Knut Scmidt-Nielson, *Animal Physiology*, 5th ed, Cambridge Low Price Edition.
Richard A. Glodsby, Thomas J Kind, Barbara A. Osborne, Janis Kuby, *Immunology,* 5th ed, Freeman and Co. New York

Ivan Roitt, *Immunology*, 4th ed, Johanthan Brostoff, Moshy, London.
Thomas C. Chung, *General Parasitology*, Hardcourt Brace and Co ltd. Asia. New Delhi.
Gerard D. Schmidt and Larry S Roberts, *Foundations of Parasitology*, McGraw Hill
Kindt, T. J., Goldsby, R. A., Osborne, B. A., Kuby, J. (2006). VI Edition. Immunology. W.H. Freeman and Company.
Delves, P. J., Martin, S. J., Burton, D. R., Roitt, I.M. (2006). XI Edition. Roitt's Essential Immunology, Blackwell Publishing.

B.Sc. III Year PRACTICAL SYLLABUS
V- SEMESTER, DSC - II
Paper – VII
Immunology and Animal Biotechnology

Periods: 30 Max. Marks: 25

I. Immunology
1.Identification of Blood groups
2. Histological study of spleen, thymus and lymph nodes (through prepared slides)
3. Enumeration of RBC & WBC from a given blood sample
4. Enumeration of Differential count of WBC from a given blood sample
5. Demonstration of
a. ELISA b. Immunoelectrophoresis
6. Identification of Autoimmune disease through charts.

II. Animal Biotechnology

1. Study the following techniques through photographs / virtual lab
   a. Southern blotting
   b. Western blotting
   c. DNA sequencing (Sanger's method)
   d. DNA finger printing
   e. Identification of Vectors
   f. Identification of Transgenic animals
2. PCR demonstration /virtual lab

- Laboratory Record work shall be submitted at the time of practical examination
- Computer aided techniques should be adopted as per UGC guide lines.

Suggested manuals
Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006). Immunology, VI Edition. W.H. Freeman and Company.
David, M., Jonathan, B., David, R. B. and Ivan R. (2006). Immunology, VII Edition, Mosby, Elsevier Publication.
Abbas, K. Abul and Lechtman H. Andrew (2003.) Cellular and Molecular Immunology. V Edition. Saunders Publication.

B.Sc. III Year PRACTICAL MODEL PAPER
V- SEMESTER, DSC - II
Paper – VII
Immunology and Animal Biotechnology

Time: 2 Hrs. Max. Marks: 25

1. Identification, labeled diagram and salient features of spots: (05 spots)	10
2. Identification/Determination from Immunology	06
3. Identification/Study the technique from Anima Biotechnology	06
4. Demonstration of a technique	06
5. Project Work	05
6. Certified practical record	05
7. Viva voce	02

B.Sc. III Year
VI - SEMESTER
DSE –II(A), Paper – VIII
AQUATIC BIOLOGY

Periods: 45 Max. Marks: 80

UNIT – I Aquatic Biomes (15 periods)

1.1 Brief introduction of the aquatic biomes
1.2 Freshwater ecosystem (lakes, wetlands, streams and rivers),
1.3 Estuaries, intertidal zones,
1.4 Oceanic pelagic zone, marine benthic zone.
1.5 Coral reefs

UNIT – II Fresh Water Biology and Marine Biology (15 periods)

2.1 Lakes: Origin and classification of lakes
2.2 Lake as an Ecosystem, Lake morphometry
2.3 Physico-chemical Characteristics of fresh water bodies: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity: dissolved gases (Oxygen, Carbon dioxide).
2.4 Nutrient Cycles and Lakes- Nitrogen, Sulphur and Phosphorous.
2.5 Streams: Different stages of stream development, Physico-chemical environment, adaptation of hill-stream fishes.
2.6 Salinity and density of sea water; Continental shelf; Adaptation of deep sea organisms; Sea weeds.

UNIT – III Management of Aquatic Resources (15 periods)

3.1 Aquatic pollution - Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills,
3.2 Eutrophication
3.3 Management and conservation
3.4 Water pollution acts of India
3.5 Sewage treatment and water quality assessment - BOD and COD.

B.Sc. III Year PRACTICAL SYLLABUS
VI - SEMESTER
DSE –II(A)Paper – VIII
AQUATIC BIOLOGY

Periods: 30 Max. Marks: 25

PRACTICAL

1. Study of the topography of a lake
2. Physico-Chemical and biological analysis of a lake
   Physico-Chemical analysis of water - O2, CO2, BOD, COD
   Biological– Zooplanktons – Identification and population density of Zooplanktons of a lake
3. Determination of - Turbidity / transparency, Dissolved Oxygen, Free Carbon dioxide, Alkalinity (carbonates & bicarbonates) in water collected from a nearby lake / water body.
4. Instruments used in limnology (secchi disc, van dorn bottle, conductivity meter, Turbidity meter, PONAR grab sampler) and their significance.
5. A Project Report on a visit to a Sewage treatment plant / Marine bio-reserve/Fisheries Institutes.

Suggested Readings

1. Ananthakrishnan : Bioresources Ecology 3rd Edition
2. Goldman – Limnology, 2nd Edition
3. Odum and Barrett – Fundamentals of Ecology, 5th Edition\
4. Pawlowski: Physicochemical Methods for water and Wastewater Treatment, 1st Edition
5. Wetzel: Limnology, 3rd edition
6. Trivedi and Goyal: Chemical and biological methods for water pollution studies
   Welch: Limnology Vols.I-II

B.Sc. III Year
VI - SEMESTER
DSE – II(B), Paper – VIII
Public Health and Hygiene

Periods: 45 Max. Marks: 80

UNIT – I Nutrition, Environment and Health (15 Periods)

1.1 Classification of foods - Carbohydrates, proteins, lipids, vitamins and minerals
1.2 Balanced diet and malnutrition.
1.3 Nutritional deficiencies and disorders- Carbohydrates, proteins, lipids, vitamins and minerals.
1.4 Environment and health Impact assessment: concept, steps and applications.
1.5 Occupational, Industrial, agricultural and urban Health-Exposure at work place, urban areas, industrial workers, farmers and agricultural labourers, Health workers and health disorders and diseases.
1.6 Environmental pollution and associated Health hazards

UNIT-II Communicable and Non-Communicable diseases (15 Periods)

2.1 Causes, Symptoms, Diagnosis, Treatment and Prevention of Communicable diseases - Malaria, Filaria, Measles, Polio, Chicken pox, Rabies, Plague, Leprosy, Tuberculosis and AIDS.
2.2 Causes, Symptoms, Diagnosis, Treatment and Prevention of Non-Communicable diseases - Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.
2.3 Water borne diseases: Cholera, *E. coli* , Hepatitis and Polio; Air borne diseases: Chickenpox, Influenza, Measles and Tuberculosis

UNIT-III Health Education in India (15 periods)

3.1 Health care legislation in India – termination of pregnancy act, Maternity benefit act, Transplantation of human organs act, Child Labour act, Biomedical waste act, ESI act.
3.2 WHO Programmes – Government and Voluntary Organizations and their health services
3.3 First Aid and Health awareness, personal health care record maintenance.

Suggested Readings

1. Park and Park, 1995: Text Book of Preventive and Social Medicine – Banarsidas Bhanot Publ. Jodhpur – India.
2. Public Health at the Crossroads Achievements and Prospects. Robert Beaglehole and Ruth
3. Bonita 2nd Edition Cambridge University Press 3. Maxcy Rosenau Last Public Health &
4. Preventive Medicine, Fourteenth Edition Ed RobertWallace, MD, et al. 4.
5. Epidemiology and Management for Health Care: Sathe, P.V. Sathe, A.P., PopularPrakashan,
6. Mumbai, 1991. 5.
7. International Public Health: Diseases, Programs, Systems, and Policies by
8. MichaelMerson, Robert E Black, Anne J Mills Jones and Bartlett Publishers. 6.

B.Sc. III Year PRACTICAL SYLLABUS
VI - SEMESTER
DSE – II(B) , Paper – VIII
Public Health and Hygiene

Periods: 30 Max. Marks: 25

1. Medical fitness– Determine the following:
   BMI, Blood Pressure, Cholesterol (LDL, HDL) Heamoglobin
   Complete Blood Picture; Complete urine examination
2. Qualitative identification of carbohydrates, Lipids, vitamins, lipids and minerals,
3. Estimation of fat content and tests milk adulteration.
4. Qualitative and quantitative survey methods in public health sciences.
5. Identification of parasitic stages of malaria and filaria through permanent slides
6. Estimation of blood glucose level in a normal and diabetic persons.
7. Project report on Epidemiological survey, different diseases such as
   Malaria; Chicken gunya; AIDS, Diarrhoea
8. Epidemiological survey of a slum area to identify the diseases due to poor sanitation and contaminated drinking water.
9. Visit to a community water purification and treatment plant.
10. Visit to an industry to study occupational health hazard and safety of industrial workers (sugar/milk dairy/textile/cement).
11. Visit to agricultural fields to study occupational health of farmers and agricultural laborers.

- Laboratory Record work shall be submitted at the time of practical examination

- Computer aided techniques should be adopted as per UGC guide lines.

B.Sc. III Year PRACTICAL MODEL PAPER
VI - SEMESTER
DSE – II (B), Paper – VIII
Public Health and Hygiene

Time: 2 Hrs. Max. Marks: 25

1	Epidemiological survey report of a slum area health status	10
2	Estimation of ----- from food or water or milk	10
3	Project work	10
4	Certified practical record	05
5	Viva voce	05

B.Sc. III Year
VI - SEMESTER
DSE – II (C), Paper – VIII
Poultry Science

Periods: 45 Max. Marks: 80

Unit -I: Poultry Nutrition and Physiology 15 hours

1.1 Essential amino acids, proteins, fatty acids, vitamins and minerals their inter-relationships.
1.2 Functional regulation of digestion, absorption and metabolism of nutrients.
1.3 Feed formulation for different species and groups
1.4 Different systems of feeding wet mash, dry mash, crumble and pellet feeding. Feed Passage rate in G.I. tract in relation to digestion and absorption efficiency;
1.5 Characteristics features of endocrine glands. Endocrine control and variable factors influencing growth process

Unit II: Poultry Products technology 15 hours

2.1 Structure, chemical composition and nutritive value of egg.
2.2 Various measures of egg quality. Shell, albumen and yolk quality assessment.
2.3 Factors influencing egg quality traits. Mechanism of deterioration of egg quality.
2.4 Different methods of preservation of table eggs and their relative merits and demerits.
2.5 Physical, chemicals, microbial and organoleptic evaluation of meat quality

Unit III: Poultry Health Management 15 hours

3.1 Common diseases of poultry – bacterial, viral, fungal, protozoan, parasitic and other emerging diseases of poultry, their prevention, control and treatment.
3.2 Metabolic and nutrient deficiency diseases and disorders.
3.3 Vaccination programmes and Deworming programmes.
3.4 Control of coccidiosis, worms, ectoparasites and flies. Medication procedures.
3.5 Cleaning and disinfection of poultry houses. Drinking water sanitation

Practical

1. Estimation of amino acids, proteins and fatty acids in feed
2. Virtual demonstration of endocrine glands and their influence on growth of poultry
3. Estimation of albumen and yolk quantity in eggs
4. Estimation of calcium in egg shell.
5. Estimation of carotenes, cholesterol and peroxides in meat of chicken.

B.Sc. III Year
VI - SEMESTER
Generic Elective – II, Paper - II
CLINICAL SCIENCE

Periods: 30 Max. Marks: 80

UNIT – I HAEMATOLOGY and IMMUNOLOGY (15 Periods)

1.1 Introduction of Haematology; Structure, Composition and functions of blood; Origin of blood cells (RBC, WBC, PLATELETS)
1.2 Blood coagulation and theories of blood coagulation, anticoagulants
1.3 Blood groups and Rh factor; Blood Transfusion and Blood Banking
1.4 Blood associated disorders – Anaemia, Leucopaenia, Leucocytosis, Leukaemia and Haemophilia
1.5 Types of Immunity – Innate and Acquired; Antigens and Antibodies
1.6 Immunologlobulins – Classifications and significance; Complement system.
1.7 Lymphatic system and Lymphoid organs – Spleen, Thymus, Lymph nodes.
1.8 T-cells, B-cells and Macrophages.
1.9 Immune response – Humoral and cell mediated; Hypersensitivity – Different types.

UNIT – II TECHNIQUES, PATHOLOGY AND DISEASES (15 Periods)

2.1 Microscopy – Light, phase contrast and Electron Microscopy
2.2 Microtomy- Fixation, Section cutting and Staining procedures
2.3 Biopsy and Autopsy of normal and affected tissues
2.4 Histopathological manifestations in tissues.
2.5 Principles of Sterilization, Autoclave, Microbial plating and Antibiotic Sensitivity Tests.
2.6 Immunological techniques – Agglutinations, precipitation, complement fixation test and ELISA
2.7 Introduction to pathology – Definition, Scope and branches; Health and disease, Types of diseases
2.8 Bacterial diseases (Leprosy, Tuberculosis, Syphilis, Rickettsia and Spirochaete diseases); Viral diseases (Dengue, Hepatitis, Swine flu, Chikun gunya, AIDS).
2.9 Protozoan diseases (Trypanosomiasis, Amoebiasis, Giardiasis, Toxoplasmosis); Helminth diseases (Schistosomiasis, Echinococcosis, Dracunculosis, Ancylostomiasis); Fungal diseases.

REFERENCES:

1. Textbook of Microbiology – R.Anantharayan and CKJ. Paniker
2. A hand book of Medical laboratory technology – V.H. Talib
3. Medical Laboratory technology – (vol-I & vol-II) – Kanai.L. Mukherjee
4. Medical Zoology-Sobti
5. Medical Laboratory Technology-Ramnik Sood
6. Parasitology – Chatterjee
7. Parasilogy – Chakraborty.

B.Sc. ZOOLOGY SYLLABUS UNDER CBCS

B.Sc. III Year
V - SEMESTER
Generic Elective- I, Paper – VI
Vector Biology

Periods: 45

Max. Marks: 80

Unit-I: Vector Biology of Public Health Importance

1.1. Introduction to vectors and vectors of human diseases – Public health nuisance.
1.2. Salient features and Life cycle of important Mosquito vector species – Anopheles, Aedes, Culex and Mansonia.
1.3. Salient features and life cycle of important other Dipteran vectors of public health Importance: Sandflies, Black files, House files and Myiasis causing files.
1.4. Life cycle and public health importance of
-Fleas and lice
1.5. Life cycle and public health importance of
-Ticks and Mites.

Unit – II: Basic sanitation and Public Health

2.1. Basic sanitation – Hygiene and personal protection – Human wastes and Health – Solid waste and Waste water management.
2.2. Distinguishing characters of different species of human malarial parasites Life cycle and host parasite interactions.
2.3. Distinguishing characters of different species of human Filarial parasites Life cycle and host parasite interactions.
2.4. Distinguishing characters of different arboviral diseases and their mode of transmission.
2.5. Control Measures – Source reduction.

B.Sc. ZOOLOGY SYLLABUS UNDER CBCS

B.Sc. III Year
VI - SEMESTER
Generic Elective – II, Paper - VIII
Preventive Medicine

Periods: 30 Max. Marks: 80

Unit-I: Man and Medicine: Towards Health for all (15 hrs)

1.1. Dawn of Scientific Medicine
1.2. Theory of Diseases.
1.3. Definition of health; concepts of health – Biomedical, Ecological, Psychological and Holistic
1.4. Dimensions of Health – Physical, Mental, Social Spiritual, Emotional and Vocational
1.5. Determinants of health – Biological, Behavioural, Environmental, Socio-economic and Health services.

Unit-II: Concept of Health and Diseases (15 hrs)

2.1. Concept of well being – Standard Of Living, Level Of Living & Quality Of Life
2.2. Ecology of health & right to health responsibility for health
2.3. Disease Control/Elimination/Eradication
2.4. Modes of Interventions: Health Promotion, Specific Protection, Early Diagnosis and Treatment, Disability Limitations And Rehabilitations.
2.5. Health Programmes in India – NVBDCP, NLEP, NTP, National AIDS Control Programme, Immunigation programme

Reference

1. Park's Textbook of Preventive and Social Medicine.

Vanita Das

CHAIR PERSON
Board of Studies in Zoology
Osmania University. HYD-7