

Beachelor in Human Nutrition (BEACHELOR-HN) First Year

BASIC NUTRITION

Subject Code : BHN-101

Min. Hrs - Theory : 100 hrs & Practical : 80 hrs.

THEORY

1. Introduction to nutrition -
Food as source of nutrients, functions of food, definition of nutrition, nutrients & energy, adequate, optimum & good nutrition, malnutrition.
2. Nutrition - Fitness, Athletics & Sports.
3. Food guide - Basic five food groups
How to use food guide (according to R.D.A.)
4. Interrelationship between nutrition & health : -
Visible symptoms of goods health
5. Use of food in body - Digestion, Absorption, transport & utilization.
6. Role of fibres in human nutrition.
7. Carbohydrates : Functions, classification, food sources, storage in body.
8. Fats & oils : composition, saturated and unsaturated fatty acids, classification, food sources, function of fats.
9. Proteins - composition, sources, essential & non-essential amino acids, functions, Protein deficiency.
10. Water - as a nutrient, function, sources, requirement, water balance & effect of deficiency.
11. Minerals - macro & micronutrients. - functions, sources. Bioavailability and deficiency of Calcium, Iron, Iodine, Sodium & Potassium (in very brief)
12. Vitamins (water & fat soluble) - definition, classification & functions.
13. Effect of cooking & heat processing on the nutritive value of foods.
14. Processed supplementary foods.
15. Food sanitation in hygiene.

PRACTICAL

1. Use and care of kitchen equipments.
2. Controlling techniques -
Weights and measures standard, household measures for raw and cooked food.
3. Food preparation and classifying recipes as good, moderate or poor, sources of specific nutrients, Amount of ingredients to be in standard recipe -
 - a) portion size -
 - b) Beverages - tea, coffee, cocoa, fruit juice, milk, milk shakes.
 - c) Cereals and flour mixtures - basic preparation & their nutritive value -
boiled rice and rice pulao, chapati, puri, paratha, sandwiches, pastas, pancakes, cookies & cakes.
4. Vegetables & fruits -
Simple salads, Dry vegetables, Curries, fruits preparation using fresh and dried stewed fruit, fruit salad
5. Mix and milk products
Porridges, Curds, paneer and their commonly made preparations, Milk based simple desserts and puddings, custard, kheer, ice cream
6. Meat - cuts of meat -
Meat preparations, Poultry, Fish, hard and soft cooked, poached, scrambled, fried omlette & egg-nogs.
7. Soups - Basic, clear and cream soups.
8. Snacks- Pakoras, cheese toast, upma, pohe, peanut, chikki, til & laddo

HUMAN PHYSIOLOGY

Subject Code : BHN-102

Min. Hrs - Theory : 100 hrs & Practical : 80 hrs.

THEORY

- 1. Cell** - Structure and function
- 2. Blood** - Blood cells, Haemoglobin, Blood groups, Coagulation Factors , Anaemia
- 3. Skeletal System** -Bones, joints & bone deformities in brief.
- 4. Cardiovascular system**
Heart rate, Cardiac cycle, cardiac output, blood pressure, hypertension, radial pulse.
- 5. Lymphatic system** -Lymph glands and its function, spleen -structure and functions.
- 6. Respiratory System** -Ventilation , Functions , Lungs volumes and capacities.
- 7. Gastrointestinal System** -Process of digestion in various parts.
- 8. Endocrinology**
List of Endocrine glands, Hormones : Their secretion and functions (in brief).
- 9. Excretion system** -Structure of nephron , Urine formation
- 10. Central Nervous System**
Parts, Sliding Filament Theory , Neuro Muscular Junction , Wallerian Degeneration, Motor Nervous system - Upper motor neuron system & lower motor neuron system. Sensory nervous system, Sympathetic Nervous system & Parasympathetic nervous system.
- 11. Skin** - Structure and functions
- 12. Reproductive system**
Structure and functions of male & female reproductive organs, menstruation, puberty, menopause, fertilization and development of fertilized ovum, placenta and its function.
- 13. Special senses**
Structure and function of eye and ear, common diseases of eye and ear (in brief)

PRACTICAL

1. Microscope and its use.
2. Microscopic appearance of prepared slide.
3. Identification of blood cells by study of peripheral blood smear.
4. Measurement of pulse and blood pressure.
5. Elicitation of Reflexes and jerks.
6. Estimation of haemoglobin, RBC, WBC, TLC, DLC and ESR.

NUTRITIONAL BIOCHEMISTRY

Subject Code : BHN-103

Min. Hrs - Theory : 100 hrs & Practical : 80 hrs.

THEORY

- 1. Basics of energy metabolism, nutrition & dietetics** -
Unit of measuring energy, calorific value of food, BMR & factors affecting it, SDA of food, calculation of energy requirement, balanced diet, nutrition in health & diseases (protein energy malnutrition).
- 2. Chemistry of carbohydrates & their related metabolism** -
Introduction, definition, classification, biomedical importance
Brief outline of metabolism :
Glycogenesis & glycogenolysis (in brief), Glycolysis, citric acid cycle & its significance, HMP shunt & Gluconeogenesis (in brief), regulation of blood glucose level.
- 3. Amino acids** - Definition, classification, essential & non essential amino acids.

- 4. Chemistry of Proteins & their related metabolism -**
Introduction, definition, classification, biomedical importance
Metabolism :
Transformation, Decarboxylation, Ammonia formation & transport, Urea cycle.
- 5. Chemistry of Lipids & their related metabolism -**
Introduction, definition, classification, biomedical importance, essential fatty acids, identification of fats & oils (saponification no, acid no, iodine no, acetyl no, reichert-miesel no. etc.)
Brief out line of metabolism :
Beta oxidation of fatty acids, Ketosis, Cholesterol & it's clinical significance, Lipoproteins in the blood composition & their functions in brief, Atherosclerosis.
- 6. Enzymes -**
Introduction, definition, classification, coenzymes, isoenzymes, properties, factors affecting enzyme action, enzyme inhibition, diagnostic value of serum enzymes - Creatinine kinase, Alkaline phosphatase, Acid phosphatase, LDH, SGOT, SGPT, Amylase, Lipase, Carbonic anhydrase etc.
- 7. Acid base balance concepts & disorders -** pH, Buffers, Acidosis, Alkalosis
- 8. Hormones -**
Classification, general mode of action, hormones of Pituitary, Thyroid, Parathyroid, Adrenals, Reproductive Glands, Pancreas, hormonal disorders, counter regulatory hormones.
- 9. Vitamins -**
Water & fat soluble vitamins, sources, requirement, deficiency disorders & biochemical functions.
- 10. Water metabolism-**
Distribution of fluids in the body, ECF, ICF, Water metabolism, dehydration.
- 11. Hyperglycemia & hypoglycemia -**
Diabetes mellitus - definition, types, features, gestation diabetes mellitus , glucose tolerance test, glycosurias,
Hypoglycemia & its causes
- 12. Liver functions and their assessment -**
Based on -
 - a) Carbohydrate metabolism
 - b) Protein metabolism
 - c) Lipid Metabolism
 - d) Measurements of serum enzyme levels
 - e) Bile pigment metabolism : Jaundice - its types and their biochemical findings.
- 13. Renal functions tests -**
Various tests, GFR & clearance.
- 14. Tumor markers & their clinical applications -**
Including oncofetal antigens, CEA etc.
- 15. General concepts & functions of immunoglobulins**

PRACTICAL

1. Identification of carbohydrates (Qualitative Tests)
2. Identification of proteins (Qualitative Tests)
3. To study general properties of the enzyme Urease & Achromatic time of salivary amylase.
4. Estimation of glucose in urine by Benedict's methods
5. Urine analysis - normal & abnormal constituents of urine.
6. Blood glucose estimation.

FAMILY MEAL MANAGEMENT

Subject Code : BHN-104

Min. Hrs - Theory : 100 hrs & Practical : 80 hrs.

THEORY

1. Introduction to meal management - balanced diet, food groups & the planning of balance diet.
2. Food guides for selecting adequate diet .
3. Diet therapy
4. Diet & stress in current scenario.
5. Meal planning for the family.
6. Indian meal patterns - vegetarian & non-vegetarian.
7. Food faddism & the faulty food habits.
8. Nutritive value of common Indian recepies.
9. Nutrition in pregnancy - Physiological stages of pregnancy, nutritional requirements. food selection, complication of pregnancy.
10. Nutrition during lactation - Physiology of lactation, nutritional requirements.
11. Nutrition during infancy - growth & development, nutritional requirements, breast feeding, infant formula, introduction of supplementary foods.
12. Nutrition during early childhood (Toddler/Preschool)- Growth & nutrient need, nutrition related problems, feeding patterns.
13. Nutrition of school children- Nutritional requirement, importance of snacks, school lunch.
14. Nutrition during adolescence - Growth & nutrient needs, food choices, eating habits, factor influencing needs.
15. Nutrition during adulthood - Nutritional requirements, feeding pattern.
16. Geriatric nutrition : Factors affecting food intake and nutrient use, nutrient needs, nutrition related problems.

PRACTICAL

Planning, preparation and nutritional evaluation of diets in relation to activity levels and physiological state.

1. Planning and preparation of a balanced diet for a pregnant woman.
2. Diet during complication of pregnancy.
3. Planning and preparation of a balanced diet for a lactating woman.
4. Preparation of weaning foods.
5. Planning and preparation of a balanced diet for pre-school child.
6. Balanced diet for school going child. Preparation of packed lunch.
7. Planning and preparation of a balanced diet for adolescence.
8. Planning of meals for adult belonging to different income group.
9. Planning meal for senior citizen.
10. Project work with proper diet plan based on survey.

ON THE JOB TRAINING

Min. Hrs - 160 hrs.

1. The students of first year shall do the survey of patients suffering from various diseases and shall plan appropriate diet for them.
2. They shall maintain logbook of patients and their diets.
3. At the end of academic year their logbooks will be evaluated by the faculty concerned.

Beachelor in Human Nutrition (BECHELOR-HN) Second Year

BASIC DIETETICS

Subject Code : BHN-201

Min. Hrs - Theory : 100 hrs & Practical : 100 hrs.

THEORY

1. Role of dietarian : The hospital & community.
2. Basic concepts of diet therapy.
3. Principles of diet therapy & therapeutic nutrition for changing needs.
4. Adaptation of normal diet for changing needs.
5. Routine hospital diets - Regular diet, light diet, full liquid and tube feeding.
6. Modification of diet - Febrile conditions, infections and surgical conditions.
7. Diets for gastro - intestinal disorders, constipation, diarrhoea, peptic ulcer.
8. Diet for renal diseases - Nephritis, Nephrotic syndrome and renal failure.
9. Diet for obesity and cardiovascular disorders.
10. Diet for Diabetes mellitus.
11. Diet & nutrition in kidney diseases.
12. Nutrition in cancer.
13. Nutrition in Immune system dysfunction, AIDS & Allergy.
14. Nutrition support in metabolic disorders.
15. Nutrition in burns and surgery.
16. Nutrition - Addictive behaviour in anorexia, nervosa, bulimia & alcoholism.
17. Nutrient drug interaction.
18. Feeding the patients - Psychology of feeding the patient, assessment of patient needs.
19. Feeding infants & children - problems in feeding children in hospitals.
20. Nutrition & diet clinics - Patients checkup and dietary counseling, educating the patient and follow up .

PRACTICAL

1. Standardization of common food preparations.
2. Planning, preparation and calculation of following diets :
 - a) Normal diet.
 - b) Liquid diet
 - c) Soft diet
 - d) High and low caloric diet
 - e) Bland diet for peptic ulcer
 - f) Diet for Viral hepatitis and cirrhosis
 - g) Diet for Diabetes mellitus
 - h) Diet for Hypertension and Atherosclerosis
 - i) Diet for Nephritis and Nephrotic syndrome
3. Low and medium cost diets for P.E.M., Anemia & vitamin A deficiency.

FOOD MICROBIOLOGY

Subject Code : BHN-202

Min. Hrs - Theory : 80 hrs & Practical : 80 hrs.

THEORY

1. Introduction of microbiology and its relevance to everyday life. General characteristics of bacteria, fungi, virus, protozoa, and algae .
2. Growth of microorganisms: Growth curve, effect of environmental factors in growth of microorganism - pH , water activity , oxygen availability, temperature and others.
3. Microbiology of deficient food: Spoilage. contamination sources, types, effect on the following :
 - a. Cereal and cereal products
 - b. Sugar and sugar products.
 - c. Vegetables and fruits
 - d. Meat and meat products.
 - e. Fish, egg and poultry, Milk and milk products
 - g. Canned foods.
4. Environmental microbiology:
 - a. Water and water borne diseases.
 - b. Air and air borne diseases.
 - c. Soil and soil borne diseases.
 - d. Sewage and diseases.
5. Beneficial effect of microorganisms.
6. Relevance of microbial standards for food safety.
7. Waste product handling : -
 - a. Planning for waste disposal.
 - b. Solid wastes and liquid wastes.
8. Microbial intoxication and infections: Sources of contamination of food, toxin production and physiological action, sources of infection of food by pathogenic organisms, symptoms and method of control.
9. Relevance of microbiology standards for food safety.

PRACTICAL

1. Study of equipments in a microbiology lab.
2. Preparation of laboratory media and special media, cultivation of bacteria, yeasts and moulds.
3. Staining of bacteria: gram-staining.
4. Cultivation and identifications of important molds and yeast in food items.
5. Demonstration of available rapid methods and diagnostic kits used in identification of microorganisms or their products.
6. Visits (at least two) to food processing units or any other organization dealing with advanced methods in food microbiology

FOOD SCIENCE

Subject Code : BHN-203

Min. Hrs - Theory : 80 hrs & Practical : 80 hrs.

THEORY

1. Cereal- Structure and composition, Nutritional value, Processing- Milling, polishing, parboiling, flaking, parching, roasting, use in variety of preparations selection, storage and care, breakfast cereals.
2. Pulses: composition and nutritional value, processing, soaking, germination.
3. Cooking and fermentations: Toxic constituents of pulses, Lathyrism.
4. Nuts and oil seeds: Nutritive value , importance & classification.
5. Milk and milk products: Composition of milk, properties and effect of heat, nutritional importance, milk processing, milk products.
6. Flesh foods- selection, storage, uses and nutritional aspects of meat, fish and poultry, spoilage of fish.
7. Fruits and vegetables: Classifications, composition and importance in human nutrition storage, cooking of vegetables, changes during cooking, effect of heat, acid and alkali.
8. Sugar and Sugar products
 - (a) Form of sugar and liquid sweetness.
 - (b) Caramelization, Hydrolysis, Crystallization
 - (c) Indian confectionery
9. Beverages: Coffee, tea, and cocoa, processing composition and preparation, spices and condiments, types and composition.
10. Fats and oils: Types, role of fat in cookery.
11. Egg - composition & classification of egg & egg products, its nutritive value.
12. Baking - Types of bake products & its nutritive value.
13. Role of spices in food science - Importance , composition & classification.

PRATICAL

1. Detection of toxins and adulterants of some of the common foods.
2. Preparation of some confectionary products.
3. Preparations of some traditional, fermented and other products.
4. Preparation of soyabean products and their acceptability test.
5. Survey of marketed processed and labeling of processed food items.
6. Nutritional value & criteria of food selection in Indian diet according to ICMR.
7. Visit to confectionaries.

PERSONNEL MANAGEMENT

Subject Code : BHN-204

Min. Hrs - Theory : 100 hrs & Practical : 80 hrs.

THEORY

1. Organization and management:
 - a) Definition and types of organization.
 - b) Definition- functions and tools of management.
 - c) Technique of effective management and its application to food preparation and science.
2. Food material management:
 - a) Meaning, definition, and importance.

- b) Food selection, purchasing, receiving and storeroom management.
- c) Control in relation to the above operations (material planning, budgeting, material identification, modification and standardization, inventory control, store keeping, definition, objectives, functions, factors underlying successful storekeeping, duties and responsibilities of a storekeeper, purchasing, organization, principle, procedure, systems and quality control).
3. Personnel Management: Recruitment, selection and training of personalities, work standards, productivity, supervision, performance appraisal and motivation incentives for effective performances.
4. Labour policies and legislation: (Personnel policies related to salaries, other emoluments, allowances, leave, uniform and other prize benefit, laws and organization)- Laws affecting food service institution to study the following: (hospital, flight kitchen, hotel, restaurant, canteen, Industrial) -
 - a. Organization
 - b. Physical plan and layout.
 - c. Food and silver equipment
 - d. Sanitation and hygiene.

PRACTICAL

Visit and appraisal of any two medical organization.

1. Work simplification: food preparation, Calculating work unit, time norms etc.
2. Costing, accounting, budgeting, purchase.
3. Storekeeping: Listing and management of food items in the store.
4. Personnel recruitment: Preparations of a project and report making.
5. Maintenance of the clothing for persons and staff involved in kitchen area.
6. Prepare an inventory for evaluating staffs personal hygiene.

ON THE JOB TRAINING

Min. Hrs - 160 hrs.

1. The students of first year shall do the survey of patients suffering from various diseases and shall plan appropriate diet for them.
2. They shall maintain logbook of patients and their diets.
3. At the end of academic year their logbooks will be evaluated by the faculty concerned.

Beachelor in Human Nutrition (BACHELOR-HN) Third Year

COMMUNITY NUTRITION

Subject Code : BHN-301

Min. Hrs - Theory : 100 hrs & Practical : 100 hrs.

THEORY

1. Nutrition and health in National development.
2. Malnutrition- meaning. factors contributing to malnutrition, over nutrition.
3. Nutritional disorders- Epidemiology, clinical features, prevention and dietary treatment for Protein Energy malnutrition, nutritional anaemias & vitmain deficiency disorders .
4. Methods of assessing nutritional status:
 - a) Sampling techniques , Identifications of risk groups,
 - b) Direct assessment - Diet surveys, anthropometric, clinical and biochemical estimation.
 - c) Indirect assessment- Food balance sheet, ecological parameters and vital statistics.

5. improvement of nutrition of a community:
 - a) Modern methods of improvement or nutritional quality of food, food fortification, enrichment and nutrient supplementations.
 - b) Nutrition education themes and messages in nutrition and health, Antenatal and postnatal care.
6. Nutritional and infection relationship : Immunization and its importance, Food borne infection and intoxication diseases, foods involved, methods of prevention, Infestation of food borne diseases , Outbreak, Prevention signs and control of infection.
7. National and International agencies in uplifting the nutritional status -WHO, UNICEF, CARE, ICMR, ICAR, CSIR, CFTRI. Various nutrition related welfare programmes, ICDS, SLP, MOM, and others (in brief).
8. Community nutrition programme planning - Identification of problem, analysis of causes, resources constraints, selection of interventions, setting a strategy, implementations and evaluation of the programme.

PRACTICAL

1. Diet and nutrition surveys:
 - (a) Identification of vulnerable and risk groups.
 - (b) Diet survey for breast-feeding and weaning practices of specific groups.
 - (c) Use of anthropometric measurement in children.
2. Preparation of visual aids.
3. Field visit to
 - (a) Observe the working of nutrition and health oriented programmes (survey based result).
 - (b) Hospitals to observe nutritional deficiencies.

ADVANCED DIETETICS

Subject Code : BHN-302

Min. Hrs - Theory : 100 hrs & Practical : 100 hrs.

THEORY

1. Concept of Diet therapy : growth and source of dietetics, purpose and principles of therapeutic diets, modification of normal diet, classification of therapeutic diets.
2. Role of Dietician : Definition of nutritional care, interpersonal relationship with patient, planning and implementary dietary care, Team approach to nutritional care.
3. Routine hospital diets: Preoperative and postoperative diets, study and review of hospital diet. Basic concepts and methods of -
 - (a) Oral feeding
 - (b) Tube feeding
 - (c) Parental nutrition
 - (d) Intravenous feeding.
4. Diet in surgical conditions, burns and cancer.
5. Obesity and leanness- causes, complication and health effects, dietary treatment and other recommendation.
6. Diet in fever and infections- Types- metabolism in fever, general dietary consideration diet in influenza, typhoid fever, recurrent malaria and Tuberculosis .
7. Diet in gastritis, peptic ulcer- symptoms, clinical findings, treatment, dietary modification, adequate nutrition, amount of food, and intervals of feeding, Chemically

- and mechanically irrigating foods, four stage diet (Liquid, soft, convalescent, liberalized diet).
8. Diet in disturbances of small intestine and color.
 - Diarrhoea- (child and adult)- classification, modification of diet , fibre, residue. fluids & nutritional adequacy.
 - Constipation- flatulence - dietary considerations.
 - Ulcerative colitis (adults)- symptoms, dietary treatment.
 - Spruce, coeliac disease- disaccharide intolerance, dietary treatment.
 9. Diet in diseases of the liver, gall bladder and pancreas,
 - a) Etiology, symptoms and dietary treatment in - Jaundice, hepatitis, cirrhosis and hepatic coma.
 - b) Role of alcohol in liver diseases.
 - c) Dietary treatment in cholecystitis, cholelithiasis and pancreatitis.
 10. Gout- Nature and occurrence of uric acid, causes, symptoms and diet.
 11. Diet in allergy and skin disturbances: Definition, classification, manifestations, common food allergies and test and dieteric treatment.
 12. Diet in Diabetes mellitus:
 - a) Incidence and predisposing factors.
 - b) Symptoms-types and tests for detection.
 - c) Metabolism in diabetes
 - d) Dietary treatment & meal management
 - e) Hypoglycemic agent, insulin and its types.
 - f) Complication of diabetes.
 13. Diet in Renal diseases:

Basic renal function, symptoms and dietary treatment in acute and chronic glomerulonephritis, Nephrosis, renal failure, dialysis. urinary calculi-causes & treatment, acid and alkali producing and neutral foods and dietary treatment.
 14. Diet in Cardiovascular diseases:

Role of nutrition in cardiac efficiency, incidence of Atherosclerosis, dietary principles, Hyperlipidenmia, Hypertension- causes and dietary treatment, Sodium restricted diet, level of sodium restriction, sources of sodium, danger of severe sodium restriction.

PRACTICAL

1. Planning, preparations and calculations of diets with modified-
 - (a) Consistency
 - (b) Fibre and residue
 - (c) Diet for Diarrhoea and constipation
 - (d) Diet for peptic ulcer.
 - (e) Diet for liver disease.
2. Planning, preparation and calculation of diets in fever and infections.
3. Planning, preparation and calculation of diets for insulin dependent Diabetes mellitus, Planning, snacks. deserts and beverages for diabetes.
4. Planning, preparation and calculation of diet in cardiovascular diseases.
5. Planning, preparations and calculation of diet in Kidney failure , Kidney transplant, Renal complication & Kidney stones.
6. Planning, preparations and calculation of diet in Cancer, Trauma (burns) & Surgery

DIETETICS AND COUNSELLING

Subject Code : BHN-303

Min. Hrs - Theory : 100 hrs & Practical : 100 hrs.

THEORY

1. Practical consideration in giving dietary advice and counselling -
 - a) Factors affecting and individual food choice.
 - b) Communication of dietary advice
 - c) Consideration of behaviour modification
 - d) Motivation.
2. Counselling and educating patient
 - a) Introduction to nutrition counselling
 - b) Determining the role of nutrition counsellor
 - c) Responsibilities of the nutrition counsellor
 - d) Practitioner v/s client managed care
 - e) Conceptualizing entrepreneur skills and behaviour
 - f) Communication and negotiation skills.
3. Teaching aids used by dietitians- charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.
4. Computer application
 - a) Use of computers by dietitian
 - b) Dietary computations
 - c) Dietetic management
 - d) Education/ training
 - e) Information storage
 - f) Administrations
 - g) Research
5. Computer application
 - a) Execution of software packages
 - b) Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients
 - c) Statistical computation- mean, median, standard deviation, conclusion and regression test.

PRACTICAL

1. Project planning for any one disease.
2. Computer application for different diseases.
3. Submitting computed data.
4. Preparations of teaching aids in the field of nutrition.
5. Preparation of case history of a patient and feeding of information in the hard disc.

PROJECT WORK

Min. Hrs.-160 Hrs

1. Basic concepts of project planning
 - a) Defining objectives- Need, problem, project, feasibility, planning, formulation. - .
Identifying resources
 - b) Methods/approaches, Project Appraisal- Project Format
2. Guideline for project writing
 - Title of the project
 - Name of the person
 - Duration of the project, type of project.
 - Aims and objectives - summary of the proposed project
 - Project information, location, people and personnel involved.
 - Working/methodology
 - EvaluationWriting and reporting

