

NOTIFICATION NO: 17-PSC (DR-P) OF 2023 DT: 15.05.2023

JAMMU AND KASHMIR PUBLIC SERVICE COMMISSION

**SYLLAUBS FOR THE POST OF ASSISTANT PROFESSOR NUTRITION IN
HIGHER EDUCATION DEPARTMENT**

UNIT 1

PUBLIC HEALTH & COMMUNITY NUTRITION

- Primary Health Centre - Concept, functions, organization, current status in India and delivery of service, Taluk level hospital, and immunization.
- Anganwadi - its management, and duties of public health nutritionist in Anganwadi.
- Demographic profile - population trends in India, density of population, demographic transition, population structure, sex ratio, family size, literacy and education, morbidity rate, and life expectancy.
- Adequate nutrition and malnutrition.
- Role of public health nutritionists in the health care delivery system
- Assessment of the nutritional status of individuals and population
- Significance of nutritional assessment of the community
- Methods for assessing nutritional status., Direct Methods-Anthropometry, biochemical, clinical, dietary, and functional methods of assessments. Indirect methods - demography, population dynamics, and vital statistics.
- Approaches and strategies for improving nutritional status and health-based interventions. Food-based interventions.
- Perspectives in food and nutrition security – basic concepts, production, distribution, access, availability, losses and consumption, food and nutrition security at national, household, and individual levels. Food Security Programs- Public Distribution System (PDS), Antyodaya Anna Yojana (AAY), Annapurna Scheme, Food for Work Programme.
- Nutritional surveillance system (NSS) - Objectives, initial assessment indicators for use in nutritional surveillance, Triple A approach.
- Nutrition in emergencies and disasters - Natural and manmade disasters resulting in emergency situations., Macro and micronutrient deficiencies, and Infection in Emergencies. Scope for malnutrition assessment, indicators, and simple screening methods. Nutritional relief and rehabilitation - Assessment of food needs, food distribution strategy, targeting food aid, mass, and supplementary feeding, special foods/rations for nutritional relief, transportation and storage, feeding centers, sanitation and hygiene, and ethical considerations
- Prevalence of malnutrition in India.

UNIT 2

NUTRITIONAL BIOCHEMISTRY

- Carbohydrates: Occurrence and physiological functions, Review of metabolism of carbohydrates. Hormonal regulation of CHO metabolism. Lactose intolerance. Dental caries. Sugar alternatives.
- Role of dietary fiber in health and disease. Disorders related to carbohydrate metabolism. Glycemic index and Glycemic load of foods and their uses. RDA-ICMR and WHO
- Lipids – Classification and Functions, Review of metabolism of Lipid, Concepts of visible and invisible fats, EFA, SFA, MUFA, PUFA – sources and physiological functions. Role of lipoproteins (Chylomicrons, VLDL, IDL, LDL, and HDL), cholesterol, triglycerides in health and disease.
- Proteins – Classification and Functions, Review of metabolism of Protein, Concepts of essential and non-essential amino acids – their role in growth and development. Physiological functions of proteins. Requirements, nitrogen balance concept. Methods of evaluating protein quality. Protein malnutrition., Muscle wasting – clinical features and biochemical changes. RDA-ICMR and WHO.
- Water- and Fat-Soluble Vitamins. Macro, Micro and Trace minerals- Sources, Digestion, Absorption, Transport, and Storage Functions and Mechanisms of Action, Metabolism and Excretion, RDA, Deficiency and Toxicity. Health and nutrient claims in food and dietary Supplement. Detoxification – Xenobiotics, enzyme systems involved mechanism of detoxification.

UNIT 3

CLINICAL AND THERAPEUTIC NUTRITION

- Guidelines for dietary planning - Weights and Measures.
- Nutritional Assessment, care process, and Intervention
- Objectives of diet therapy, Routine Hospital diet - regular diets, clear fluid diet, full fluid diet, soft diet, modifications of food and nutrient intake,
- Enteral nutrition, parenteral nutrition, Refeeding syndrome, Transitional feeding.
- Medical and nutritional care record types and uses, Format for medical and nutrition charting, and documentation record
- Role of a dietitian on hospitalized and outdoor patients and development of nutritional care plan.
- Specific functions of a therapeutic, administrative, and consultant dietitian. Team approach in patient care. Psychological considerations in feeding the patients.
- Nutrition counseling- concept, components, activities for behavior changes, intervention counseling models, types of counseling sessions in patients.

- Weight imbalances, anorexia nervosa and Bulimia nervosa, cardiovascular disorders, Diabetes Mellitus-Type I, II, GI Tract Disorders, Liver and gall bladder, Pancreatic disorders, renal disorder, gout, cancer, Musculo -skeletal disorders (Rheumatoid Arthritis, Osteoarthritis, Osteoporosis), Respiratory problems, hypermetabolic conditions- Burns, Sepsis, Surgery.
- Neurological disorders attributed to nutritional etiologies (Wernicke-Korsakoff syndrome and Stroke). Neurological disorders attributed to non-nutritional etiologies (Parkinson's disease, epilepsy, Huntington's chorea, Amyotrophic lateral sclerosis, multiple sclerosis, myasthenia gravis, Alzheimer's disease, and Wilson's disease).
- Food- Drug Interaction
- Immune – deficiency disorders - Infections and AIDS, Genetic disorders, inborn errors of metabolism. Management of diet-related health disorders- Food allergy, food poisoning, alcohol, drugs

UNIT 4

HUMAN PHYSIOLOGY

- Cell structure and function
- Levels of cellular organization and function – organelles, tissues, organs and systems
- Cell membrane transport across cell, membrane and intercellular communication
Regulation of cell multiplication.
- Musculoskeletal system
- Digestive system
- Circulatory and Cardio Vascular system
- Excretory system
- Immune system
- Endocrine system

UNIT 5

FOOD MICROBIOLOGY

- Importance and significance of microorganisms in food science.
- Factors affecting the growth of microorganisms in food – Intrinsic and Extrinsic parameters
- Determination of microorganisms and their products in food: Sampling, sample collection, transport and storage, sample preparation for analysis.
- Microscopic and culture-dependent methods- Direct microscopic observation, culture, enumeration and isolation methods;

- Chemical and Physical methods-Chemical, immunological and nucleic acid based methods; Culture-independent techniques – PCR Based, DGGE, Metagenomics, etc.;
- Analytical methods for microbial metabolites- microbial toxins and metabolites.
- Protection and preservation of Foods: Chemical, Modified atmosphere, Radiation in foods from the microbiological angle.
- Indicators of water and food safety and quality: Microbiological criteria of foods and their Significance. The HACCP and ISO systems for food safety.
- Food spoilage: characteristic features, dynamics and significance of spoilage of different groups of foods - Cereal and cereal products, vegetables and fruits, meat poultry and sea foods, milk and milk products, packed and canned foods.
- Foodborne diseases: Bacterial foodborne diseases (Staphylococcal intoxication, Botulism, Salmonellosis, Shigellosis, Enteropathogenic Escherichia Coli Diarrhoea , Clostridium Perfringens gastroenteritis, Bacillus cereus Gastroenteritis) Food Borne Viral Pathogens (Norwalk virus, Norovirus, Reovirus, Rotavirus, Astrovirus, Adenovirus, Parvovirus, Hepatitis A Virus) Food Borne Animal Parasites Protozoa –Giardiasis, Amebiasis, Toxoplasmosis, Sarcocystosis, Cryptosporidiosis. Cysticercosis /Taeniasis. Roundworm – Trichinosis, Anisakiasis.
- Mycotoxins: Aflatoxicosis, Deoxynivalenol Mycotoxicosis, Ergotism. Drug resistance - phenomena and mechanism.

UNIT 6

RESEARCH METHODOLOGY

- Types of research. Research approaches, Significance of research, Research and scientific methods, Research process, and Criteria of good research.
- Definition and Identification of a Research Problem – Selection of Research problem, Justification, Theory, Hypothesis, Basic Assumptions, Limitations, and delimitations of the problem.
- Research Design – Meaning and needs, Features of a good design; important concepts relating to research design, Variables, Experimental and Control groups, Different research designs–exploratory, descriptive, and diagnostic, Hypothesis testing research.
- Sampling Design– Population and Sample, Steps in sampling design, Criteria for selecting a sampling procedure, Different types of sampling techniques–Probability sampling and non-probability sampling.
- Methods of Data collection–Schedules and Questionnaires, Interviews, Case studies, home visits, Scaling methods, Reliability and Validity of measuring instruments.
- Classification and tabulation of data. Measurement of central tendency, measures of variation.
- Frequency distribution, histogram, frequency, polygons, ogive.

- Binomial distribution, Normal distribution – Use of normal Probability tables
- Parametric, non-parametric tests.
- Testing of hypothesis, Type I, and II errors. Level of significance.
- Chi-Square test.
- Application of student's t-test for small samples.
- Correlation, Coefficient of correlation, rank correlation.
- Analysis of Data – Graphical and Diagrammatic Presentation.
- Interpretation – Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation– Interpretation of tables and figures.
- Report Writing - Significance of report writing, Different steps in writing a report; Types of reports, Mechanics of writing a Research Report, and precautions for writing research reports.
- Use of Computers in Statistical Analysis – The computer system and technology, are important characteristics of computer applications in research.

UNIT 7

NUTRITION COMMUNICATION

- Concepts & Scope
- Models of communication
- Communication Process
- Approaches and Barriers to Communication
- Communication for Extension Education and Development
- Introduction to IEC Aims and Objectives, Importance of IEC
- Relevance to programs - Nutrition education for behavior change – Rationale, Planning Execution, and evaluation of Intervention Programs
- Different Media, their characteristics, and use

UNIT 8

TECHNIQUES IN FOOD ANALYSIS

- Food Regulations and Standards
- Sampling methods
- Sample preparation for analysis
- Statistical evaluation of analytical data
- Official Methods of Food Analysis.
- Moisture in foods - determination by different methods

- Ash content of foods, wet, dry ashing, microwave ashing methods; Significance of Sulphated Ash, water-soluble ash, and acid-insoluble ash in foods
- Titratable Acidity in foods
- Determination of dietary fiber and crude fiber.
- Determination of Total fat in foods by different methods
- Analysis of oils and fats for physical and chemical parameters
- Quality standards, and adulterants
- Different methods of determination of protein and amino acids in foods
- Determination of total carbohydrates, starch, disaccharides, and simple sugars in foods.
- Basic Principles of Spectrophotometric analysis, AAS and ICP-AES, ICP-MS, Fluorimeter, Tintometer, Chromatographic Techniques

UNIT 9

FOOD SAFETY, QUALITY CONTROL & FOOD TOXICOLOGY

- Importance of food safety in the food processing industry Risk classification
- National and international food regulatory agencies
- General food laws and food safety regulations
- Nutritional labeling regulation
- Food Safety Programs
- Good Manufacturing Practices
- Pest Control Program, Facility Maintenance, Personal Hygiene, Supplier Control, Sanitary Design of Equipment and Infrastructure, Procedures for Raw Material Reception, Storage and Finished Product Loading, Sanitation Program, Product Identification, Tracking and Recalling Program, Preventive Equipment Maintenance Program, Education and Training Program
- Hazard Analysis and Risk Assessment
- Food Hygiene Programs
- Food safety regulation in India
- Classification of toxic agents; characteristics of exposure; spectrum of undesirable effects; interaction and tolerance; biotransformation and mechanisms of toxicity.
- Evaluation of toxicity
- Animal models as predictors of human toxicity: Legal requirements and specific screening methods as per OECD guidelines in vitro and in vivo studies; clinical trials.
- Natural toxins in food, determination, and their management.
- Food allergies and sensitivities
- Environmental contaminants and drug residues in food
- Food additives and toxicants added or formed during food processing

UNIT 10

FOOD SERVICE MANAGEMENT

- History and Development of food service establishment.
- Factors affecting development, recent trends, Types of food service establishment.
- Approaches to management – Theories of management Principles and aspects of management and management tools.
- Entrepreneurship and Food Service Management Conceptual perspective of entrepreneurship, creativity and innovation, Business requirements for food products, Entrepreneurship Development, and training.
- Personnel Management – Staff planning and Management, the Employment process, staff recruitment and selection, placement and training, employee laws, trade unions, and negotiations, leadership, formal relationships and duties, work design, and work measurement in food service operations.
- Food Management – Menu – Planning, purchase, and storage, Quality food production, planning and control, kitchen production, records and control, delivery and service styles, and types of food service systems.
- Kitchen layout and equipment – steps in planning and layouts. Determining equipment selection and placement, and maintenance of equipment.
- Sanitation and safety – Plant sanitation and safety, considerations necessary for an efficient cleaning program, Post cleaning care, and cleaning premises and surroundings.
- The 3 E's of safety, standards, Policies, and schedules, Microbiology and food safety, foodborne illness, Modes of Disease transmission, Food spoilage, importance of pest control, Hygienic food handling.