

SECOND SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

FNT-A-CC-2-3-Th: BASIC FOOD SCIENCE-II

4 CREDITS

1. Dietary Fibre-Classification, sources, composition, properties & nutritional significance. *S.M*
2. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron) Fluoride, Zinc, Selenium, Iodine, Chromium) *→ SD*
4. Vitamins - Bio-Chemical and Physiological Role Physiological role, bio-availability and requirements, sources, deficiency & excess. *SK*
5. Water - Functions, daily requirements, Water balance. *AC*

FNT-A-CC-2-3-P: BASIC FOOD SCIENCE-II

2 CREDITS

1. Determination of Ash content in food
2. Determination of Moisture content in food
3. Determination of calcium, iron, and Vitamin C content in foods.

FNT-A-CC-2-4-Th: HUMAN PHYSIOLOGY-II

4 CREDITS

- AD* 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.
- AD* 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.
- BM* 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. Reflexes, Special senses.
- BMB* 4. Endocrine system: Structure and functions of pituitary, thyroid, parathyroid and adrenal gland, Structure and functions of pancreas.

FNT-A-CC-2-4-P: HUMAN PHYSIOLOGY-II (PRACTICAL)

2 CREDITS

1. Harvard Step test
2. Identification with reasons of histological slides (Lung, Liver, Kidney, Small intestine, Stomach, Thyroid, Adrenal, Pancreas, Testis, Ovary and Muscle of mammals).
3. Qualitative determination of glucose acetone in urine.
4. Blood film staining and identification of different types of blood cells.

AD +
BM

FOURTH SEMESTER

[TOTAL CREDITS/ CORE COURSE: 6 (THEORY-4, PRACTICAL-2)]

FNT-A-CC-4-8-Th: HUMAN NUTRITION-II

4 CREDITS

- SD 1. Nutrition During Pregnancy: Factors (non-nutritional) affecting pregnancy outcome, importance of adequate weight gain during pregnancy, antenatal care and its schedule. Nutritional requirements during pregnancy and modification of existing diet and supplementation, Deficiency of nutrients, specially energy, iron folic acid, protein, calcium, iodine. Common problems of pregnancy and their managements, specially - nausea, vomiting, pica, food aversions, pregnancy induced hypertension, obesity, diabetes. Adolescent pregnancy.
- AC 2. Nutrition during Lactation: Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding.
- SK 3. Nutrition during Infancy: Infant physiology relevant to feeding and care, Breast feeding- colostrum, its composition and importance in feeding, Initiations of breast feeding. Advantages of exclusive breast feeding. Basic principles of breast feeding. Introduction of supplementary foods, initiation and management of weaning, Baby-led weaning. Bottle feeding- circumstances under which bottle feeding is to be given. Care & sterilization of bottles. Preparation of formula. Mixed feeding, breast feeding and artificial feeding
- SK 4. Management of preterm and low birth weight babies.
5. Nutritional needs of toddlers, preschool, school going children- and adolescents- Dietary management.

FNT-A-CC-4-8-P: HUMAN NUTRITION-II (PRACTICAL)

2 CREDITS

SD Planning and preparation of adequate meal for different age groups with special reference to different physiological conditions: infants, pre-schooler, school children, adolescents, adults, pregnancy, lactation and old age.

FNT-A-CC-4-9-Th: DIET THERAPY-I

4 CREDITS

1. Basic concepts of diet therapy: Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets.
2. Team approach to health care. Assessment of Patient's needs.
3. Routine Hospital Diets: Regular, light, soft, fluid, parenteral and enteral feeding.
4. Diets for different febrile conditions: influenza, malaria and typhoid.
5. Etiological factors, symptoms, and management of common diseases of stomach-Gastritis and Peptic ulcer.
6. Etiology, symptoms, and management of intestinal diseases: Diarrhoea, steatorrhoea, Diverticular disease, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, Irritable Bowel Syndrome.
7. Diseases of the liver and Biliary System: Liver function tests. Etiology, symptoms, dietary care and general management of Viral Hepatitis and Cirrhosis of liver. Dietary care and management of Gall Bladder diseases –Cholecystitis and Cholelithiasis.
8. Anaemias: General concept, aetiology, classification, and dietary management of Nutritional anaemia.

FNT-A-CC-4-9-P: DIET THERAPY-I (PRACTICAL)

2 CREDITS

1. Planning and preparation of normal diets.
2. Planning and preparation of fluid diets.
3. Planning and preparation of soft/semi solid diets.
4. Planning and preparation of Diets for the following diseases:
 - i) Peptic ulcer
 - ii) Viral hepatitis
 - iii) Anaemia

FNT-A-CC-4-10Th: NUTRITIONAL BIOCHEMISTRY-I

4 CREDITS

1. Introduction to Biochemistry: Definition, objectives, scope and inter relationship between biochemistry and other biological science.

- SR + TP
2. Enzymes: Definition, types and classification of enzymes, definition and types of coenzymes, Functions of coenzymes and cofactors, Specificity of enzymes, isozymes, enzyme Kinetics including factors affecting enzyme action, velocity of enzyme catalysed reactions, regulations of enzyme activity, zymogen, allosteric enzymes, enzyme inhibition.
 3. Intermediary metabolism: Carbohydrate Metabolism, Glycolysis, TCA cycle & energy generation, HMP Shunt pathway, gluconeogenesis, glycogenesis, glycogenolysis, blood sugar regulation.
 4. Lipids: Oxidation and biosynthesis of fatty acids (saturated & mono-unsaturated), Synthesis and utilization of ketone bodies, Ketosis, fatty livers, Essential Fatty acids, Cholesterol and its clinical significance.

FNT-A-CC-4-10-P: NUTRITIONAL BIOCHEMISTRY-I (PRACTICAL) 2 CREDITS

- SR + TP
1. Quantitative estimation of Sugars (Glucose, lactose, starch)
 2. Estimation of acid value, iodine value, Saponification value of fats
 3. Estimation of blood Glucose
 4. Estimation of serum cholesterol
- SR + TP

SIXTH SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

FNT-A-CC-6-13-Th: FOOD MICROBIOLOGY

4 CREDITS

- SR+FTP
1. Brief history of food microbiology and introduction to important microorganisms in foods.
 2. Cultivation of microorganisms, Nutritional requirements of microorganisms, types of media used, methods of isolation.
 3. Primary sources of microorganisms in foods, physical and chemical methods used in the destruction of microorganism in foods: (Sterilisation & Disinfection).
 4. Fundamentals of control of microorganism in foods: Extrinsic and intrinsic parameters affecting growth and survival of microbes, use of high and low temperature, dehydration, freezing, freeze-drying, irradiation and preservatives in food preservation.
 5. Food Spoilage: Contamination and microorganisms in the spoilage of different kinds of foods and such as cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and products, canned foods.

FNT-A-CC-6-13-P: FOOD MICROBIOLOGY (PRACTICAL)

2 CREDITS

- SR+TP
1. Introduction to microbiology:
 - Use of equipment
 - Understanding and use of compound microscope
 - Use of Autoclave
 - Use of Incubator and Inoculation chamber
 2. Microscopic identification of microorganisms (prepared slides) : Bacterial, fungal strains
 3. Preparation of liquid and solid media for culture of microorganisms.
 4. Staining Techniques to study of Morphology of bacterial cells:
 - Simple staining with methylene blue, methyl violet, carbolfuschin, etc.
 - Differential staining with Gram stain technique
 5. Microbiological techniques: Pure culture technique-Spread plate, Pour plate and Streak plate.

FNT-A-CC-6-14-Th: FOOD PRESERVATION

SK

4 CREDITS

1. Food preservation: definition, objectives and principles of food preservation. Different methods of food preservation.

2. Preserved Products: Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups-types, composition and manufacture, selection, cost, storage, uses and nutritional aspects.
3. Food Standards : ISI, Agmark, FPO, MPO, PFA, FSSAI.

FNT-A-CC-6-14-P: FOOD PRESERVATION (PRACTICAL)

2 CREDITS

- SK
1. Different methods of Food preservation – Drying, Freezing, Frying, canning, bottling etc.
 2. Aseptic handling: Sources of contamination of foods.
 3. Preparation of pickles, tomato sauce, chili sauce, jelly, tomato puree, squashes etc.

DISCIPLINE SPECIFIC ELECTIVE (DSE) SYLLABUS

FNT-A- DSE-A-5-1-Th: PUBLIC HEALTH

MB

4 CREDITS

1. Health and Dimension of Health: Positive health Versus Absence of disease
2. Secondary Sources of Community Health data :Sources of relevant vital statistics of infant, child & maternal mortality rates
3. Immunization: Importance and Immunization schedule for children, adults and for foreign travellers.
4. Community Water and Waste Management: Importance of water to the community, etiology and effects of toxic agents, water borne infectious agents, sources of water, safe drinking water, potable water, waste and waste disposal, sewage disposal and treatment, solid waste and disposal, liquid waste disposal.
5. Concept of Epidemiology: Study of the epidemiologic approach-determinants of disease preventive & social means.
6. Communicable and infective disease control: Nature of communicable and infectious diseases, infection, contamination, disinfections, decontamination, transmission-direct & indirect, vector borne disease infecting organisms and positive agents, environmental agents and epidemiological principles of disease control.
7. Public health hazards due to contaminated foods: Food borne infections and intoxications: symptoms, mode of transmission and methods of prevention, investigation and detection of food borne disease out-break.

FNT-A-DSE-A-5-1-P: PUBLIC HEALTH (PRACTICAL) MB 2 CREDITS

1. Preparation of 3 audio visual aids like charts, posters, models related to health and nutrition education.
2. Formulation and preparation of low cost and medium cost nutritious/ supplementary recipe.
3. Field visit(health centre, immunization centre, ICDS, MCH centre, NGOs etc.).

FNT-A-DSE-A-5-2-Th: MUSHROOM CULTURE 4 CREDITS

- 1 Definition and characteristics of mushroom.
- 2 Morphology and life cycle of Mushroom.
- 3 Identification and classification of mushroom
- 4 Nutritional and medicinal value of edible mushrooms; poisonous mushrooms
- 5 Types of edible mushrooms available in India- *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*.
- 6 Process of mushroom cultivation.
- 7 Storage and nutrition: short term storage (Refrigeration- upto 24 hours), long term storage (canning, pickles, papads), drying, storage in salt solutions.

FNT-A- DSE- A-5-2-P: MUSHROOM CULTURE(PRACTICAL) 2 CREDITS

- 1 Visit to Mushroom Culture Centers/ Farms for:
Process involved in mushroom cultivation
Types and varieties of mushroom
Visual Identification of edible and poisonous mushroom Marketing
- 2 Different Food preparation from mushroom

FNTA-DSE- A-6-3-Th : DIET COUNSELING AND PATIENT CARE 4 CREDITS

- AC
1. Introduction to term Dietician: Definition of Dietician , Difference between registered dietician & Nutrition
 - SM 2. Role of dietician in hospital : work area of hospital dietician, role of dietician in hospital
 - SD 3. Role of dietician in community :- work area of community dietician, role of community dietician

4. Introduction to Nutrition Care Process: Definition of Nutrition Care Process .Steps of Nutrition Care Process

5. Nutrition Assessment:-Definition , Nutrition assessment component, Critical thinking

6. Nutrition Diagnosis: nutrition diagnosis domain:- intake, clinical, behavioral – environmental

7. Nutrition diagnosis component• nutrition vs. medical diagnosis

8. Nutrition Interventions: Definition and objectives

9. Nutrition Monitoring & Evaluation : Definition, Nutrition monitoring & evaluation components, nutrition goals & objectives. Evaluation of nutrition care

FNT-A-DSE- A-6-3-P: DIET COUNSELING AND PATIENT CARE (PRACTICAL)
2CREDITS

Visit and training to hospitals/nursing homes for 7-15 days :

1 Taking Case history and study

2 Routine Hospital diet

3 Distribution of food from kitchen to individual patient with specific diet. 4

Dietary management of patient in different diseases and diet chart for the particular patient.

5 Role of dietitian /nutritionist in diet counselling

FNT-A-DSE- A-6-4-Th: GERIATRIC NUTRITION

4 CREDITS

1. Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition. Classification of old population.

2 .Physiological and biochemical changes during old age.

3. Assessment of nutritional status of older adults.

4. Nutritional requirements and general dietary guidelines for elderly .

5. Major nutritional and health problems during old age.

FNT-A-DSE- A-6-4-P: GERIATRIC NUTRITION(PRACTICAL)

2 CREDITS

1. Visit to old- age homes.

2. Preparation of dishes suitable for older person- soft, semisolid and easily digestible balanced diet.

FNT-A-DSE-B-5-1-Th: THEORIES OF HUMAN DEVELOPMENT

4 CREDITS

SKILL ENHANCEMENT COURSE(SEC)

SD

FNT-A-SEC-A-3-1-Th: SPORTS NUTRITION

2 CREDITS

1. Definition of physical activity, exercise, physical fitness, sports physiology and sports nutrition.
2. Benefits of physical activity and exercise.
3. Classification of Sports activities.
4. Nutritional requirements of sports person.
5. Pre- event meal.

SK

FNT-A-SEC-A-3-2-Th: FOOD SERVICE MANAGEMENT

2 CREDITS

1. Organization of food service management: Definition, Various types of Food Service institutions, their characteristics and functions.
2. Planning a food service unit, layout design, planning of different work areas – preparation, cleaning, storing, serving and dining areas. Lighting and ventilation, working heights in relation to equipment.
3. Institutional Menu Planning: Factors influencing menu planning, principles of menu planning, different kinds of menus.
4. Quality food Service – types-Centralized, de-centralized objectives. Styles of service.
5. Importance of sanitation and hygiene in food, kitchen hygiene, Hygienic handling of Food, employee's health, hygiene of food service unit.
6. Personnel Management- selection, training and supervision of personnel, criteria for selection of Dietitian and Food Service staff.

FNTA-SEC- B-4-1-Th: NUTRITION AND HEALTH EDUCATION

2 CREDITS

AC

1. Concept, objectives and importance of nutrition and health education
2. Principles of health education.
3. Nutrition and health education communication process.

SD

4. Steps in planning health and nutrition education.

AH₃

5. Methods involved in nutrition and health education
6. Evaluation of nutrition and health education programmes.

GENERIC ELECTIVE (GE)

FNT-G-CC/GE-1-1Th: ELEMENTARY CHEMISTRY

4 CREDITS

- TP+
SR
1. Law of conservation of mass, chemical and physical changes, Mechanical mixtures and chemical compounds
 2. Common Laboratory Processes: Sedimentation, Decantation, Filtration, Solution, Evaporation, Boiling, Desiccation, Distillation, Sublimation, Fusion, Ignition, Crystallisation, Efflorescence, Deliquescence.
 3. Symbol, Valency, Formula, Equation, Naming of Compounds, Radicals.
 4. General concept of acids, bases and salts, conjugate acids and bases, Classification of salts, Hydrolysis of salts, pH, Buffer solution. Equivalent weight of acids, bases and salts, neutralisation, Acid-Base indicators, Molar solution, Normal solution and Formula solution.
 5. Diffusion and Osmosis, Osmotic pressure, Isotonic solution, Definition and examples.
 6. Colloids: Definition, Types of colloidal systems, Important properties of colloidal sols, Dialysis.
 7. Structure of atom: Discovery of atomic nucleus, Rutherford's atomic model, concept of Stationary orbit, Electronic arrangement of elements (Hydrogen to calcium), Atomic number, Isotopes, Chemical bonds – Electrovalent, Covalent and coordinate – covalent bonds, Hydrogen bonds.
 8. Chemistry of carbon compounds: Classification of organic compounds based on structural characteristics and functional groups, isomerism, Concept of optical isomerism. General methods of preparation, properties and reactions of structured and unstructured hydrocarbons, Aliphatic monohydric alcohols, Glycerol, Aldehyde, Ketones and fatty acids upto 3 atoms with nomenclature.

FNT-G-CC/GE-1-1 P: ELEMENTARY CHEMISTRY (PRACTICA

2 CREDITS

TP+SR

1. Fitting of simple apparatus, experiment involving solution, filtration, distillation, and crystallization. Separation of constituents of mixture.
2. Titration of acids and bases. Determination of total hardness of water by soda reagent. Estimation of glucose.
3. Simple chemical tests for carbohydrate- Starch, glucose, cane sugar, lactose, and dextrin.
4. Qualitative tests-Protein in milk and egg, Calcium, phosphorus, and iron in foodstuff.

FNT-G-CC/GE-2-2-Th: ELEMENTARY PHYSICS

4 CREDITS

1. Units -C.G.S. and F.P.S. system
2. Measurement of mass and weight, common and spring balance.
3. Motion of body - displacement, velocity, acceleration units.
4. Gravity - Acceleration due to gravity.
5. Hydrostatics-Pressure at a point, Archimedes Principles, Specific gravity, viscosity and surface tension.
6. Thermometry.
7. Calorimetry.
8. Transmission of heat, Thermoflask.
9. Three types of matter, changes of state, pressure cooker, Ice-machine.
10. Static electricity - Changing by friction, conductor and Insulator.
11. Primary cell, storage cell.
12. Electroplating.
13. Definition of Potential, Current-relation between two.
14. Measurement of current by ammeter and potential differential by voltmeter.
15. Electricity and its application in daily life - lamp, Toaster, Geyser, iron, Micro-oven.
16. Refrigerator, cold storage.
17. Electric fuse.

TP

SR

FNT-G-CC/GE-2-2-P: ELEMENTARY PHYSICS (PRACTICAL)

2 CREDITS

1. Use of balance(Weighing a body)
2. Determination of specific gravity of a solid (heavier and insoluble in water).
3. Determination of specific gravity of a liquid by hydrostatic balance.
4. Determination of specific gravity of a liquid by specific gravity bottle.
5. Reading of barometer.
6. Determination of lower and upper fixed point of a thermometer.
7. Fitting of electric fuses.

se

FNT-G-CC/GE-3-3Th: ELEMENTARY PHYSIOLOGY

4 CREDITS

- SD. 1. Animal cell: Structure and function.
- SD. 2. Tissue: Definition, structure and functions of different types of tissue, e.g. epithelial, connective, nervous and muscular tissue (special emphasis on blood and bone) .

AD 3. Digestive system: Structure involve in digestive system (mouth, esophagus, stomach, small intestine, large intestine, liver, pancreas, gall bladder) and their functions. Digestion and absorption of Carbohydrate, protein and fat.

BM 4. Elementary idea of metabolism, enzymes and hormones- name and their important functions. Metabolism in brief (Glycolysis, Glycogenesis, Gluconeogenesis, Cori's cycle, Krebs's cycle, Deamination, Transamination. Role of hormones in carbohydrate metabolism.

BMT
AD } FNT-G- CC/GE-3-3-P: ELEMENTARY PHYSIOLOGY (PRACTICAL) 2 CREDITS

1. Demonstration for determination of blood pressure of humans being- (a) systolic and b) diastolic.
2. Identification of slides (Blood cells, Stomach, Small intestine, large intestine, Liver, pancreas).
3. Determination of Bleeding Time (BT) and Clotting Time (CT).
4. Detection of Blood group.

FNT-G- CC/GE-4-4-Th: BASIC NUTRITION AND FOOD SCIENCE 4 CREDITS

SD 1. Definition of Food, Nutrition, Nutrient, Nutritional status, Dietetics, Balance diet, Malnutrition, Energy (Unit of energy – Joule, Kilocalorie).

SM 2. Carbohydrate, Protein, Fat, Vitamins and Minerals (calcium, phosphorus, sodium, potassium, iron, iodine, fluorine)- sources, classification, functions, deficiencies of these nutrients. (Functions of water and dietary fiber.) SD

SD 3. B.M.R: Definition, factors affecting B.M.R. and Total Energy Requirement (Calculation of energy of individuals).

AM 4. Basic five food groups: Nutritional significance of cereals, pulses, milk, meat, fish, vegetable, egg, nuts, oils, sugar.

5. Principles and objectives of meal planning. Diet for an infant (Breast feeding versus Bottle feeding). Preschool child, school child, Normal male and female of different occupation.

SM FNT-G-CC/GE-4-4-P: BASIC NUTRITION AND FOOD SCIENCE (PRACTICAL) 2 CREDITS

1. Elementary idea of weight and measure.
2. Preparation of cereals, pulses, vegetable, egg, milk, fish, nuts.

- SM
3. Demonstration of jam, jelly, squash, pickles.
 4. Planning and preparation of diet often adult male/female Modification of diet during pregnancy and lactation.

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSES

DSE-A (Opt any one in Semester-5)

FNT-G-DSE-A-5-1-Th: COMMUNITY NUTRITION SM 4 CREDITS

1. Concept and types of Community. Concept of community nutrition.
2. Nutritional Assessment: Meaning, need, objectives and importance. A brief idea on methods of nutritional assessment.
3. Elementary idea of health agencies - FAO, WHO, ICMR, ICDS, ICAR, CSIR, ANP, VHAI, NIN and CFTRI. Role of voluntary health organisation in the improvement of Community health.
4. Nutritional Intervention programmes to combat malnutrition. Concept of food fortification and food enrichment.
5. Nutrition Education: Definition, objectives of nutrition education. Methods of imparting nutrition education.

FNT-G-DSE-A-5-1-P: COMMUNITY NUTRITION (PRACTICAL) SM 2CREDITS

1. Preparation of homemade ORS.
2. Preparation of weaning foods for infants.
3. Preparation of low cost and medium cost school tiffin.
4. Diet survey by 24 hours recall method.

FNT-G-DSE-A-5-2-Th: PUBLIC HEALTH MB 4 CREDITS

1. Concept of health and community health. Factors affecting Community health.
2. Maternal and Child mortality: Definitions and causes, Role of health workers in the improvement of maternal and child health.
3. Immunization: Importance and Immunization schedule for children and adults.

4. General idea about the contamination of food (Chemical and microbial)-Sources and transmission, Elementary ideas about food toxins, aflatoxin & food toxicology with reference to Lead, Cadmium & Zinc.
5. Contamination of water and prevention of contamination, different methods of water purification, water -borne diseases, elementary idea of microbiology of water-borne pathogens, diarrhoea, dysentery, typhoid, hepatitis, preventive measures and dietary management of such diseases.

FNT-G-DSE-A-5-2-P: PUBLIC HEALTH (PRACTICAL) MB 2 CREDITS

1. Calculation of BMI of an individual and interpretation of result.
2. Growth charts - plotting of growth charts for growth monitoring.
3. Formulation and demonstration of nutrition education tools such as charts, posters, models related to health and nutrition education.

DSE-B(Opt any one in Semester-6)

FNT-G-DSE-B-6-1-Th: CLINICAL NUTRITION AH 4 CREDITS

- *1. Definition of Dietetics, dietitian, Goals of Diet Therapy.
- *2. Basic concepts of Diet Therapy: Therapeutic adaptations of the normal diet. Routine hospital diets -Regular, soft, full fluid, clear fluid diet. Specially modified therapeutic diets.
3. Obesity and underweight: Causes, risk factors, dietary and general management of overweight and underweight.
4. Diarrhoea, Constipation and Jaundice: Causes, symptoms and dietary management.
5. Anaemia: Definition, causes, classification, and dietary management of Nutritional anaemia.
6. Hypertension, Atherosclerosis and Diabetes mellitus: Definition, Causes, Types, risk factors, Signs, Symptoms and dietary Management.
7. Fever: Definition, causes, types, symptoms and dietary management.

FNT-G-DSE-B-6-1-P: CLINICAL NUTRITION (PRACTICAL) SM 2 CREDITS

1. Planning and preparation of Therapeutic Diets for the following diseases:
 - i) Diabetes mellitus
 - ii) Hepatitis
 - iii) Hypertensi
 - iv) Obesity

FNT-G-DSE-B-6-2-Th: FOOD SAFETY AND QUALITY CONTROL 4 CREDITS

1. The relationship of microorganisms to sanitation, Effects of microorganisms on food degradation and food-borne illnesses.
2. Importance of personal hygiene of food handlers: Habits, clothes, illness, education of food handler in handling and serving food. Concept of food contamination.
3. Food Safety: Definition and factors affecting food safety, safety of left over foods. Control of Food spoilage.
4. Food Adulteration: Definition, reasons and types. Adulterants in common food items.
5. Food Laws and Standards:
 - i) Codex Alimentations
 - ii) Prevention of Food Adulteration (PFA) Act
 - iii) Agmark
 - iv) Fruit Products Order (FPO)
 - v) Meat Products Order (MPO)
 - vi) Bureau of Indian Standards (BIS)
 - vii) Food Standards and Safety Authority of India(FSSAI)

FNT-G- DSE-B-6-2-P: FOOD SAFETY AND QUALITY CONTROL (PRACTICAL)2 CREDITS

1. Detection of common adulterant in food:
 - i) Khesari flour in besan
 - ii) Vanaspati in Ghee/Butter.
 - iii) Dried papaya seeds in black pepper
 - iv) Metanil yellow in turmeric or coloured sweet products.
 - v) Artificially foreign matter in tea (dust/leaves).

SEC-A (Opt any one either in semester-3 or in Semester-5)

FNT-G-SEC- A-3/5-1-Th: FOOD PRESERVATION SM+AC 2 CREDITS

1. Elementary idea on food preservation: principles and different methods – drying, freezing, frying, canning etc.
2. Methods of preparation and packaging of jam, jelly, chilli sauce, tomato ketchup, squash, pickles etc.

FNT-G-SEC-A-3/5-2-Th: NUTRITION AND FITNESS SM 2 CREDITS

1. Understanding Fitness: Definition of fitness, health and related terms. Assessment of fitness, Approaches for keeping fit.
2. Importance and benefits of physical activity: Physical Activity – frequency, intensity, time and type with examples Physical Activity, physical activity guidelines and physical activity pyramid.
3. Importance of nutrition Role of nutrition in fitness, Nutritional guidelines for health and fitness, Nutritional supplements.
4. Importance of diet and exercise for weight management.

SEC-B (Opt any one either in semester-4 or in Semester-6)

FNT-G-SEC-B-4/6-1-Th: GERIATRIC NUTRITION 2 CREDITS

- SM
1. Definition of ageing, senescence, old age or aged people, gerontology, geriatrics, and Geriatric nutrition.
 2. Physiological changes during old age.
 4. Nutritional requirements and general dietary guidelines for elderly .
 5. Major nutritional and health problems during old age.

FNT-G-SEC-B-4/6-2-Th: BAKERY SCIENCE 2 CREDITS

1. Introduction and scope of bakery science.
2. Common bakery terms
3. Flours: Constituents of flour, water absorption power, gluten, grades of flour.
4. Raw materials required for bread and cake making.
5. Role of flour, water , yeast, salt, sugar, milk and fats in bakery.
6. Bread and cake making process.
7. Bread improver.
8. Knowledge of oven and baking temperatures.
9. Preparation of basic cookies, biscuits and pastries

REFERENCE BOOKS FOR FOOD AND NUTRITION GENERAL COURSE

CORE COURSE (CC)

FIRST SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

FNT-A-CC-1-1-Th: BASIC FOOD SCIENCE

4 CREDITS

- A.C
1. Basic concept on Food, Nutrition and Nutrients. Classification of Food, Classification of Nutrients.
- S.M
2. Carbohydrates - Definition, Classification, Structure and properties.
Monosaccharides - glucose, fructose, galactose.
Disaccharides - Maltose, lactose, sucrose
Polysaccharides - Dextrin, starch, glycogen, resistant starch.
Carbohydrates - Sources, daily requirements, functions. Effects of too high and too Low carbohydrates on health. Digestion and absorption of carbohydrate.
- S.D
2. Lipids -Definition, Classification & Properties. Fatty acids-composition, properties, types. Lipids - sources, daily requirements, functions. Digestion & Absorption of nutrients. Role & nutritional significances of PUFA, MUFA, SFA, W-3 fatty acid.
- SK
3. Proteins- Definition, Classification, Structure & properties. Amino acids- Classification, types, functions. (Proteins - Sources, daily requirements, functions. Effect of too high - too low proteins on health. (Digestion & absorption. Assessment of Protein quality (BV, PER, NPU). Factors affecting protein bio-availability including anti-nutritional factors.

FNT-A-CC-1-1-P: FOOD SCIENCE (PRACTICAL) TP & SR 2 CREDITS

1. Identification of Mono, Di and polysaccharides
2. Identification of Proteins
3. Identification of glycerol.

FNT-A-CC-1-2-Th: HUMAN PHYSIOLOGY-I

4 CREDITS

- AD
1. Unit of Life: Structure and functions of cell with special reference to Plasma membrane (Fluid Mosaic Model), Mitochondria, Ribosome, Endoplasmic reticulum, Nucleus (nuclear membrane, nuclear chromatin and nucleolus), Nucleotide, Homeostasis, Positive and negative feed back
 2. Circulatory and Cardiovascular system: Blood and its composition, formed elements, Blood groups, Mechanism of blood coagulation, Introduction to immune system, Erythropoiesis and anaemia, Structure and functions of heart, Cardiac cycle, cardiac output, blood pressure and its regulation.
 3. Digestive System: Structure and functions of G.I. tract, Process of digestion and absorption of food, Structure and functions of liver, gallbladder and pancreas.
 4. Respiratory System: Structure of Lungs and gaseous exchange (oxygen and carbon dioxide transport).
 5. Musculoskeletal System: Formation and functions of muscles, bones. Mechanism of muscle contraction, isometric and isotonic muscle contraction.
- BM

FNT-A-CC-1-2-P: HUMAN PHYSIOLOGY-I (PRACTICAL) A.D + BM 2 CREDITS

1. Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method)
2. Determination of blood pressure by Sphygmomanometer (Auscultatory method).
3. Measurement of Peak Expiratory flow rate.
4. Determination of Bleeding Time (BT) and Clotting Time (CT).
5. Detection of Blood group (Slide method).
6. Measurement of Haemoglobin level (Sahli's or Drabkin method).

THIRD SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

FNT-A-CC-3-5-Th: HUMAN NUTRITION-I

4 CREDITS

- SK SD 1. Concept and definition of terms-Nutrition, Malnutrition and Health: Scope of Nutrition.
- SD 2. Minimum Nutritional Requirement and RDA: formulation of RDA and Dietary Guidelines Reference Man and Reference Woman, Adult consumption unit.
- S.M 3. Energy in Human Nutrition: Idea of Energy and its unit, Energy Balance, Assessment of Energy Requirements—deficiency and excess, Determination of Energy in food, B.M.R. and its regulation, S.D.A.
- AC 4. Growth & Development from infancy to adulthood: Somatic, physical, brain and mental development, puberty, menarch, pre-pubertal and pubertal changes, Factors affecting growth and development. Importance of Nutrition for ensuring adequate development.
- SK 5. Growth monitoring and promotion: Use of growth charts and standards, Prevention of growth faltering.

FNT-A-CC-3-5-P: HUMAN NUTRITION-I (PRACTICAL)

S.M

2 CREDITS

- SM 1. Process involved in cooking: pressure cooking, microwave, steaming, grilling, deep fat frying.

2. General concepts of weights and measures. Eye estimation of raw and cooked foods
3. Preparation of food from different food groups and their significance in relation to health.
4. Preparation of supplementary food for different age group and their nutritional significance.
5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child

FNT-A-CC-3-6-Th: COMMUNITY NUTRITION

4 CREDITS

- SD 1. Concept of Community, types of Community, Factors affecting health of the Community.
- SD 2. Nutritional Assessment and Surveillance: Meaning, need, objectives and importance
 3. Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods.
 4. Diet survey; Need and importance, methods of dietary survey, Interpretation - concept of consumption unit, individual and total distribution of food in family, adequacy of diet in respect to RDA, concept of family food security.
 5. Clinical Signs: Need & Importance's, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs.
 6. Nutritional anthropometry: Need and importance, standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements. Use of growth chart.
- SM 7. International, national, regional agencies and organisations. Nutritional intervention programmes to combat malnutrition.

FNT-A-CC-3-6-P: COMMUNITY NUTRITION (PRACTICAL) AC 4 CREDITS

1. Anthropometric Measurement of infant - Length, weight, circumference of chest, mid-upper arm circumference, precautions to be taken.
2. Comparison with norms and interpretation of the nutritional assessment data and its significance. Weight for age, height for age, weight for height, body Mass Index (BMI) Waist - Hip Ratio (WHR). Skin fold thickness.
3. Growth charts - plotting of growth charts, growth monitoring and promotion.
4. Clinical assessment and signs of nutrient deficiencies specially PEM (Kwashiorkor, marasmus) I vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.

5. Estimation of food and nutrient intake: Household food consumption data, adult consumption unit, 24 hours dietary recall 24 hours record, Weighment method, food diaries, food frequency data, use of each of the above, information available through each individual, collection of data, estimation of intakes.

FNT-A-CC-3-7-Th: FOOD COMMODITIES

4 CREDITS

- SK 1. Cereals and Millets: Structure, processing, storage, use in various preparation, variety, selection and cost. Cereal products, breakfast cereals, fast food.
- SD 2. Pulses and Legumes: Structures, Selection and variety. Storage, Processing and use in different preparations, Nutritional aspects and cost.
- SK 3. Milk and Milk products : Composition, Classification, Selection Quality and Cost, Processing, Storage and uses in different preparations, Nutritional aspects, shelf life and spoilage.
- SD 4. Eggs: Production, grade, quality selection, storage and spoilage, cost nutritional aspects and use in different preparations.
- S.M 5. Meat, Fish and Poultry: Types, Selection, Purchase, Storage, Uses, preparations Cost, Spoilage of fish Poultry and meat.
- S.M 6. Vegetables and Fruits: Variety, Selection, purchase, storage, availability causes and nutritional aspects of raw and processed products and use in different preparations.
- S.M 7. Sugar and sugar Products: Types of natural, sweeteners, manufacture, selection, storage and use as preserves, stages in sugar cookery.
- SD 8. Fats and Oils: Types and sources (animal and vegetable), Processing, uses in different preparations, storage, cost and nutritional aspects.
- SD 9. Raising and Leavening agents: Types, constituents, uses in cookery and bakery, storage.
10. Food Adjuncts: Spices, condiments, herbs, extracts; concentrates essences, food colours, origin, classification, description, uses, specifications, procurements and storage.
- AC 11. Convenience Foods: Role, types, advantages, uses, cost and contribution to diet.
- AC 12. Salt: Types and uses.
- AC 13. Beverages: Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices.

FNT-A-CC-3-7-P: FOOD COMMODITIES (PRACTICAL) S-D

2 CREDITS

- SD 1. Detection of starch, sucrose, sucrose, formalin, boric acid, and urea in milk.
2. Detection of urea in puffed rice.
3. Detection of Vanaspati in Ghee/Butter.
4. Detection of Khesari flour in besan.

5. **Detection of Metanil yellow in turmeric/coloured sweet products.**
6. **Detection of Argemone oil in edible oil.**
7. **Detection of artificially colour / foreign matter in tea (dust/leaves).**

FIFTH SEMESTER

[TOTAL CREDITS: 6 (THEORY-4, PRACTICAL-2)]

FNT-A-CC-5-11-Th: DIET THERAPY-II

4 CREDITS

- AC
1. Energy modifications and nutritional care for weight management: Assessment, etiology, complications, prevention and treatment of obesity and underweight.
 - SM 2. Diet in disease of the endocrine pancreas: Diabetes Mellitus: Classification, symptoms, diagnosis, management -insulin therapy, oral hypoglycaemic agents, glucose monitoring at home, dietary care and nutrition therapy, meal plan (with and without insulin), special diabetic foods and artificial sweeteners.
 - SD 3. Hypertension: classification, aetiology, symptoms and dietary management.
Diseases of the cardiovascular system: Definition of infarct, ischemia, angina pectoris, myocardial infarction, heart attack and stroke.
Atherosclerosis and hyperlipidaemias – classification, symptoms, dietary and lifestyle management. Prevention of cardiovascular diseases.
 - SK 4 Renal Diseases: Etiology, symptoms and dietary management of acute and chronic Glomerulonephritis. Nephrotic syndrome - dietary management. Uraemia – dietary

FNT-A-CC-5-11-P: DIET THERAPY-II (PRACTICAL)

2 CREDITS

Planning and preparation of Diets for the following diseases:

ACASK

- i) Obesity and Underweight
- ii) Diabetes mellitus
- iii) Hypertension and Atherosclerosis
- iv) Acute and chronic glomerulonephritis

SK

FNT-A-CC-5-12-Th: NUTRITIONAL BIOCHEMISTRY-II

4 CREDITS

1. Brief Introduction of biological membranes to understand molecular transport, Transport of Large molecules, Receptor mediated endocytosis, exocytosis, Molecular aspects of transport; Passive diffusion, facilitated diffusion, active transport.
SR
2. Introduction to Nucleic acids: Structure, replication, transcription, genetic code (in brief) elementary knowledge of biosynthesis of proteins.
3. Proteins: General reaction of amino acid metabolism, urea cycle. Lipoproteins: Types, composition, role and significance in disease(in brief).
TP
4. Vitamins: Chemistry and biochemical role of fat soluble vitamins. A. D. E. and K. Water soluble vitamins – B1, B2, B6 niacin and C.
5. Minerals: Biochemical role of inorganic elements.
SR

FNT-A-CC-5-12-P: NUTRITIONAL BIOCHEMISTRY-II (PRACTICAL) 2 CREDITS

SR +

TP

1. Qualitative analysis of amino acids
2. Qualitative analysis of proteins
3. Estimation of serum Protein
4. Estimation of serum creatinine
5. Estimation of serum Urea
6. Estimation of serum Iron, phosphorus, calcium