Tripura University

(A Central University)

Suryamaninagar

West Tripura

Syllabus for

Four Years Undergraduate Programme Subject:

Human Physiology

(As per NEP-2020)

8th Semester (Major)

Revised as on October, 2025

Paper-21 (Theory)
HP-801C
Total Mark = 100 (IA = 40 + ESE = 60) Credit = 04

Unit-I (Medical Microbiology-I)

1. Structure & morphological classification of bacteria, virus & fungi. Structure of bacterial cell wall, difference between bacterial & fungal cell wall, LPS layer, Structure of pili, flagella, spores and cysts; functions
2. Classification of virus, bacteriophage life cycle
3. Bacterial growth curve: different phases, factors affecting growth curve.
4. Significance of different phases of bacterial growth curve.

Unit-II (Medical Microbiology-II)

1. Control of microbial growth: Physical and Chemical methods used in sterilization, disinfection and pasteurization.
2. Etiological agents of gastrointestinal infection, bacterial, helminthic and protozoal infection
3. Bacterial, viral, parasitic and fungal infection of respiratory tract
4. Bacterial, viral, parasitic and fungal infection of central nervous system

Unit-III (Medical Microbiology-III)

1. Food microbiology: Beneficial and harmful microorganisms in food, causative organisms of food-borne infections- mode of transmission and methods of prevention.
2. Bacterial metabolism: Fermentation mechanism
3. Bacterial conjugation, transduction & transformation.
4. Bacterial biofilm, composition and function

Unit-IV (Medical Microbiology-IV)

1. Different types of antibiotics & their mode of action, mechanism of antibiotic resistance.
2. Antiviral drugs and their mode of actions
3. Host parasite interaction: Recognition and entry processes of different pathogens like bacteria, viruses into animal host cells, alteration of host cell behavior by pathogens.
4. Pathophysiology of Some common diseases – Bacterial disease - cholera, Parasitic disease - amebiasis, malaria, Viral disease- HIV.

Paper 22A (Theory)

HP-802C- Environmental Physiology & Public Health Issues

Total Mark = 60 (IA = 24 + ESE = 36) Credit = 02

Unit-I (Environmental Physiology)

1. Different environmental pollutants effecting human health.
2. Air, Water and Noise pollution.
3. Sources and effects of Chlorinated hydrocarbons on human body.
4. Effects of Organophosphorus and Organ carbamates compounds on human system.
5. Heavy metal toxicity - Lead, Arsenic, Chromium, Nickel.
6. Effects of Ionizing and non-ionizing radiations.
7. Global warming, ozone depletion, greenhouse effect, carbon footprint.

Unit-II (Public Health Issues)

1. Basic idea about community & public health issues.
2. Malnutrition in a community, over nutrition and possible remedial measures. Diet management of obese, diabetic, hypertensive individuals and athletes. Iron and iodine deficiency.
3. Population problem - principles and methods of family planning, Problem of infertility and Assisted Reproductive Technologies.
4. PCM - Marasmus, Kwashiorkor, Marasmic Kwashiorkor, endemic goiter, nutritional anemias, rickets, osteomalacia, xeropthalmia, beriberi and their social implications of immunization against diseases.
5. Etiology and prevention of communicable diseases – Malaria, Cholera, Dengue, Hepatitis, HIV.
6. Etiology and prevention of non-communicable diseases - Hypertension, Obesity, Diabetes.

Paper-22B (Practical)

HP- 802C

Total Mark = 40 (IA = 24 + ESE = 16) Credit = 02

CONTENT: Review Writing

Paper-23 (Theory)
HP-803C
Molecular Biological, Cell Biological & Immunological Techniques Total Mark = 100 (IA = 40 + ESE = 60) Credit = 04

Unit-I (Molecular Biological Techniques-I)

1. Electrophoresis - general principle, native and SDS-Polyacrylamide gel electrophoresis.
2. Principles of chromatography- Gel-exclusion, Ion-exchange, affinity chromatography.
3. Spectrophotometry- working principles. Lamda max.

Unit-II (Molecular Biological Techniques-II)

1. Recombinant DNA technology: restriction endonuclease, DNA cloning,
2. cloning vector- plasmid and phage vectors, cloning of DNA into cloning vectors.
3. DNA probe, Colony hybridization, Southern blotting, northern blotting, Western blotting.
4. Principle of Polymerase chain reaction (PCR)

Unit-III (Cell Biological Techniques)

1. Microscopy: Optical microscope and phase contrast microscope- their basic principles. Scanning Electron Microscopy and Transmission Electron Microscopy- their applications in cell biology.
2. Fluorescence microscopy, Advantages of confocal microscopy.
3. Principles applications of Fluorescent Activating Cell Sorting (FACS)
4. Basics about tissue fixatives, embedding and tissue section processing for staining; types of staining.

Unit-IV (Immunological Techniques)

1. Immunoprecipitation,
2. Radio-immunoassay,
3. Enzyme Linked Immunosorbant Assay (ELISA) - direct, indirect.
4. Polyclonal antibody development, Hybridoma technology.

Paper 24A (Theory)
HP-804C
Biostatistics, Research Methodology
Total Mark = 60 (IA = 24 + ESE = 36) Credit = 02

Unit-I (Biostatistics)

1. Principles of statistical analysis of biological data.
2. Basic concepts of variables, population and sampling.
3. Different classes of statistics - mean, media, mode, mean deviation, variance, standard deviation, standard error of mean.
4. Degrees of freedom, probability, normal distribution.
5. Testing of hypothesis – Null hypothesis, errors of inference, level of significance,
6. t-test, Chi-square test, one way ANOVA.
7. Correlation coefficient – linear correlation and linear regression.

Unit-II (Research Methodology & Ethical issues in Biomedical Research)

1. Research methodology: Meaning of research, objectives and significance of research, types of research.
2. Scientific methods in research, selecting a research problem, importance of formulating a research problem, sources of research problems, considerations in selecting a research problem, steps in formulating a research problem, survey and review of literature, the formulation of research objectives.
3. Developing hypothesis and verifying concepts, research design, defining the population & selecting the sample, choice of methods.
4. Need for research design, the concept of sampling, aims in selecting a sample, types of sampling, sample design and its different steps, need for basis of selecting a sampling procedure, characteristics of a good sample design, types of data.
5. Types of research, fundamental or basic research, applied or practical research, Experimental research, Lab experiments and field experiments,
6. Reporting: Preparation & submission of research report.

Paper-24B (Practical)
HP- 804C
Total Mark = 40 (IA = 16 + ESE = 24) Credit = 02

CONTENT: Project Work