LESSON PLAN FOR BOTH ODD & EVEN SEMESTERS

FOOD & NUTRITION – HONOURS

SEMESTER I

PAPER	TOPIC	SUBTOPICS	HOURS	FACULTY
DSC/ CORE (Major)- C1: TH	Basic Food Science	1. Basic concept of Food, Nutrition and Nutrients. Classification of Food, Classification of Nutrients.	2	AC
		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.	6	SM+AC
		3. 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-3fatty acid.	4	SD
		4. 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.	4	SK

		5.Dietary Fibre- Classification, sources, composition, properties & nutritional significance	2	AH
DSC/Core (Major)C1-P	BASIC FOOD SCIENCE -I (PRACTICAL)	Identification of Mono, Di and polysaccharides	4	TP+SR
		Identification of Proteins	2	TP+SR
		Identification of glycerol	2	TP+SR
SEC 1-TH	NUTRITION AND HEALTH EDUCATION	1. Concept, objectives and importance of nutrition and health education.	2	SD
		2. Principles of health education	2	SD
		3. Nutrition Educators' - criteria. Target groups for Nutrition and Health education: Infants, preschooler, school children, adults, and elderly	4	AC
		4. Nutrition and health education communication process.	2	AC
		5. Steps in planning health and nutrition education.	2	SM
		6. Channels for nutrition education in the community	2	SM
		7. Methods involved in nutrition and health education	2	AH
		8. Evaluation of nutrition and health education programmes	2	AH
SEMESTER II				
DSC/Core (Major) C-2- TH	BASIC FOOD SCIENCE-II	1. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)	6	SD+SM
		2. Vitamins - Biochemical and Physiological role, Bio-availability and requirements, sources, deficiency & excess (Fat soluble and water-soluble vitamins), Provitamin, Antivitamin, Pseudo vitamin and Vitamers.	6	SK+AH
		3. Water - Functions, daily requirements, Effect of excess and deficiency. Water balance.	2	AC

DSC/Core (Major) C-2- P	BASIC FOOD SCIENCE-II (PRACTICAL)	1. Determination of Ash content in food	2	SR+TP
		2. Determination of Moisture content in food	2	SR+TP
		3. Determination of calcium, iron, and Vitamin C content in foods.	6	SR+TP
SEC 2-TH	NUTRITIONAL EPIDEMIOLOGY & PUBLIC HEALTH	1. Definition of Health, Dimension of Health: Positive health versus Absence of disease, Determinants of Health, Indicators of health – Mortality, Morbidity, Disability, Nutritional Status, Health care Delivery, Environmental, Socioeconomics, Health care Policy 2. Epidemiology: Definition, Aims, Tools of Measurement – Rates, Ratios and Proportions. Study designs in epidemiology, Descriptive epidemiology, Analytical epidemiology, Data Collection and sources of data. 3. Secondary Sources of Community Health data: Sources of relevant vital statistics of infant, child & maternal mortality rates, Under-5 mortality, Birth Rate, Crude death rate. 4. Immunization: Importance and National Immunization schedule for children and adults 5. Water and Waste Management: Importance of water to the community, etiology and effects of toxic agents, water borne infectious agents like Viral (Viral hepatitis, rotavirus diarrhea); Bacterial (Bacillary dysentery, Cholera); protozoal (Amoebiasis); Helminthic (Roundworm). Sources of water, safe drinking water, potable water, waste and waste disposal, sewage disposal and treatment, solid waste and disposal, liquid waste disposal. 6. Communicable and infective disease control: Nature of communicable and infectious diseases (Measles, Influenza, Tuberculosis, Dengue, SARS), infection,	18	MB

		contamination disinfections, decontamination, transmission-direct & indirect, vector borne disease (Malaria, Typhoid, Hookworm infestation, Chikungunya fever) infecting organisms and positive agents, environmental agents and epidemiological principles of disease control. 7. Public health hazards due to contaminated foods: Food borne infections (Botulism, Salmonellosis, Shigellosis, Staphylococcal intoxication) and intoxications (Lathyrism, Aflatoxicosis, Mercury poisoning and pesticide residue DDT poisoning): symptoms, mode of transmission and methods of prevention.		
SEMESTER III				
DSC/CORE/ (MAJOR) CC1-3-TH:	HUMAN NUTRITION-I	1. Concept and definition of terms- Nutrition, Malnutrition and Health: Scope of Nutrition.	2	SD
		2. Minimum Nutritional Requirement and RDA: formulation of RDA and Dietary Guidelines Reference Man and Reference Woman, Adult consumption unit.	2	SD
		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.	3	SM
		4. Growth & Development from infancy to adulthood: Somatic, physical, brain and mental development, puberty, menarche, pre-pubertal and pubertal changes, Factors affecting growth and development. Importance of Nutrition for ensuring adequate development.	4	AH+SK
		5. Growth monitoring and promotion: Use of growth charts and standards, Prevention of growth faltering.	2	AH+SK
CC1-3-P	HUMAN NUTRITION-I (PRACTICAL)	1. Process involved in cooking: pressure cooking, microwave, steaming, grilling, deep fat frying.	2	AC+SM

		2. General concepts of weights and measures. Eye estimation of raw and cooked foods.	2	AC+SM
		3. Preparation of food from different food groups and their significance in relation to health.	3	AC+SM
		4. Preparation of supplementary food for different age group and their nutritional significance.	4	AC+SM
		5. Planning and preparation of low-cost diet for Grade I and Grade II malnourished child.	3	AC+SM
DSC/Core (Major) C-4-TH	HUMAN PHYSIOLOGY-I	1. Overview of cell Biology • Structure and functions of animal cell with special reference to Plasma membrane (Fluid Mosaic Model), Mitochondria, Ribosome, Endoplasmic reticulum. • Nucleus (nuclear membrane, nuclear chromatin and nucleolus). 2. Digestive system: • Structure and functions of G.I. tract. • Structure and functions of Stomach, liver, gallbladder and pancreas. • Composition and function: Salivary juice, Gastric juice, Pancreatic juice, Bile juice and Intestinal juice. • Digestion and absorption of carbohydrates, Protein and fats • Gastrointestinal hormones 3. Circulatory and Cardiovascular system: • Blood components, Plasma Protein - Composition and Function, Blood groups • Erythropoiesis and factors controlling erythropoiesis, Mechanism of blood coagulation. • Structure and functions of heart. • Cardiac cycle, cardiac output, Blood pressure and its regulation. Hypertension. 4. Respiratory system: • Structure of Lungs and gaseous exchange (oxygen and carbon dioxide transport), Brief idea on Acclimatization. 5. Musculoskeletal System: • Types and	20	AD

		functions of muscles, bones (osteoclasts and osteoblasts) and teeth (Brief idea). 6. Body composition: • Generalized structural makeup of human body		
DSC/Core (Major) C-4-P	HUMAN PHYSIOLOGY-I (PRACTICAL)	1. The Compound Microscope- parts, function 2. Peak Expiratory Flow Rate (PEFR) using Peak flow meter 3. Cardiac Efficiency test, Effect of Posture, Gravity and Muscular Exercise on Heart Rate 4. Squamous epithelial cells- preparation of film and staining	8	AD
SEC -3-TH	FOOD SERVICE MANAGEMENT	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	12	SK

SEMESTER IV				
DSC/Core (Major)C-5-TH	HUMAN NUTRITION-II	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.	3	AH
		2. Nutrition during Lactation: Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding.	2	SD
		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.	4	AC+SM
		4. Management of preterm and low birth weight babies.	2	SK
		5. Nutritional needs of toddlers, preschool, school going children-and adolescents- Dietary management	3	SK
DSC/Core (Major)C-5-P:	HUMAN NUTRITION-II (PRACTICAL)	Planning and preparation of adequate meal for different age groups with special reference to different physiological conditions: infants, pre-schooler, school	6	AH+SM

		children, adolescents, adults, pregnancy, lactation and old age.		
DSC/Core (Major) C-6-TH	HUMAN PHYSIOLOGY-II	1. Nervous System: • Concept of sympathetic and parasympathetic nervous system. • Brief anatomy and functions of cerebrum, cerebellum, hypothalamus and neuron • Concept on synapse and synaptic transmission 2. Endocrine system: Types of hormones • Location, anatomy, functional morphology and hormones of pituitary, thyroid and adrenal gland. • Structure and functions of pancreas • Functions of parathyroid, hypothalamic hormones 3. 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. 4. Excretory system: • Structure and functions of kidney- structure of nephron. endocrine function of kidney • Physiology of urine formation • Structure and function of skin. • Regulation of temperature of the body.	12	AD
DSC/Core (Major) C-6-P	HUMAN PHYSIOLOGY-II (PRACTICAL)	1. Preparing a Peripheral Blood Film-Staining with Leishman stain, Identification of different types of WBCs 2. Identification of tissues, with two characteristics of each – lungs, small intestine, pancreas, liver, kidney 3. Recording of Systemic Arterial Blood Pressure 4. Effect of Posture, Gravity, and Muscular Exercise on Blood Pressure	8	AD
DSC/Core (Major) C-7-TH:	FOOD COMMODITIES-I	1. Cereals and Millets: Structure, processing, storage, use in various preparation, variety, selection and cost. Cereal products, breakfast cereals, fast food.	3	AC

		2. Pulses and Legumes: Structures, Selection and variety. Storage, Processing and use in different preparations, Nutritional aspects and cost.	2	SD
		3. Milk and Milk products: Composition, Classification, Selection Quality and Cost, Processing, Storage and uses in different preparations, Nutritional aspects, shelf life and spoilage.	3	SM
		4. Eggs: Production, grade, quality selection, storage and spoilage, cost nutritional aspects and use in different preparations.	2	SD
		4. Meat, Fish and Poultry: Types, Selection, Purchase, Storage, Uses, preparations Cost, Spoilage of fish Poultry and meat.	2	AH
		5. Vegetables and Fruits: Variety, Selection, purchase, storage, availability causes and nutritional aspects of raw and processed products and use in different preparations.	3	SK
DSC/Core (Major) C-7-P	FOOD COMMODITIES-I (PRACTICAL)	1. Estimation of gluten content in cereal products. 2. Detection of urea in puffed rice. 3. Detection of Khesari flour in besan. 4. Detection of starch, sucrose, formalin, boric acid, and urea in milk. 5. Effect of acid and alkali on milk proteins 6. Foaming properties of egg 7. Effects of Heat, acid, alkali and metals on pigments of fruits and vegetables 8. Methods to prevent enzymatic browning using salt, sugar, Ascorbic acid, lemon juice in fruits and vegetables	8	SD+SK
DSC/Core (Major) C-8-TH:	NUTRITIONAL BIOCHEMISTRY-I	1. Biomolecules: Types of biomolecules- Carbohydrates, lipids, amino acids, proteins and nucleic acids. Digestion and absorption of biomolecules.	12	SR+TP

		2. Enzymes: Definition, types and classification of enzymes, Types and functions of coenzymes and cofactors, Specificity of enzymes, Isozymes, Enzyme kinetics study including factors affecting enzyme action, Velocity of enzyme catalyzed reactions, Regulations of enzyme activity, Zymogen, Allosteric enzymes, Enzyme inhibition. 3. Carbohydrates and their Metabolism: Classification, structure and physico-chemical properties, Metabolisms of carbohydrates and Energy production: Glycolysis, Citric acid cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, Hexose monophosphate shunt pathway. 4. Lipids and their Metabolism: Classification, structure and physico-chemical properties, Metabolic Oxidation of fatty acids and Energy production, Biosynthesis of fatty acids and ketone bodies, Ketosis and fatty livers, Essential Fatty acids, Cholesterol and its clinical significance.		
DSC/Core (Major) C-8-P:	NUTRITIONAL BIOCHEMISTRY-I (PRACTICAL)	1. Determination of Enzyme activity and study on effect of pH, Temperature and Substrate concentration on Enzyme activity: Amylase 2. Quantitative estimation of Sugars: Glucose, Lactose, Starch 3. Estimation of Acid value, Iodine value, Saponification value of fats 4. Estimation of serum Glucose 5. Estimation of serum Triglyceride, Cholesterol	10	SR+TP
SEMESTER V				
DSC/Core (Major) C-9-TH:	COMMUNITY NUTRITION	1. Concept of Community, types of Community, Factors affecting health of the Community.	2	AC
		2. Nutritional Assessment and	2	SD

		Surveillance: Meaning, need, objectives and importance		
		3. Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods.	2	AH
		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.	2	SK
		5. Clinical Signs: Need & Importance's, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs.	2	SM
		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.	2	SK
		7. International, national, regional agencies and organizations. Nutritional intervention programmes to combat malnutrition.	2	AC
DSC/Core (Major) C-9-P	COMMUNITY NUTRITION (PRACTICAL)	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) | vitamin A deficiencies, Anaemia, Rickets, B-Complex deficiencies.	8	AC+SM

		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. Interpretation of data.		
DSC/Core (Major) C-10-TH	FOOD COMMODITIES-II	1. Sugar and sugar Products: Types of natural sweeteners, manufacture, selection, storage and use as preserves, stages in sugar cookery.	2	AH
		2. Fats and Oils: Types and sources (animal and vegetable), Processing, uses in different preparations, storage, cost and nutritional aspects.	2	SD
		3. Food Adjuncts: Spices, condiments, herbs, extracts; concentrates essences, food colours, origin, classification, description, uses, specifications, procurements and storage.	2	AH
		4. Beverages: Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices.	2	SM
		5. Raising and Leavening agents: Types, constituents, uses in cookery and bakery, storage.	1	AC
		6. Convenience Foods: Role, types, advantages, uses, cost and contribution to diet	1	AC
		7. Salt: Types and uses	1	AC
DSC/Core (Major) C-10-P:	FOOD COMMODITIES-II (PRACTICAL)	1. Estimation of sugars, TSS in Degree Brix 2. Estimation of Total solids in Jams and Jellies 3. Detection of Metanil yellow in coloured sweet products. 4. Detection of Argemone oil in edible oil. 5. Detection of Vanaspati in Ghee/Butter	14	SD+AH

		6. Detection of artificially colour / foreign matter in tea (dust/leaves). 7. Detection of Metanil yellow in turmeric powder. 8. Detection of Adulterants in spices (Cumin seed powder, chilli powder)		
DSC/Core (Major) C-11-TH:	NUTRITIONAL BIOCHEMISTRY-II	1. Transport of Biomolecules: 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. 2. Nucleic acids, Nucleotides and their Metabolisms: Nucleic acids, nucleotides and nucleosides- Classification, structure and functions, Structure of DNA and RNA, Types of RNA and their functions, DNA: replication, transcription and translation, Role of nucleic acids in protein synthesis, elementary knowledge of genetic code. 3. Proteins and amino acids: Classification, structure and physico-chemical properties, General reaction of amino acid metabolism, Urea cycle, Lipoproteins: Types, composition, role and significance in diseases (in brief). 4. Vitamins and Minerals: Chemistry and biochemical role of fat-soluble vitamins (A, D, E, K) and Water-soluble vitamins (B1, B2, B3, B6 and C), Role of Vitamins as antioxidants and cofactors, Biochemical role of minerals in biological system and their importance – Sodium, Potassium, Calcium, Phosphorus, Iron, Iodine, Copper, Zinc, Manganese.	10	TP+SR
DSC/Core (Major) C-11-P	NUTRITIONAL BIOCHEMISTRY-II (PRACTICAL)	1. Qualitative analysis of amino acids 2. Study on the properties of proteins 3. Quantitative estimation protein by Lowry and Biuret methods	10	TP+SR

		4. Estimation of serum Creatinine and Urea 5. Estimation Vitamin C 6. Estimation of serum Calcium, Magnesium, Zinc, Copper		
DSC/Core (Major) C-12-TH	DIET THERAPY-I	1. Basic concepts of diet therapy: Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets.	2	AC
		2. Team approach to health care. Assessment of Patient's needs	1	AC
		3. Routine Hospital Diets: Regular, light, soft, fluid, parenteral and enteral feeding	2	AC
		4. Diets for different febrile conditions: influenza, malaria and typhoid.	2	SD
		5. Etiological factors, symptoms, and management of common diseases of stomach-Gastritis and Peptic ulcer.	4	SD
		6. Etiology, symptoms, and management of intestinal diseases: Diarrhoea, steatorrhoea, Diverticular disease, inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, Irritable Bowel Syndrome.	4	SM
		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.	3	AH
		8. Anemia: General concept, aetiology, classification, and dietary management of Nutritional anemia.	2	SK
DSC/Core (Major) C-12-P	DIET THERAPY-I (PRACTICAL)	1. Planning and preparation of normal diets. 2. Planning and preparation of fluid diets. 3. Planning and preparation of soft/semi solid diets.	4	AC+SM

		4. Planning and preparation of Diets for the following diseases: i) Peptic ulcer ii) Viral hepatitis iii) Anemia		
SEMESTER VI				
DSC/Core (Major) C-13-TH	FOOD PRESERVATION	1. Food preservation: definition, objectives and principles of food preservation. Different methods of food preservation.	2	SM
		2. Preserved Products: Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups-types, composition and manufacture, selection, cost, storage, uses and nutritional aspects.	4	AH
		3. Food Standards: ISI, Agmark, FPO, MPO, PFA, FSSAI	1	AH
DSC/Core (Major) C-13-P	FOOD PRESERVATION (PRACTICAL)	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.	6	SK
DSC/Core (Major) C-14-TH	DIET THERAPY-II	1. Energy modifications and nutritional care for weight management: Assessment, etiology, complications, prevention and treatment of obesity and underweight.	2	SD
		2. Diet in disease of the endocrine pancreas: Diabetes Mellitus: Classification, symptoms, diagnosis, management -insulin therapy, oral hypoglycemic agents, glucose monitoring at home, dietary care and nutrition therapy, meal plan (with and without insulin), special diabetic foods and artificial sweeteners.	3	AC
		3. Hypertension: classification, etiology, symptoms and dietary management.	3	SM

		Diseases of the cardiovascular system: Definition of infarct, ischemia, angina pectoris, myocardial infarction, heart attack and stroke. Atherosclerosis and hyperlipidemia — classification, symptoms, dietary and lifestyle management. Prevention of cardiovascular diseases.		
		4 Renal Diseases: Etiology, symptoms and dietary management of acute and chronic Glomerulonephritis. Nephrotic syndrome - dietary management. Uremia — dietary Nephrolithiasis - dietary management. Use of sodium and potassium exchange list.	3	AH
DSC/Core (Major) C-14-P	DIET THERAPY-II (PRACTICAL)	Planning and preparation of Diets for the following diseases: i) Obesity and Underweight ii) Diabetes mellitus iii) Hypertension and Atherosclerosis iv) Acute and chronic glomerulonephritis	6	AC
DSC/Core (Major) C-15-TH	FOOD MICROBIOLOGY	1. Food and Microorganisms: Brief history and scope of food microbiology, Important microorganisms in foods — Bacteria, Yeast, Mold, Factors affecting the growth of microorganisms in food : Extrinsic and intrinsic parameters. 2. Cultivation of microorganisms : Nutritional requirements of microbial growth, Types of media, Methods of isolation, Bacterial growth curve. 3. Control of growth of microorganism : Physical methods for removal of microbes - heat, irradiation, filtration, Chemical methods for removal of microbes - alcohol, aldehydes, dyes, halogens, phenols, gases, Primary	10	TP+SR

		sources of microorganisms in foods, Fundamental methods for control of microorganism in foods — Pasteurization, dehydration, freezing, freeze-drying, irradiation and preservatives. 4. Spoilage and contamination of different foods : Cereal and cereal products, vegetable and fruits, fish and sea foods, meat and meat products, eggs and poultry, milk and milk products, canned foods.		
DSC/Core (Major) C-15-P	FOOD MICROBIOLOGY (PRACTICAL)	Study of apparatus used in microbiology lab: Compound Microscope. Autoclave, Inoculation Chamber, Incubator Microscopic identification of microbes: Fungi, Bacteria, Yeast Preparation of liquid and solid media for culture of microorganisms Pure culture isolation techniques: Spread plate, Pour plate and Streak plate Staining Techniques to study of Morphology of microbial cells: Simple staining of bacteria, yeast and fungi, Differential staining with Gram stain technique	10	TP+SR
Minor Course Syllabus				
MINOR -1-TH	BASIC FOOD SCIENCE-I	Basic concept of Food, Nutrition and Nutrients. Classification of Food, Classification of Nutrients.	2	AC
		Carbohydrates- Definition, Classification, Structure and properties. Monosaccharides -glucose, fructose, galactose. Disaccharides-Maltose, lactose, sucrose	4	SM+AC

		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.		
		Lipids-Definition, Classification & Properties.Fatty acids-composition, properties, types. Lipids - sources, daily requirements, functions. Digestion & Absorption ofnutrients.Role&nutritionalsignificances ofPUFA, MUFA,SFA, W-3fattyacid.	2	SD
		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.	2	SK
		Dietary Fibre-Classification, sources, composition, properties & nutritional significance	1	AH
MINOR 1-P	BASIC FOOD SCIENCE -I (PRACTICAL)	1. Identification of Mono, Di and polysaccharides 2. Identification of Proteins 3. Identification of glycerol	4	TP+SR
MINOR 2- TH	BASIC FOOD SCIENCE-II	1.Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability &requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)	4	SM

		2.Vitamins - Biochemical and Physiological role, Bio-availability and requirements, sources, deficiency & excess (Fat soluble and water-soluble vitamins), Provitamin, Antivitamin, Pseudo vitamin and Vitamers.	4	AH
		3.Water - Functions, daily requirements, Effect of excess and deficiency. Water balance.	2	AC
MINOR 2- P	BASIC FOOD SCIENCCE-II (PRACTICAL)	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.	6	SR+TP
Minor-3-TH:	HUMAN NUTRITION-I	1. Concept and definition of terms- Nutrition, Malnutrition and Health: Scope of Nutrition.	1	SD
		2. Minimum Nutritional Requirement and RDA: formulation of RDA and Dietary Guidelines Reference Man and Reference Woman, Adult consumption unit.	1	SD
		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.	2	SM
		4. Growth & Development from infancy to adulthood: Somatic, physical, brain and mental development, puberty, menarche, pre-pubertal and pubertal changes, Factors affecting growth and development. Importance of Nutrition for ensuring adequate development.	3	AH+SK
		5. Growth monitoring and promotion:	1	AH+SK

		Use of growth charts and standards, Prevention of growth faltering		
Minor-3-P	HUMAN NUTRITION-I (PRACTICAL)	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	6	AC+SM
Minor -4-TH:	HUMAN NUTRITION-II	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. Adolescentpregnancy.	4	AH
		2. Nutrition during Lactation:Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding.	4	SD
		3. Nutrition during Infancy:Infant physiology relevant to feeding and care, Breast feeding colostrum, its composition	4	AC+SM

		and importance in feeding, Initiations of breast feeding. Advantages of exclusive breast feeding.Basic principles of breast feeding. Introductionof 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.		
		4. Management of preterm and low birth weight babies. 5. Nutritional needs of toddlers, preschool, school going children-and adolescents- Dietary management	1	SK
Minor-4 -P:	HUMAN NUTRITION-II (PRACTICAL)	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.	6	SM+AH
IDC				
IDC	BASIC NUTRITION AND FOOD SCIENCE (THEORY)	1. Definition of Food, Nutrition, Nutrient, Nutritional status, Dietetics, Balanced diet, Malnutrition, Energy (Units of energy — Joule, Kilocalorie).	2	SD+SK (SEM I)
		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.	4	AC+AH (SEM II)
		3. B.M.R: Definition, factors affecting B.M.R. and Total Energy Requirement (Calculation of energy of individuals).	2	AH+SM (SEM III)

		4. Basic five food groups: Nutritional significance of cereals, pulses, milk, meat, fish, vegetable, egg, nuts, oils, sugar.	4	
		5. Principles and objectives of meal planning and balanced diet.	2	
		6. Diet for a pregnant woman and Lactating mother	4	
		7. Diet for an infant, preschool child, school child, Normal male and female of different occupation.	4	
	BASIC NUTRITION AND FOOD SCIENCE (PRACTICAL)	1. Elementary idea of weight and measure. 2. Planning and preparation of Balanced diet for an adult. 3.Preparation of different types of nutritious tiffin for pre-schooler and school going Children.	6	SM+SK+ SD
MULTI DISCIPLINARY COURSE				
CC1- 1-TH:	BASIC FOOD SCIENCE - I	Basic concept on Food, Nutrition and Nutrients. Classification of Food, Classification of Nutrients.	1	AC
		Carbohydrates-Definition, Classification, Structure and properties. Monosaccharaides -glucose, fructose, galactose. Disaccharides-Maltose, lactose, sucrose Polysaccharides-Dextrin, starch, glycogen, resistant starch. Carbohydrates-Sources, daily	3	SM+AC

		requirements, functions. Effects of too high and too Low carbohydrates on health. Digestion and absorption of carbohydrate.		
		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-3fattyacid.	2	SD
		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.	2	SK
		DietaryFibre-Classification,sources,composition, properties &nutritionalsignificance	1	AH
CC1-1-P	BASIC FOOD SCIENCE- I (PRACTICAL)	Identification of Mono, Di and polysaccharides . Identification of Proteins . Identification of glycerol	6	SR+TP
CC1-2- TH	BASIC FOOD SCIENCE-II	1. Minerals & Trace Elements, Bio-Chemical and Physiological Role, bio-availability & requirements, sources, deficiency & excess (Calcium, Sodium, Potassium Phosphorus, Iron, Fluoride, Zinc, Selenium, Iodine, Chromium)	4	SM
		2. Vitamins - Biochemical and Physiological role, Bio-availability and requirements,	4	AH

		sources, deficiency & excess (Fat soluble and water-soluble vitamins), Provitamin, Antivitamin, Pseudo vitamin and Vitamers.		
		3. Water - Functions, daily requirements, Effect of excess and deficiency. Water balance.	2	AC
CC1-2- P	BASIC FOOD SCIENCE-II (PRACTICAL)	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.	8	SR+TP
CC1-3-TH	HUMAN NUTRITION-I	1. Concept and definition of terms-Nutrition, Malnutrition and Health: Scope of Nutrition.	2	AC
		2. Minimum Nutritional Requirement and RDA: formulation of RDA and Dietary Guidelines Reference Man and Reference Woman, Adult consumption unit.	2	SD
		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.	3	SM
		4. Growth & Development from infancy to adulthood: Somatic, physical, brain and mental development, puberty, menarche, pre-pubertal and pubertal changes, Factors affecting growth and development. Importance of Nutrition for ensuring adequate development.	3	AH+SK
		5. Growth monitoring and promotion: Use of growth charts and standards, Prevention of growth faltering	1	AH+SK
CC1-3-P:	HUMAN	1. Process involved in cooking: pressure	6	SM+AH

	NUTRITION-I_ (PRACTICAL)	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		
CC1- 4-TH	HUMAN NUTRITION-II	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.	3	AH
		2. Nutrition during Lactation: Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding.	2	SD
		3. Nutrition during Infancy: Infant physiology relevant to feeding and care,	4	SM+AC

		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.		
		4. Management of preterm and low birth weight babies. 5. Nutritional needs of toddlers, preschool, school going children-and adolescents- Dietary management	4	SK
CC1-4-P	HUMAN NUTRITION-II (PRACTICAL)	Planning and preparation of adequate meal for different age groups with special reference to different physiological conditions: infants, pre-schoolers, school children, adolescents, adults, pregnancy, lactation and old age	6	AH+SM
CC1- 5-TH	ADVANCED FOOD SCIENCE	1. Basic five food groups: Nutritional significance, composition and different products of cereal, millets, pulses, fruits and vegetables	4	SM
		2. Milk and milk products: Composition, types, processing (clarification, pasteurization, homogenization), storage, spoilage, uses, nutritional aspects of milk, curds, butter milk, paneer, khoa, cheese, ice-cream, kulfi and various kinds of processed milk.	3	AC
		3. Eggs: Composition, grade, quality, nutritional aspects.	2	SK

		4. Fish, Poultry and Meat: composition and nutritional importance of fish, poultry and meat.	2	SK
		5. Food additives and adulterants: Definition, purpose and types. Basic concept of different types of additives and adulterants present in food.	2	SD
		6. Nutritional significance of spices and herbs.	2	AH
CC1-5-P	ADVANCED FOOD SCIENCE (PRACTICAL)	1. Preparation of Milk based products like Flavoured Yoghurt, Flavoured curd, Butter milk, Custard, Pudding, etc. 2. Preparation of dehydrated Cereals, Millets and Pulses products like Chips, Papads etc. 3. Detection of adulterants in Milk and milk products (Starch, Sugar, Detergent), Spices like Turmeric powder (Metanil yellow, Starch), Chilli powder (Metanil yellow, Brick powder), etc.	6	SD+AH
CC1- 6-TH	Fundamentals of Community Nutrition	1. Concept and types of Community. Concept of community nutrition.	2	AC
		2. Nutritional Assessment: Meaning, need, objectives and importance. A brief idea on methods of nutritional assessment. Concept of ABCD method	3	SD
		3. Malnutrition: Definition, causes, classification, sign and symptoms of kwashiorkor, marasmus and marasmic kwashiorkor and their preventive measures.	3	AH
		3. Elementary idea of health agencies - FAO, WHO, ICMR, ICAR, NIN and CFTRI.	2	SK
		4. Nutritional Intervention programmes	3	SM

		to combat malnutrition: ICDS, Mid- Day Meal Programme, SNP, ANP, NNAPP, National Prophylaxis programme for prevention of blindness due to Vitamin A deficiency , IDD control programme		
		5. Nutrition Education: Definition, objectives of nutrition education. Methods of imparting nutrition education.	3	SK
CC1- 6-P	Fundamentals of Community Nutrition	1. Preparation of homemade ORS. 2. Preparation of weaning foods for infants. 3. Preparation of low cost and medium cost school tiffin 4. Growth charts - plotting of growth charts, growth monitoring and promotion. 5. Diet survey by 24 hours recall method.	6	AC+SK
CC1-7-TH	CLINICAL NUTRITION AND DIETETICS	1. Definition of Dietetics, dietitian, Goals of Diet Therapy.	1	AC
		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.	4	AC
		3. Obesity and underweight: Causes, risk factors, dietary and general management of overweight and underweight.	2	SD
		4. Diarrhoea, Constipation and Hepatitis: Causes, symptoms and dietary management.	3	SM
		5. Anaemia: Definition, causes, classification, and dietary management of Nutritional anaemia.	2	SK
		6. Hypertension, Atherosclerosis and Diabetes Mellitus: Definition, Causes, Types, risk factors, signs, symptoms and dietary	4	AH

		Management.		
		7. Fever: Definition, causes, types, symptoms and dietary management.	2	SD
CC1-7-P	CLINICAL NUTRITION AND DIETETICS (PRACTICAL)	1. Preparation of soft, full fluid and clear fluid diet 2. Planning and preparation of Therapeutic Diets for the following diseases: i) Diabetes mellitus ii) Hepatitis iii) Hypertension iv) Obesity v) Fever	6	AC
CC1- 8-TH	FOOD PRESERVATION	1. Food preservation: definition, objectives and principles of food preservation. Different methods of food preservation.	2	SM
		2. Preserved Products: Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups-types, composition and manufacture, selection, cost, storage, uses and nutritional aspects.	4	AH
		3. Food Standards : ISI, Agmark, FPO, MPO, PFA, FSSAI	1	AH
CC1 8-P	**FOOD PRESERVATION (PRACTICAL)**	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, tomato puree, jam, jelly, squashes etc.	4	SK
SEC	FOOD SAFETY AND QUALITY CONTROL	1. Food Quality: Meaning and definition of food quality, Quality factors in foods, indicators of food quality, importance and ways of Food Quality Assessment 2. Introduction to Food Hazards: Definition, types of hazard-physical,	2 3	AD SM

		chemical (naturally occurring, environmental and intentionally added) and biological, factors affecting (food borne pathogensbacteria, viruses and eukaryotes; sea food and shellfish poisoning and mycotoxins) 3. Hygiene and Sanitation : Principles of food hygiene, personal hygiene, kitchen hygiene and sanitation. water quality assessment, insect and pest control, waste treatment and disposal, food vending and packaging standards, employees' health 4. Food Safety Management Tools: Basic concept, prerequisites-GHPs, GMPs. HACCP, ISO series. National Food Standards (BIS, AGMARK) and Food Laws (PFA and FSSAI).	3 3	AH. AC
SEC	**FOOD SAFETY AND QUALITY CONTROL (PRACTICAL)**	Detection of adulterants in the following foods : Milk, Edible Oil, Sugar, Spices, Honey, Flours, Ghee, Beverages (one method of detection for each food item). 1. To detect the adulterants like dyes and argemone in the fats, oils and ghee. 2. To detect the presence of adulterants like water, urea, formalin, detergent, sugar and starch in the milk. 3. To detect the adulteration of insoluble substance, chalk powder and washing soda in sugar. 4. To detect the adulteration of brick powder in chilli powder, Metanil yellow in turmeric. 5. To detect colouring agents in fruit juices and sweets.	4	SD