Guide paper - 1

Guide Paper **Paper Code 18MPCNDC03.1**

PERIYAR UNIVERSITY, SALEM

Department of Nutrition and Dietetics

M.Phil SYLLABUS

ADVANCED MEDICAL NUTRITION THERAPY

Objectives:

- To discuss the key elements of nutritional assessment and diet therapy, describe their alterations during various disease states and relate this information to support nutrition intervention strategies in individuals during altered pathological states.
- To interpret information from medical, social and nutritional histories, combined with biochemical and anthropometrical indices during different pathophysiological states to assess nutritional status, develop nutrition care plans and solve nutritional problems of special groups- pediatrics and geriatrics.

UNITS	Topic Details
UNIT-I	**Introduction to Medical Nutrition Therapy** a) Medical Nutrition Therapy –Definition, Significance. b) Dieticians – Definition, Types and Role in health care. c) Nutrition Care Process- Nutrition assessment, Nutrition diagnosis, Nutrition intervention, and Nutrition monitoring and evaluation, Documentation. d) Therapeutic diets- Types of dietary adaptations for therapeutic Needs, Normal Nutrition: A base of therapeutic diet, diet prescription, constructing therapeutic diets, routine hospital diets, feeding techniques. e) Nutrient and Drug Interaction- Basic concepts, effect of nutrition on drugs, drug effects on nutritional status, drug and drug interaction, clinical significance and risk factors for drug-nutrient interactions, guidelines to lower risk and wise use of drugs.
UNIT –II	**Medical Nutrition Therapy during Stress** a) The stress response – Definition, Different phases. b) Surgery - Physiological response to surgery, stages of convalescence, pre-operative nutrition care and post-operative nutrition care. c) Burns -Classification, complications, dietary management, mode of feeding-nutrition support, non-dietary treatment of bums. d) Trauma – Physiological, metabolic, hormonal responses to injury, dietary management. e) Sepsis-Systemic metabolic responses, catabolic responses, dietary management of sepsis with or without MODS.
UNIT- III	**Medical Nutrition Therapy in Pediatric Specific Diseases** a) Assessment of nutritional status in children using appropriate tools and markers, Identify specific pediatric nutritional concerns. b) Nutrients requirements in well and diseased children. Failure to thrive – Definition, causes and the criteria for diagnosis.

	c) Pediatric Specific Disease - Pediatric obesity - Health risks associated with pediatric obesity, the role of medical nutrition therapy and the various levels of management of pediatric obesity. d) Cystic Fibrosis -Definition and its manifestations, nutritional management of the cystic fibrosis throughout the life cycle. e) Low Birth Weight Infants - Define prematurity and classifications of low birth weight. Describe the nutritional needs and unique challenges faced by premature and low birth weight infants.
UNIT- IV	**Medical Nutrition Therapy in Geriatric Disease State** a) Physical and Physiological Changes in old age b) Nutritional Changes and Requirement and Nutritional Assessment c) Health and Feeding Problems among Elderly d) Nutritional management of common geriatric disorders – osteoporosis, osteomalacia, Parkinson's disease and Alzheimer's disease e) Nutrition and oral health - common oral problems, interrelationship between nutrition / nutritional status and oral health.
UNIT- V	**Medical Nutrition Therapy in Inborn Errors of Metabolism and Gene Regulation** a) Phenylketonuria, Tyrosinemia, Maple Syrup Urine Disease, Homocystinuria, Galactosemia- Etiopathology, Clinical features and complications, Role of diet. b) Gene Expression - An Overview. c) Nutrigenomics- Role of Specific Nutrients in Controlling Gene Expression – Proteins, Lipids, Fuel Molecules and Lipogenesis, Minerals, Vitamins.

References

- Kane and Prelack, Advanced Medical Nutrition Therapy, Jones and Bartlett Learning, 2019.
- Antia F.P. And Philip Abraham-Clinical Nutrition and Dietetics, 2001, Oxford Publishing Company.
- Swaminathan S- Advanced Textbook On Food & Nutrition, 2015, Bappco
- B. Srilakshmi- Dietetics, 2019, 8th Edn, New Age International Pvt. Ltd. New Delhi.
- Mahan L.K., Sylvia Escott-Stump - Krause's Food Nutrition and Diet Therapy 10th Edition, 2001,W.B. Saunders Company London.
- Passmore P. And M.A. East Wood - Human Nutrition and Dietetics, Churchill Living Stone.
- Raheena M. Begum - A Text Book of Foods Nutrition and Dietetics , 3 edition 2009,Sterling Publishers Pvt. Ltd
- Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick: Normal And Therapeutic Nutrition, 17 th Edn, Macmillan Publishing Company.
- Shills and Young- Modern Nutrition In Health And Disease, 2012, Lippincott Williams and Wilkins.

Guide paper – 2

Guide Paper **Paper Code 18MPCNDC03.2**

M.Phil SYLLABUS

ADVANCED COMMUNITY NUTRITION

Objectives

- To understand the importance of nutritional status and assessment of nutritional status.
- To describe the measures to overcome food and nutritional problems.
- To enlighten on the organisations involved in promoting nutrition.

UNITS	Topic Details
UNIT-I	**Introduction to Community Nutrition** a) Community Nutrition- Definition, Concepts, Scope, Future Projections. Community- Characteristics, Types. b) Family- Characteristics, Features, Types, Functions. c) Health Care- Concept, Levels, Health care delivery, Role of community nutritionist in health care delivery, Factors affecting community health. d) Malnutrition- Types, Aetiology, Prevalence, Consequence, Impact on national development, Indicators, Prevention.
UNIT –II	**Assessment of Nutritional Status** a) Nutritional Status and Nutritional Assessment- Definition, Need, Goals, Aims and Objectives, Methods of Assessment. b) Direct Methods- Anthropometry, Biochemical, Biophysical, Clinical, Dietary Assessment, Functional Assessment. c) Indirect Methods -Vital Health statistics, Ecological Factors Assessment.
UNIT- III	**Strategies to Combat Community Nutrition Problems** a) Integrated Approaches to Combat Malnutrition - Agriculture Planning, Role of Food Technology, Food fortification and enrichment, Environmental Sanitation and Health. b) Food and Nutrition Security – Definition, Determinants, Framework for assessment, Key to food and nutrition security, Factors underlying the current status of food and nutrition security, Food security system in India. c) Nutrition Intervention Programmes- Objectives and Operation of ICDS, Nutrient Deficiency Control Programmes, Food Supplementation Programmes, Food Security Programmes.
UNIT- IV	**Agencies and Organisations to Combat Malnutrition** a) National organizations - ICMR, NIN, NNMB, ICAR, CFTRI, NIPCCD, CSWB, SSWB, National nutrition strategy. b) International organizations - FAO, WHO, UNICEF UNESCO, CARE, AFPRO, World Bank. c) Voluntary Non-Governmental agencies - Action against Hunger, Feed the Children, World Food Programme, Smile foundation, Tuberculosis Association of India
UNIT- V	**Nutrition Education** a) Nutrition Education- Nature and Importance to the Community, Objectives, Training Workers in Nutrition Education, and Extension Work.

	b) Principles of Planning, Executing and Evaluating Nutrition Education Programmes. c) Problems of Nutrition Education Programmes and Approaches to overcome.

References

- Suryatapadas, 2018, Textbook of Community Nutrition, 3rd Edition, Academic Publishers, West Bengal.
- Prabha Bisht, 2017, Community Nutrition in India, Star Publications, Agra.
- Srilakshmi.B, 2016, Nutrition Science, New Age International Publishers, New Delhi.
- Swaminathan.M, Essentials of Food and Nutrition, Bangalore Publishing Ltd. Bangalore.
- Park A., Textbook of Preventive and Social Medicine, Twenty Third edition, 2015, Bhanot.
- Gibney MJ - Public Health Nutrition, 2nd Edn, John Wiley &Sons.
- Jellife D.B- Assessment of Nutrition Status of the Community, 1966, WHO, Geneva.

Guide Paper - 3

Guide Paper **Paper Code 18MPCNDC03.3**

M.Phil SYLLABUS

ADVANCED NUTRACEUTICALS AND FUNCTIONAL FOODS

Objectives

- To provide an understanding on the health promoting nutritional factors and bioactive constituents present in foods.
- To widen the knowledge of the potential health implications of functional foods and mechanisms of action of nutraceuticals on humans.

UNITS	Topic Details
UNIT-I	**Introduction to Nutraceuticals and Functional Foods** a) Nutraceuticals and Functional Foods - Definition, History and Classification. b) Perceived Effects of Functional Foods in Disease Prevention. c) Probiotics, Prebiotics and Synbiotics- Definition, Characteristics, Mechanism of action.
UNIT –II	**Probiotics and Prebiotics** a) Probiotics Microorganisms- Taxonomy and important features of probiotic microorganism- Lactobacillus, Bifidobacterium. b) Probiotics -Sources, Health benefits, Quality assurance of probiotics and safety. c) Prebiotics- Oligosaccharides, Dietary Fibre, Resistant starch, Gums - Classification, Functions.
UNIT- III	**Pigments as Nutraceuticals** a) Carotenoids- Chemistry, Classification, Structure and Health benefits. b) Lycopene- Structure, Sources, Metabolism of action, Health benefits, Commercial products of lycopene. c) Anthocyanins and Anthoxanthins- Structure, Sources, Functions. d) Curcumin- Structure, Sources, Metabolism of action, Effect of processing, Health benefits, Commercial products of Curcumin.
UNIT- IV	**Polyphenols** a) Flavonoids- Classification, Structure, Sources, Effects of processing, Health benefits. b) Tannins- Definition, Types, Structure, Metabolism, Effects of processing, Health benefits. c) Catechins - Classification, Structure, Sources, Effects of processing, Health benefits. d) Resveratrol – Chemistry, Sources, Effects of processing, Metabolism and bioavailability, Health benefits, Perspective of food application of resveratrol.
UNIT- V	**Nutraceuticals in Spices and Condiments** a) Cinnamaldehyde, Crocin and Luteolin - Chemistry, Sources, Effects of processing, Metabolism and bioavailability, Health benefits, Perspective of food applications.

	b) Organosulphur compounds- Types, Structure, Sources, Effects of processing, beneficial health effects. c) Phytoestrogens and Phytosterols- Classes, Sources, Effects of processing, Health benefits. d) Glucosinolate- Definition, Structure, Sources, Effects of processing, metabolic and health effects.

References

- Mary, K. Schmidl - Essentials of Functional Foods, 2000, Culinary and hospitality industry publication services.
- Robert Easy Wildman - Handbook of Nutraceuticals and Functional Foods, 2001, Culinary and hospitality industry publication services, 2000.
- Chatwick, R - Functional Foods, 2003, Springer.
- Mazza, G. - Functional Foods- Biochemical and processing aspects, 1998, Culinary and hospitality industry publication services.
- Paresh, C. Dutta, Phytosterols as Functional Food Components and Nutraceuticals, 2004, Marcel Dehker Inc, New York.
- Guo M. - Functional Foods – Principles and technology, 2009, Wood head publishing company, UK.

Guide paper - 4

Guide Paper **Paper Code 18MPCNDC03.4**

M.Phil SYLLABUS

MEDICAL NUTRITION THERAPY FOR NON-COMMUNICABLE DISEASES

Objectives

- To understand the etiology, symptoms and complications of Non-Communicable diseases.
- To enable the students to recommend and provide appropriate nutritional care and dietary management for prevention and treatment of the various Non-Communicable diseases.

UNITS	Topic Details
UNIT-I	**Gastro Intestinal Diseases and Disorders** a) Gastritis, Peptic ulcer, Dyspepsia, Esophagitis and Dumping Syndrome, Flatulence, Diarrhea, Dysentery, Constipation, GERD, , Tropical sprue, Diverticular disease, Colon cancer, Ulcerative colitis and Crohn's Disease- a) Etiology b) Signs & symptoms c) Nutritional objectives and Dietary management. b) Malabsorption Syndrome - Celiac disease, Steatorrhea, Inflammatory Bowel Disease, Lactose Intolerance- a) Etiology b) Signs & symptoms c) Nutritional objectives and Dietary management.
UNIT –II	**Liver, Gallbladder and Pancreatic Disorders** a) Viral Hepatitis, Liver Cirrhosis, Hepatic Encephalopathy or Hepatic Coma – Etiology, Signs & symptoms, Nutritional objectives and Dietary management. b) Gall Bladder and Biliary Tract Diseases - Cholecystitis, Cholelithiasis, Acute Cholangitis and Cholestasis -Etiology, Signs & symptoms, Nutritional objectives and Dietary management. c) Pancreatitis and Zollinger- Ellison Syndrome - Etiology, Signs & symptoms, Nutritional objectives and Dietary management. d) Diagnostic tests – Liver function tests, Gall bladder function tests, Pancreatic function tests.
UNIT- III	**Renal Disorders** a) Kidney – Physiology and functions. b) Renal Disorders - Glomerulonephritis, Nephrotic Syndrome, Acute Renal Failure, Chronic Renal Failure, End Stage Renal Disease-Dialysis and Kidney Transplant – Etiology, Clinical Signs and Symptoms, Dietary and Non- Dietary Management c) Nephrolithiasis/Renal Calculi – Aetiology, Types of calculi and nutritional care- acid and alkaline ash diet, Use of sodium, potassium and phosphorus exchange lists in diet planning of kidney diseases patient. d) Renal function tests.
UNIT- IV	**Cancer** a) Cancer – Development, Characteristics, Identification, Types. b) Etiology – Genetic, Environmental, Dietary, Non-Dietary, Stress factors, Clinical manifestations and Nutritional problems associated with cancer.

	c) Nutritional requirement, Dietary management of cancer patients, Feeding problems associated with cancer therapy. d) Cancer Prevention – Guidelines, Recent research findings related to cancer prevention, Role of antioxidants.
UNIT- V	**Arthritis and Gout** a) Arthritis – Types, Causes, Symptoms, Diagnosis, Dietary management- Anti-inflammatory diet. b) Gout – Etiopathology, Role of Protein and Purines, Clinical Features and Complications, Dietary Management of Gout.

References

- Kane and Prelack, Advanced Medical Nutrition Therapy, Jones and Bartlett Learning, 2019.
- Antia F.P. And Philip Abraham-Clinical Nutrition and Dietetics, 2001, Oxford Publishing Company.
- Swaminathan S- Advanced Textbook On Food & Nutrition, 2015, Bappco
- B. Srilakshmi- Dietetics, 2019, 8th Edn, New Age International Pvt. Ltd. New Delhi.
- Mahan L.K., Sylvia Escott-Stump - Krause's Food Nutrition and Diet Therapy 10th Edition, 2001,W.B. Saunders Company London.
- Passmore P. And M.A. East Wood - Human Nutrition and Dietetics, Churchill Living Stone.
- Raheena M. Begum - A Text Book of Foods Nutrition and Dietetics , 3 edition 2009,Sterling Publishers Pvt. Ltd
- Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick: Normal And Therapeutic Nutrition,17 th Edn, Macmillan Publishing Company.
- Shills and Young- Modern Nutrition In Health And Disease, 2012, Lippincott Williams and Wilkins.

Guide paper - 5

Guide Paper **Paper Code 18MPCNDC03.5**

M.Phil SYLLABUS

BAKERY TECHNOLOGY AND FOOD QUALITY CONTROL

Objectives:

- To enable students to understand the concepts of food processing in snack production.
- To develop skill in innovation of healthy bakery foods production.
- To enlighten on the basics of food safety and quality control.

UNITS	Topic Details
UNIT-I	**Breads, Buns and Pizza Base** a) Ingredients & processes. b) Stages in processing bread- Weighing, mixing fermentation, Knock-back, Dividing & Rounding, Intermediate proofing, Moulding & Panning, Final Proofing, Baking, Booking, Slicing, Packaging. c) Bread making Method and their advantages and disadvantages- Straight dough method, Salt delayed method, no time dough method, Ferment & dough method, Continuous bread making process, Chorleywood process. d) Characteristics of good bread.
UNIT –II	**Biscuits, Cookies, Crackers & Cakes** a) Biscuits, Cookies, Crackers -Ingredients & processes, equipment's used, product quality characteristics, faults and corrective measures. b) Cakes - Ingredients & processes for cakes, Equipment's used, product quality characteristics, faults and corrective measures. Different types of icings. c) Modified Bakery Products - Modification of bakery products for people with special nutritional requirements e.g. high fibre, low sugar, low fat, gluten free bakery products. d) Impact of bakery products on health, Nutritional importance of modified bakery products.
UNIT- III	**Grain based Snack** a) Whole grains- roasted, toasted, puffed, popped and flakes. b) Coated grains- salted, spiced and sweetened. c) Flour based- batter and dough based products.
UNIT- IV	**Fruit and Vegetable based Snacks** a) Chips, wafers, technology for coated nuts - salted, spiced. b) Sweetened- chikkis, manufacturing technology of extruded snack foods. c) Basic principle of unit operations such as frying, baking and drying, toasting, roasting and flaking, popping, blending, coating, chipping in snack food processing industries.
UNIT- V	**Food Safety and Quality Control** a) Definition of Quality Assurance (QA), Difference between Quality Assurance and Quality Control, Definition of Total Quality Control, its nature, approaches and role of management, Definition of Statistical

	Quality control (SQC), determining the need for SQC, Definition – control chart, uses process control. b) Hazard Analysis Critical Control Point (HACCP): History, structure, pre- requites and HACCP applications, HACCP based SOPs. c) Principles, Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP), Good Agricultural Practice (GAP), Good Veterinary Practice (GVP). d) Storage and distribution of food, sanitation and safety in food services.

References

- Dubey, S.C. (2007). Basic Baking 5th Ed. Chanakya Mudrak Pvt. Ltd.
- Raina et.al. (2003). Basic Food Preparation-A Complete Manual. 3rd Ed. Orient Longman Pvt. Ltd.
- Manay, S. & Shadaksharaswami, M. (2004). Foods: Facts and Principles, New Age Publishers.
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Guide paper - 6

Guide Paper **Paper Code 18MPCNDC03.6**

M.Phil SYLLABUS

PERISHABLE AND NON-PERISHABLE FOOD TECHNOLOGY

Objectives

- To understand and develop technological knowledge in perishable food products.
- To comprehend the concepts of processing non-perishables foods.

UNITS	Topic Details
UNIT-I	**Technology of Milk and Egg Processing** a) Sources and composition of milk, processing of market milk, Standardization, toning, homogenization, pasteurization, sterilization, storage, packaging, transportation and distribution of milk. b) Processed milk products - Cream, butter, ghee, cheese, condensed milk, evaporated milk, whole and skimmed milk powder, ice cream, khoa, channa, paneer, Judging and grading of milk and its products. c) Egg Processing Technology -Structure and composition-nutritive value and functional properties of eggs. d) Factors affecting egg quality and measures of egg quality. Recent development in eggs processing.
UNIT –II	**Technology of Meat and Fish Processing** a) Meat -Sources and types of meat, meat products in India, its importance in national economy, Recent trends in meat processing. b) Slaughtering of animals and poultry, inspection and grading of meat, Factors affecting post-mortem changes, properties and shelf-life of meat. c) Fish- Types of fish, composition, structure and post-mortem changes in fish. d) Fish protein concentrates (FPC), fish protein extracts (FPE), fish protein hydrolysis (FPH).
UNIT- III	**Fruit and Vegetable Processing Technology** a) Principle and methods of Fruit and Vegetable processing Technology-Composition and related quality factors for processing. b) Principles of storage of fruits and vegetables. c) Types of storage- Natural, ventilated low temperature storage, Controlled Atmosphere and Modified Atmosphere storages, Fruit product order and quality control.
UNIT- IV	**Cereals and Millets** a) Wheat - Structure and nutrient distribution, types, milling of wheat, quality of flour and flour treatment. b) Rice – Structure and nutritive value, milling-parboiling of rice, effect of aging of rice, rice products-enrichment with vitamin and minerals, by product utilization,Production and quality of breakfast cereals, macaroni products and malt. c) Millets - Introduction to millets, new varieties, production trends of - barley, oat, corn, sorghum, pearl millet and foxtail millet-Chemical constituents-processing, d) Pearling and malting of millets, wet and dry milling, germ oil, Preparation of extruded products and their derivatives.

UNIT- V	**Pulses and Oil Seeds** a) Pulses- composition, importance in Indian diet, Types of pulses and legumes, principles of pulse milling, different methods of dhal milling, milling of major legumes. b) Uses of by products, recent development in pulse technology. c) Oilseeds- Types, Importance of fats and oils in human nutrition, Chemical, physical and functional properties of fats and oils, suitability of oil seeds for processing, importance of oil seeds processing in India. **d)** Preparation of protein concentrates and isolates and their use in high protein foods, Fermented and traditional products from oil seeds.

References

- Srilakshmi B. - Food Science, 7th edn, 2018, New Age International (P) Ltd. Publishers,
- Swaminathan.A - Food Science And Experimental Foods, 1979, Ganesh Publishers.
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Guide Paper - 7

Guide Paper **Paper Code 18MPCNDC03.7**

M.Phil SYLLABUS

THERAPEUTIC DIET FOR CARDIOVASCULAR DISEASE

Objectives

- To impart knowledge and understanding in the area of cardiovascular diseases.
- To study the etiology, symptoms and medical nutrition therapy in various diseases.
- To develop students to become health care professionals for services in various fields of clinical nutrition and related areas such as hospitals, academics, research, industry, community service.
- To develop capacities and abilities and enable them to pursue research in Clinical Nutrition and Food Science.

UNITS	Topic Details
UNIT-I	**Introduction to Heart** a) Cardiovascular System - Structure of heart, conducting system of heart, heart rate and regulation, cardiac cycle, b) Blood –Functions, composition, blood clotting, blood groups, blood vessels-artery, vein capillaries, blood circulation-greater, lesser.
UNIT –II	**Dietary management of Hypo and Hypertension** a) Dietary management of Hypotension and Hypertension i) Definition, Classification and Cause ii) Signs & Symptoms and Complications iii) Dietary management -Diet related factors influencing hypertension, DASH diet - Lifestyle modification b) Hypertension – Level of sodium restriction diet, dangers of severe sodium restriction.
UNIT- III	**Diet in Cardiovascular diseases** a) Diet in Cardiovascular diseases: Aetiology, Symptoms, Risk factors, pathophysiology, dietary management and prevention of Dyslipidemia, Atherosclerosis, Angina pectoris, Coronary Artery Disease, Myocardial Infarction, Ischemic Heart Disease, Rheumatic Heart Disease (RHD), Congestive Cardiac Failure (CCF), Hypercholesterolemia. b) Prevention through life style modifications c) Dietary management - Low fat, low cholesterol and medium chain triglyceride diet -Role of nutraceutical and functional foods in the prevention of cardiovascular diseases.
UNIT- IV	**Lipids and its interrelationship with cardiovascular diseases** a) Lipids and their Metabolism – Classification, sources, functions and metabolism. b) Digestion and absorption, Deposition and storage of lipids. c) Role of essential fatty acids and Lipoproteins, Role of Triglycerides and Cholesterol d) Oxidation of fatty acids, Synthesis of fatty acids, Biosynthesis of triglycerides and phosphatides.

UNIT- V	**Treatment and management of cardiovascular diseases** a) Treatment - Drugs like Anti -hypertensive, Diuretics, lipid lowering drugs. b) Management – Nutrition education and counselling, physical exercise, yoga and meditation, stress management.

References

- Antia F.P and Abraham Philip (1998), Clinical Nutrition and Dietetics, 4th edition, Oxford Publishers.
- Chatterjee C.C. (2003), Human Physiology, Kalyani Mukherjee Publishers, Kolkata.
- Garrow J.S., James W.P.T. and Ralph A (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingstone.
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- Robinson C.H., Rawler M.R., Chenoweth W.L., Garwich A.E (1986) Normal and Therapeutic Nutrition, 17th edition, Mac Millan Publiushing Co, New York.
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Guide paper - 8

Guide Paper **Paper Code 18MPCNDC03.8**

M.Phil SYLLABUS

THERAPEUTIC DIET FOR DIABETES MELLITUS

Objectives

- To impart knowledge and understanding in the area of Diabetes mellitus.
- To study the etiology, symptoms and medical nutrition therapy in diabetes mellitus.
- To develop capacities and abilities and enable them to pursue research in Clinical Nutrition and Food Science.

UNITS	Topic Details
UNIT-I	**Diabetes mellitus** a) Prevalence, Types, Etiology and Signs and Symptoms b) Factors affecting normal blood glucose levels c) Impaired glucose homeostasis d) Diagnostic test for diabetes
UNIT –II	**Dietary Management of Diabetes** a) Food exchange list, b) Glycemic index of foods, Carbohydrate counting and Resistant starch c) Sweeteners and sugar substitutes d) Meal planning approaches - With and without Insulin and during sickness. e) Role of nutraceutical and functional foods in the prevention of Diabetes mellitus.
UNIT- III	**Management of Hypoglycemia** a) Types, symptoms and fasting state hypoglycemia b) Postprandial or reactive hypoglycemia. c) Dietary treatment in reactive hypoglycemia.
UNIT- IV	**Long term complications:** a) Macro vascular complication: It includes coronary artery disease, cerebral vascular and peripheral vascular disease – type, risk factors and intervention strategies. b) Micro vascular complication: Diabetes Eye disease, Neuropathy, Nephropathy – Disease stage, diagnosis and treatment. Other complications (foot, skin, gastrointestinal disorders, endocrine disease, psychological factors, etc.)
UNIT- V	**Treatment and Management of Diabetes Mellitus** a) Medications- Oral hypoglycemic drugs and Insulin. b) Lifestyle modification and exercise to manage diabetes mellitus. c) Practical management of Diabetes: Dietary management, insulin and oral therapy, Avoiding and managing hypo and hyperglycemia, Self- management strategies during special situations (sick days, travel, hypoglycemic events), Newer trends in management. d) Special considerations: Diabetes in children and adolescents, Diabetes in pregnancy, Diabetes in the elderly, Diabetes & infection, Diabetes in people living in poverty, surgical considerations in Diabetes.

References

- Antia F.P and Abraham Philip (1998), Clinical Nutrition and Dietetics, 4th edition, Oxford Publishers.
- Chatterjee C.C. (2003), Human Physiology, Kalyani Mukherjee Publishers, Kolkata.
- Garrow J.S., James W.P.T. and Ralph A (2000), Human Nutrition and Dietetics, 10th edition, Churchill Livingstone.
- Robinson C.H., Rawler M.R., Chenoweth W.L., Garwich A.E (1986) Normal and Therapeutic Nutrition, 17th edition, Mac Millan Publiushing Co, New York.
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