BACHELOR OF SCIENCE (B.Sc.)

(THREE YEAR DEGREE COURSE)

SUBJECT

CLINICAL NUTRITION & DIETETICS
B.Sc.(CLINICAL NUTRITION & DIETETICS)

COURSE STRUCTURE

FIRST YEAR
PAPER – 101: Basic Nutrition & Food Micro Biology 75 MARKS

PAPER – 102: Human Physiology & Nutritional Biochemistry 75 MARKS

PAPER – 103: PRACTICAL 50 MARKS

SECOND YEAR
PAPER – 201: Food commodities, Meal Management & Basic Dietetics 75 MARKS

PAPER – 202: Sanitation and Hygiene, Personnel Management And Quantity Food Production & Service 75 MARKS

PAPER – 203: PRACTICAL 50 MARKS

THIRD YEAR
PAPER – 301: Food Service Equipment Layout & Community Nutrition 75 MARKS

PAPER – 302: Advanced Dietetics & Clinical Nutrition 75 MARKS

PAPER – 303: PRACTICAL 50 MARKS
B.Sc.(CLINICAL NUTRITION & DIETETICS)
FIRST YEAR DETAILED SYALLBUS

PAPER – 101

BASIC NUTRITION & FOOD MICRO BIOLOGY

UNIT I
1. Definition of nutrition, definition of nutrients, food, functions of food, definition of good nutrition, malnutrition.
2. Inter-relationship between nutrition & good health, characteristics of well nourished persons, difference between a people provided with good nutrition & malfunction.
3. Basic five food groups – carbohydrates, proteins, lipids, minerals & vitamins, water.

UNIT II
1. Energy – Unit of energy, food as a source of energy, energy volume of carbohydrates, proteins and lipids, basal metabolism.
2. Carbohydrates – composition, classification (monosaccharide, oligosaccharides, polysaccharides), RDA, food sources, functions of carbohydrates, storage in body.
3. Fats & Oils – Composition, saturated and unsaturated fatty acids, classification (major types of lipids), sources, functions of fats.
UNIT III


UNIT IV

1. Minerals – Functions, sources, requirement and deficiency of calcium, iron, iodine, fluorine, sodium and potassium.
2. Vitamins – Classification, functions, requirements, sources and deficiency of fat soluble vitamins (vitamins A, vitamins D, vitamins E and vitamins K) and water soluble vitamins (ascorbic acid and vitamins B- complex).

UNIT V

1. Microbiology of different foods – spoilage and contamination – sources, types and effect on the following:-
   b). Sugar & Sugar Products.
   c). Vegetables & Fruits
   e). Fish & other Sea Foods.
f). Eggs & Poultry.
g). Milk & milk Products.
h). Canned Products.

2. Microbial intoxications and infections – sources of contamination of food, toxin production and physiological action. Sources of infection of foods by pathogenic organism – symptoms and method of control.
UNIT I

1. The skeleton – skeleton, definition of axial & appendicular skeleton, endoskeleton, functions of bones, bones of axial & appendicular skeleton.


   Structure of heart & blood flow through the heart, cardiac cycle, pulse, blood pressure systolic & diastolic.

   Different types of anemia, leukemia, varicose veins, artherosclerosis & angina pectoris.

3. Lymphatic system – functions of Lymphatic system, Lymphatic tissues, Lymph nodes, tonsils, spleen, Thymus gland.


   Physiology of external (pulmonary) & internal tissues respiration. Common diseases – TB (tuberculosis), Asthma & cough.

UNIT I

1. Digestive System –
(a) Structure of teeth, structure & functions of tongue, structure of salinary glands, composition & functions of saliva.
(c) Diabetes Millets.
(d) Vomiting, constipation, diarrhea, people ulcer & its treatment & piles.

2. Excretory system – structure & functions of kidney, nephron, parts of nephron & its functions, structures & functions of ureter & urinary bladder, physiology of urine formation, composition of urine, abnormal constituents of urine.
   Diseases – Renel stones, nephrosis, significance of urine examination.

3. Skin - functions of skin, structure of skin, hair, glands (sebaceous gland & soporiferous glands) and nails.
   Disorders – Burns, Detritus.

UNIT III

1. Sense Organs –
   (a) Eye – external structures of eye, anatomy of eyeball, image formation, accommodation & near point vision, physiology of vision, myopia & hypermetropia. Conjunctivitis, cataracts & Trachoma.
   (b) Ear – External ear, middle ear, internal ear, sound waves, physiology of hearing, physiology of equilibrium. Disorders – deafness, vertigo.

2. Muscular system – non straighted, straighted & cardiac muscles. Differences & similarities between these three, mechanism of muscular contraction.

4. Brain and spinal cord, functions of different parts of brain, peripheral nervous system. Automatic – sympathetic and parasympathetic nervous system, nerve impulse, synapse, reflex action and voluntary action.

UNIT IV


2. Structure & function of testis, vas deferens, urethra, penis & prostate gland.

3. Menstruation, puberty, menopause, development of fertilized ovum, placenta, its functions, parturition.

4. Endocrine system –
   (b). Disorders – Pituitary dwarfism, gigantism & acromegaly, Grave’s diseases, Addison’s diseases, cretinism, Cushing’s diseases, diabetes mellitus.

UNIT IV

1. Biological oxidation – electron transport mechanism, NADH, Cytochromes, electron transport chain, energy conservation, high energy phosphate bond, storage and release of high energy phosphate.

Genetic control of metabolism – nucleic acids, structure and replication of DNA and RNA.

Genetic repair mechanism.
2. Major metabolic pathways:-

(a) Carbohydrates metabolism: Digestion, absorption, glucose transport, glycolysis.

(b) Lipid metabolism – digestion, absorption transport, oxidation of fatty, acids, biosynthesis of fatty acids, metabolism of phospholipids, glycolipids and cholesterol.

(c) Amino acid metabolism – digestion, absorption and transport.
B.Sc. (CLINICAL NUTRITION & DIETETICS)
FIRST YEAR DETAILED SYLLABUS

PAPER – 103

PRACTICAL

Based on the Paper – 101 & Paper - 102
B.Sc. (CLINICAL NUTRITION & DIETETICS)  
SECOND YEAR DETAILED SYALLBUS  
PAPER – 201  
FOOD COMMODITIES, MEAL MANAGEMENT & BASIC DIETETICS

UNIT I

2. Milk and milk products – composition, classification, quality processing, storage, spoilage, uses, cost, nutritional aspects of milk curds, butter milk, panner, khoa, cheeses, ice-cream, kulfi and various kinds of processed milk.
3. Eggs – Grade, storage, users, cost and nutritional aspects.

UNIT II

1. Fish, poultry and meat – users, cost and nutritional aspects, storage of fish, poultry & meat.
2. Vegetables & Fruits – Variety, selection, purchase, storage, availability, cost, use and nutritional aspects of raw and processed vegetables and fruits.
4. Fats & Oils – Types and sources of fats and oils (animal and vegetable) uses, cost and nutritional aspects.
UNIT III

1. Leaving aspects – Air, steam, baking powder, fermentation
3. Convenience Foods – role, types, advantages, uses, cost and contribution to diet.

UNIT IV

1. Food guide – basic 5 food group – balanced diet – introduction to meal management.
2. Nutritional requirements and meal planning of:
   (a) Infant.
   (b) Pre-schooler
   (c) School going
   (d) Adolescent
   (e) Adult – Man, Women, Girl, Boy according to work and money matters.
   (f) Geriatrics
3. Nutrition during :
   (a) Pregnancy, its complication.
   (b) Lactation and its importance.
   (c) Wearing foods and their importance.
4. Therapeutic diets
   (a) Diabetes
   (b) Fevers and their classification
   (c) Gastro intestinal disorders.
   (d) Cardiovascular disorders.

5. Routine Hospital diets
   (a) Modification of diet.
   (b) Therapeutic diet adaptation.
   (c) Improvement in hospital diet
   (d) Diets in convalescence.
B.Sc. (CLINICAL NUTRITION & DIETETICS)  
SECOND YEAR DETAILED SYLLabus

PAPER – 202

SANITATION AND HYGIENE, PERSONNEL MANAGEMENT AND 
QUANTITY FOOD PRODUCTION & SERVICE

UNIT I

1. The relationship of micro-organisms to sanitation, role of microbiology –
environmental effects of microbial growth- effects of micro-organisms on food
degradation and food borne illnesses – bacteria, virus, molds, yeasts and
parasites.

2. Other food hazards – chemicals, antibiotics, hormones, metal contamination –
poisonous foods.

3. Food contamination – sources and transmission. Water, air, sewage and soil
reservoirs or infections and ways of spread. Other agents of contamination.
Humans, domestic, animals, vermin birds.

UNIT II

1. Importance of personal hygiene of food handler – habits, clothes, illness,
education of food handler in handling and serving food.

2. Safety in food procurement, preparation, cooking and storage, control of
spoilage, safety of left over.

3. Cleaning measures, sterilization, disinfection – products and methods – use of
detergents and soaps for sanitizer strength.

4. Kitchen design equipment and layout.
5. Structure and layout of food premises maintaining clean environment.

UNIT III

1. Waste product handling.
2. Disposal of refuse.
4. Food sanitation, control and inspection - planning and implementation of training programme for health personnel.

UNIT IV

1. Food material management –
   (a) Meaning, definition, importance.
   (b) Food selection, purchasing, receiving and store room management.
   (c) Control in relation to the above operations (material planning, budgeting, material identification and standardization, inventory control, store – keeping, definition, objectives, functions, factors underlying successful storekeeping duties and responsibilities of a store keeper, purchasing, principles, procedure.
2. Visits to different types of food service institutions to study the following: store, hospitals, flight kitchens, hotel restaurants, canteen (industrial).
   (a) Organization.
   (b) Physical plan and layout
   (c) Food service equipment.
(d) Sanitation and hygiene.

UNIT V

1. Meal planning menus served for Indian (regional i.e. North Indian, South Indian, West India and East India, Western and others). Techniques of writing menus (give exercise for planning menus).

2. Types of meals and styles of service, breakfast, launch, dinner, afternoon tea, snacks (table d hote and a’la Carte menu).

3. Introduction to basic and special equipment for food production and services

   (a) indicate and list

   (b) care and use of equipments – silver, cutlery, glass laying up for number (particles, use AV aids and handouts).

4. Staff organization of different outlets (a la carte and table of hote) manager, hostess, supervisor, steward, waiter.

5. Beverages, alcoholic and non alcoholic, hot and cold, classification of beverages, use and importance in meals and snacks, suitable glassware for beverages services.
B.Sc. (CLINICAL NUTRITION & DIETETICS)
SECOND YEAR DETAILED SYLLabus

PAPER – 203
PRACTICAL

Based on the Paper – 201 & Paper - 202
B.Sc. (CLINICAL NUTRITION & DIETETICS)
THIRD YEAR DETAILED SYLLABUS

PAPER – 301

FOOD SERVICE EQUIPMENT LAYOUT & COMMUNITY NUTRITION

UNIT I

1. Equipment in Food Service
   (a) Classification of equipment – Electrical equipment, oven with grill, fridge, dish washer, mixer, grinder. Non-electrical equipments – Mixer, grinder, cooker, vessels of different types.
   (b) Basic concept, safety consideration, writing installation, insulation material used and precaution of all types of gadgets.

2. Planning of Food service units: layout of kitchens, cooking, cleaning, storage of perishables and non-perishables, lighting arrangement and sizes of working place.

UNIT II


2. Role of Nutrition and health in National development.
   National and International agencies in community nutrition: ICDS, SNP, ANP, midday meal programme, FAQ, WHO, UNICEF, CARE, AID, ICMR, ICAR, CSIR, NIN, CFTRI.

3. Food Adulteration.
4. Diet Surveys of different income groups.

UNIT III

1. Methods of assessment of nutritional status:
   (a) Sampling Techniques.
   (b) Direct Assessment
   (c) Indirect Assessment
   (d) Anthropometry
   (e) Clinical and Biochemical estimation
   (f) Growth charts

2. Nutrition intervention schemes in the community, nutrition exhibitions and visual aids.

3. Recent advances in community nutrition, enrichment of food.

UNIT IV


2. Importance of correct and timely weaning.


4. Carbohydrates, their digestion, absorption, metabolism and functions.

5. Lipids – their digestion, absorption, assimilation, functions and production of ketone bodies.

UNIT V

1. Energy metabolism – BMR energy requirement for physical activities.

   Influence of exercise on body. Intensity and duration.

UNIT I


2. Role of Dietitian – Definition of nutritional care, interpersonal relationship with patient, planning and implementing dietary care, team approach to nutritional care.

3. Routine Hospital Diets - Preoperative and post operative diets, study and review of hospital diet, basic concepts and methods of (i) oral feeding, (ii) tube feeding, (iii) parental nutrition, (iv) intravenous feeding.

4. Diet in surgical conditions, burns and cancer.

-unit II

1. Diet in fevers and infections – types, metabolism in fevers, general dietary considerations, diet in influenza, typhoid fever, recurrent malaria and tuberculosis.

2. Diet in gastritis, peptic ulcer (gastric and duodenal) etiology, symptoms and clinical findings, treatment, dietary modifications, adequate nutrition, amount
of food, intervals of feeding. A four stage diet (liquid soft convalescent – liberalized diet).

3. Diet in disturbances of the small intestine and colon – diarrhea (child & adult), classification, modification of diet, fiber, residue, fluids, nutritional adequacy.


UNIT III

1. Diet in disease of the liver and gall bladder and pancreas – etiology, symptoms and dietary treatment in jaundice, hepatitis, cirrhosis of liver and hepatic coma.
   Role of alcohol in liver disease.
   Dietary treatment in cholecystitis and choleliithasis an dpancreatitis.

2. Diet in Diabetes Mellitus –
   Incidence and predisposing factors.
   Symptoms, types and tests for detection.
   Metabolism in diabetes.
   Dietary treatment and mental management.
   Hypoglycemic agents, insulin & its types.
   Complications of diabetes.


UNIT IV

1. Diet in Allergy and skin distribution – definition, classification, manifestations, common food allergies, tests and dietetic treatment.
2. Nutrition & diet counseling – nutritional assessment of patients, dietary prescription and counseling follow up, patient education and diet.

3. To be familiar with the dietary / behavior modifications based on physiological changes occurring in disease conditions. To acquire knowledge regarding affects of various diseases on nutritional status and nutrient requirement.

UNIT V

1. Disease of the Gastro-intestinal tract – effect on digestion, absorption and nutritional status, Diarrhea, Constipation, Gastritis and Ulcers, Colitis, Malabsorption syndromes.


3. Role of specific nutrients – Clinical findings related to nutritional care, Hypertension, Atherosclerosis.
B.Sc. (CLINICAL NUTRITION & DIETETICS)
THIRD YEAR DETAILED SYLLABUS

PAPER – 303

PRACTICAL

Based on the Paper – 301 & Paper - 302