

YEAR I: SEMESTER II

DC 3: PAPER 5: Human Physiology – II

1. Excretory system:

- Structure and function of skin.
- Regulation of temperature of the body.
- Structure and functions of kidney in special reference to nephron.
- Physiology of urine formation.

2. Reproductive system:

- Structure and functions of gonads, concept on menstrual cycle.
- Brief idea of pregnancy, parturition, lactation and menopause.
- Brief concept on spermatogenesis and Oogenesis process.

3. Nervous System:

- Concept on sympathetic and parasympathetic nervous system.
- Brief anatomy and functions of cerebrum, cerebellum, hypothalamus and neuron.
- Concept on synapse and synaptic transmission.

4. Endocrine system:

- Structure and functions of pituitary, thyroid and adrenal gland.
- Structure and functions of pancreas.

DC 3: PAPER 6 (Practical)

1. Total count (TC) of RBC, WBC and Platelets.
2. Differential count (DC) of WBC.
3. Erythrocyte Sedimentation Rate (ESR) (Westergren method)
4. Identification with reasons of histological slides (Lung, Liver, Kidney, Small intestine, Stomach, Thyroid, Adrenal, Pancreas, Testis, Ovary and Muscle of mammals).

DC 4: PAPER 7: Physiology of Nutrition

1. Concept and definition of terms;

- Growth, Development, Nutrition, Malnutrition and Health, Scope of Nutrition.

2. Role of Vitamins:

- Fat soluble vitamin-Physiological role, dietary sources and deficiency disorders.
- Water soluble vitamin- Physiological role, dietary sources and deficiency disorders.

3. Role of Minerals (Ca, Fe, Na, K, I, Zn, Mn, Mg, Co):

- Physiological role, dietary sources and deficiency disorders.

4. Principles of meal planning:

- Food exchange list, Factors affecting meal planning and food related behavior.
- Dietary guidelines for Indians.

5. Minimum nutritional requirement and RDA:

- Formulation of RDA, dietary guidelines with reference to man and woman.

6. Energy in human nutrition:

- Energy and its unit, Energy assessment and balance, Factors of energy requirement, BMR and its regulation, SDA of food.

DC 4: PAPER 8 (Practical)

1. Growth chart Plotting and Interpretation using primary or secondary data in accordance with both ICMR and WHO Chart
2. Clinical assessment and sign of nutrient deficiency disorders: Protein energy malnutrition (PEM), Anaemia, Rickets, Goiter, Vitamin A, Vitamin C and Vitamin B-complex (Slide Photography).
3. Diet survey in accordance with ICMR method (at least 3 days).

1. Assessment of Nutritional Status and Surveillance:

- Direct Nutritional status assessment of human groups - Biochemical, Biophysical and anthropometric methods.
- Indirect assessment: Secondary sources of community health data.

2. Concept of Surveillance systems:

- Role of international and national organizations and agencies (WHO, FAO, UNICEF, CARE, NIN, CFTRI, ICMR).

3. Communication in Nutrition and Health Education:

- Type, process and media of communication.
- Interpersonal, Group and Mass communication.
- Importance and relevance of Information, Education and communication (IEC) in Nutrition and Public Health.

4. National Nutritional Intervention Programmes:

- Objective, Target group, Scheme details - Integrated Child Development Services (ICDS), Mid Day Meal Programme (MDMP), Vit A prophylaxis Programme, Anemia prophylaxis programme, Iodine deficiency disorders control programme.
- Concept on public distribution system.

5. Immunization Programme:

- Preliminary concept of immunity-innate, acquired, active and passive immunity.
- Immunization: National Immunization schedule for children and adults, Immunization for foreign travelers.

DC 8: PAPER 16: Practical

1. Anthropometric measurement of Weight for age, height for age, weight for height and its comparison with reference value.
2. Determination of BMI and comments on results.
3. Measurement of circumference of chest, upper arm, waist - hip ratio.
4. Measurements of fat using skin fold thickness.

DC 9: PAPER 17: Epidemiology and Community Nutrition (Theory) (60 Lectures)

1. Concept of population and Community:

- Definition and characteristic features of population.
- Concept of community and community health, types of community.
- Factors affecting health of community – environmental, social, political, cultural and economical.

2. Community water and waste management:

- Source of water, safe drinking water, etiology and effects of toxic agents.
- Microbial examination of water, Water-Potability test (MPN Test).
- Sewage disposal and treatment.

3. Nutritional problems in community:

- Etiology, Clinical signs and management-Kwashiorkor, Marasmus, Goiter and Nutritional anemia.

4. Concept of Disease:

- Endemic, Epidemic, Pandemic, Acute and Chronic, Incubation period and Quarantine period.

- Communicable and Non-communicable diseases, Zoonosis, Epizootic and Enzootic.

5. Principles of Epidemiology:

- Epidemiological study-Descriptive and Analytical
- Factors that Influence the Epidemiology of Disease
- Rate of Disease in a Population-Attack rate, Mortality and Morbidity rate, Prevalence and Incidence of a disease.

DC 9: PAPER 18: Practical

1. Microbiological examination of water (drinking water, supply water & pond water):

- Presumptive test
- Confirmatory test
- Completed test for coliform
- Determination of MPN index.

- Visit to old age home / ICDS Centre / Nutrition Rehabilitation Centre (NRC) / Slum area / Any public place and Report Preparation on nutritional status and health concern (In any area at least 8-10 case studies to be done). **OR** Visit to a Rural Technology Centre/Community Welfare Centre and field report preparation.

DC 10: PAPER 19: Therapeutic Diet – II (Theory) (60 Lectures)

1. Etiology, clinical features and dietary management:

- Weight Imbalances: Underweight, Overweight and Obesity.

2. Eating disorder:

- Concept of Anorexia nervosa and bulimia.

3. Etiology, Risk factor, Sign and Symptom, Diagnosis and dietary management:

- Diabetes mellitus, Diabetes insipidus and Cancer

4. Etiology, Risk factor, Sign and Symptom, Diagnosis and dietary management:

- Hypertension
- Renal diseases (Nephritis, Glomerulonephritis, Uremia, Kidney failure & Nephrosis)

5. Diseases of the cardio vascular system:

- Brief review of lipoproteins (TC, TG, LDL, HDL, VLDL)
- Atherosclerosis-etiology and risk factor
- Dietary care: Ischemic heart disease, arteriosclerosis and hyperlipidemia

DC 10: PAPER 20: Practical

- Therapeutic diet chart preparation for Diabetes mellitus (Case specific)
- Therapeutic diet chart preparation for Hypertension (Case specific)
- Therapeutic diet chart preparation for Atherosclerosis (Case specific)
- Therapeutic diet chart preparation for Obesity (Case specific)
- Therapeutic diet chart preparation for Renal diseases (Case specific)

YEAR 3: SEMESTER VI

DC 13: PAPER 25: Nutraceutical and Functional Food (Theory) (Total Lectures 60)

1. Nutraceutical and Health:

- Concept, classification, sources and importance of nutraceutical.
- Role of nutraceutical on diabetes, obesity and cardiovascular diseases.

2. Oxidative stress and Nutraceutical:

- Concept of oxidant, antioxidant, oxidative stress and nutraceutical on oxidativestress.

3. Dietary fibre, Prebiotics and Probiotics:

- Classification and nutritional significance of dietary fibre.
- Prebiotics-Concept, important features, role on health.
- Probiotics in fermented milk product and non milk products.

4. Enhancing the nutritional quality of foods:

- Fundamentals of Germination and Fermentation.

5. Genetically modified food and Food fortification:

- Concept, available genetically modified (GM) foods in India, techniques for GMfood preparation, steps adopted for acceptability of GM food.
- Concept, importance and application of food fortification.

DC 13: PAPER 26: Practical

Submission of Short Review / Term paper on topic under broad area of Nutraceutical / Prebiotics / Probiotics / Genetically modified food / Food fortification / Any topic on Nutrition and Public Health (Points to be focused-Introduction, Objective, Review of Literature, Summary and conclusion, References).

DC 14: PAPER 27: Food Safety and Standards (Theory) (60 Lectures)

1. Food additive and food safety:

- Concept of food safety, factors affecting food safety.
- Food safety measures: basic concept of HACCP, Safe food handling practices and storing food safely.
- Food additives-various types and their effects on health.

2. Food security:

- Concept of food security, factors affecting food security.

3. Food adjuncts and preserved products:

- Spices (Chilies, Turmeric, Garlic and Ginger), use and nutritional aspect.
- Jams, Jellies, Pickles, Syrup, Squashes-uses and nutritional aspects.

4. Food adulterants:

- PFA definition of food adulteration, adulterants in commonly consumed food items.
- Common adulterants in food and their effects on health.

- Common household methods to detect adulterants in food,

5. Food laws and regulatory authority:

- Prevention of Food Adulteration (PFA) Act,
- Regulating authority-Codex Alimentarius, ISI, Agmark, Fruit Products Order (FPO), Meat Products Order (MPO), Bureau of Indian Standards (BIS), MMPO, FSSAI,

DC 14: PAPER 28: Practical

1. Detection of vanaspati in Ghee,
2. Detection of vanaspati in Butter,
3. Detection of Khesari flour in Besan,
4. Detection of Argemone oil in Edible oil,
5. Detection of Metanil yellow in Turmeric,

Biostatistics and Bioinformatics

DSE

1. Data and Data Types: Primary data and Secondary Data, Methods of data collection, presentation of data-diagrammatic and graphical
2. Measures of Central Tendency: Mean, Median, Mode
3. Dispersion: Range, Standard Deviation
4. Hypothesis Testing: Chi-square Test, Student's t test, Analysis of Variance (ANOVA)
5. Bioinformatics and Health Informatics: Concept and applications.
6. Nutrigenomics and Pharmacogenomics: Concept and applications.
7. Nucleic acid and Protein Data Bases, Nutrient data bases.
8. Sequence similarity searching by BLAST, Principle, features and types of BLAST, Significance of Multiple Sequence Alignments, Phylogenetic Tree.

Practical:

1. Computerized (MS Excel) presentation of bar diagram, histogram, line diagram, piechart using various data.
2. Retrieval of nucleic acid/protein sequence from data bases, Storing of sequence and conversion of one sequence format to another, Sequence alignment (pair-wise alignment and multiple sequence alignment).
3. Retrieval of protein structure from Protein Data Bank, Protein structure visualization.

Food Spoilage and Food Preservation

1. Fundamentals of food spoilage:

- Classification of food based on pH
- Definition-shelf life, perishable and semi perishable foods, shelf stable foods
- Role of microorganisms in the spoilage of different kinds of food – cereal and cereal products, vegetables and fruits, fish and other sea foods, meat and meat products

2. Preservation by low and high temperature:

- Principle of freezing, changes occurring during freezing
- Types of freezing - slow freezing, quick freezing
- Heat preservation methods: Sterilization, Pasteurization and blanching

3. Preservation by Moisture control:

- Concept of drying and dehydration, differences between sun drying and dehydration (i.e. mechanical drying)
- Factors affecting rate of drying, types of driers used in the food industry

4. Preservation by Irradiation:

- Units of radiation, kinds of ionizing radiations used in food irradiation
- Mechanism of action, concept of cold sterilization

Practical:

Visit to Food Industry / Dairy Industry and Report Preparation (Special attention: Processing, Packaging, Preservation techniques, food plant sanitation and hygiene).

OR

Training Workshop/Short-Term Course on Food Processing Technology/Food Microbiology/Food Preservation from Nutrition and Dietetics/Nutrition and Public Health/Food and Nutrition department of any University/Research Institute/Community Science Centre/Rural Technology Centre and documentation of the work followed by report preparation.

Immunology and Toxicology

1. Immunology:

- Basic concept of immunity, Types of immunity-Naturally acquired active and passive immunity, artificially acquired active and passive immunity

2. Humoral immune system:

- Mechanisms, the antigens and antibodies-their structure

immunoglobulin isotypes-IgG, IgM, IgA, IgD, and IgE

3. Cell mediated immune system;

- Types of effector T cells, mechanisms of cell mediated immunity

4. Toxicology;

- Brief history, Different areas of modern toxicology, classification of toxic substances, various definitions of toxicological significance

5. Toxic agents;

- Human exposure, mechanism of action and resultant toxicities of the following xenobiotics: **Metals:** lead, arsenic, **Pesticides:** organophosphates, carbamates, organochlorine and anticoagulant pesticides

6. Eco-toxicology;

- Brief introduction to avian and aquatic toxicology, movement and effect of toxic compounds in food chain (DDT, mercury), bioaccumulation, biomagnification, concept of BOD and COD

7. Clinical toxicology;

Management of poisoned patients, clinical methods to decrease

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