ACADEMIC CALENDER

DEPARTMENT – FOOD AND NUTRITION

SUBJECT- FNTA

SESSION – 2017-2018

PART – I

PAPER - I

(UNIT- I & II)

FULL MARKS – 50+50

SESSION	TOPIC	Teacher
Term 1,Half 1, (July-October)	**HUMANNUTRITION** **UNIT-I** 1`.Concept and definition of the terms "Nutrition", "Malnutrition" and "Health" 2. Brief history of nutrition science. Basic concept and definition of terms related to nutrition. 3. Minimum nutritional requirement and RDA. Formulation of RDA. Dietary guidelines. Reference Man and Reference Woman. Drawbacks of RDA. 4. Energy in human nutrition. Idea of energy and it unit. Energy balance. Deficiency and excess of energy. BMR. Factors influencing BMR. SDA 5. Concept of Body composition. Body composition at different level. Brief idea about "Body composition and its change through life cycle". 6. Physiology of pregnancy. Nutritional requirement	SS SS GC SS SS

	during pregnancy and modification of existing diet. Antenatal care and schedule. Deficiency of nutrient (energy, protein, iron, folic acid, calcium, iodine) and its impact on pregnancy. Non-nutritional factors affecting pregnancy outcome. Importance of adequate weight gain during pregnancy. Adolescent pregnancy. Common complications during pregnancy (nausea, vomiting, pica, hypertension, obesity, food aversions, diabetes etc). 7. Nutritional requirement during lactation. Dietary management. Hormonal control of lactation. Preparation for lactation. Breast feeding. Colostrum, its composition and its importance in feeding. Basic principles of breast feeding. Advantages and complications of breast feeding. Galactogogue. **FOOD SCIENCE** **UNIT-II** **1.CARBOHYDRATES:** General Definition, Classification according to C- no, Saccharides- Definition as a special group of carbohydrates. a) Monosaccharides (Glucose, Fructose, Galactose) Structure (anomers, epimers, Fischer Projection St., Ring St.) properties - oxidation, reduction, mutarotation,acylation,reaction with compounds like NH X(Osazone), Glucose to Fructose Conversion & vice versa, reducing properties of sugar b) Disaccharides (Sucrose, Maltose, Lactose) Glycosidic linkage, Structure, Properties – inversion of	BG MS,MS

Term I HalfI July-September	sugar, reducing & non-reducing sugars. c) Polysaccharides (Dextrin, Starch, Glycogen) 1,4 & 1,6-glycosidic linkage, monomers, structures of amylose & amylopectin, differences in structure of the polysaccharides, hydrolysis of polysaccharides (enzymatic & chemical) Sources of carbohydrates, daily requirements, function, hypo-& hyper-effects on human health, Digestion & absoption, blood glucose & effects of different carbohydrates on blood glucose, Glycemic index. **2. PROTEINS:** General structure of amino acids, essential amino acids (structure), first & second class protein, Classification of proteins, Classification of amino acids according to chemical nature, Polypeptides, primary & secondary structure of proteins, Zwitter ion, isoelectric point, chemical denaturation. Sources of proteins, daily requirements, function, hypo- & hyper-effects on human health, Digestion & absorption, assessment of protein quality (BV,PER,NPU).	MS,MS

Term 1,Half 2 (November-December)	**HUMAN NUTRITION** 8. Nutritional requirement during infancy. Advantages of exclusive breast feeding during infancy. Duration of breast feeding. Introduction to supplementary foods. Initiation and management of weaning. Preparation of formula. Bottle feeding. Mixed feeding. Artificial feeding. Circumstances at which bottle feeding is to be given. Nutritional problems during infancy and practical approaches to combat the problem. **FOOD SCIENCE** **3.LIPIDS:** Definition, FFA, essential fatty acids, fatty acids & their importance, PUFA, MUFA, SFA, Properties - Iodine value, Saponification value, Acid value, hydrolysis, rancidity, hydrogenation. Sources of proteins, daily requirements, function, hypo- & hyper- effects on human health, Digestion & absorption. **4.DIETARY FIBRE**: Classification, sources, composition, properties & nutritional significance. **5.MINERALS & TRACE ELEMENTS**: Physiological role, requirement, source, deficiency and excess (calcium, phosphorus, iron-absorption and factors affecting iron absorption, fluoride, zinc, selenium, iodine, chromium)	BG MS,MS SS GC
	HUMAN NUTRITION	

Term 2, Half 1 (January-March)	9. Concept of growth chart. Use of growth chart. 10. Nutritional requirement and management of preterm and low birth weight baby. Feeding problems LBW baby. 11. Nutritional requirement and management of toddlers, pre-school, school going children, adolescents. Common nutritional problems of pre-school, school going children, adolescents. **FOOD SCIENCE** **6. VITAMINS:** physiological role, requirement, sources, deficiency & excess. **7. WATER:** Function, requirement, water balance, positive & negative water balance, water loss& gain, obligatory water loss, regulation of water balance.	SS SS,BG BG GC
Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER **SUBJECT- FNTA** **SESSION- 2017-2018**		
PART-I **PAPER- II; UNIT-I; (THEORETICAL); F.M.-50**		
SESSION	**TOPIC**	**Teacher**

Term 1, Half 1 (July-October)	1. Introductory studies on structure and function of **cells**: Nucleus, cell membrane, mitochondria, golgi body, ribosome, lysosome, endoplasmic reticulum. 2. Introductory studies on structure and function of **tissues**: connective tissue, epithelial tissue. 3. **Blood** and its composition. Blood group, Rh factor. Blood clotting. Basic mechanism of blood clotting. Blood transfusion. 4. **Cardiovascular system**: Anatomical structure of heart. Brief idea about circulation. Cardiac cycle. Heart rate and factors affecting it. Cardiac output and factors affecting it. Blood pressure and factors affecting it. 5. **Gastro-intestinal system**: Anatomical structure and function of G I system. 6. **Reproductive system**: Anatomical structure and function of sex organs. Spermatogenesis. Oogenesis. Role of hormones. Menstrual cycle. Pregnancy. Parturition. Lactation. Menopause.	MS MS MS
Term 1, Half 2 (November-December)	7. **Excretory system**: Structure and function of kidney. Brief idea about the role of kidney in homeostasis. Formation of urine. Normal and abnormal constituents of urine. Role of skin in regulation of body temperature. 8. **Respiratory system**: Brief idea about respiratory system. Different capacities and volumes. Mechanism of respiration. Transport of O_2 and CO_2 in blood. Acclimatization. Respiratory dead space.	MS MS

Term 2, Half 1 (January-March)	9. **Nervous system**: Elementary idea about anatomy of Nervous system. Introductory idea about central nervous system, peripheral nervous system, autonomic nervous system. Regulation of hunger, thirst. Anatomical structure of eye. 10. **Musculo-skeletal system**: Anatomical structure and function of skeletal, smooth and cardiac muscle. Mechanism of muscle contraction. Histology of bone and teeth. Anatomical structure of teeth. 11. **Endocrine system**: brief idea and definition of endocrine secretion. Different glands and their secretions: Pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, sex hormones. Excess and deficiency symptoms.	MS MS MS
Term 2, Half 2 (April-June)	Revision Classes are held	1st Year Test Exam

PART-I PAPER- II; UNIT-II; (PRACTICAL); F.M.-50		
SESSION	**TOPIC**	**Teacher**
Term 1, Half 1 (July-October)	• Measurement of blood pressure and pulse rate. • Determination of Haemoglobin by Sahli's method. • Preparation of blood film and identification of WBC.	MS
Term 1, Half 2 (November-December)	• Determination of bleeding time and clotting time of blood. • Blood grouping.	MS
Term 2, Half 1 (January-March)	• Identification of prepared slides (a) Lungs. b) suprarenal gland, c) thyroid, d) pituitary, e) testis, f) ovary, g) kidney, h) liver, i) pancreas, j)small intestine k) large intestine, l) spinal cord, m) cerebellum.	MS
Term 2, Half 2 (April-June)	Revision Classes are held	

ACADEMIC CALENDER

DEPARTMENT – FOOD AND NUTRITION

SESSION – 2017-2018

PART – II

PAPER - III (Unit – I & II)

FULL MARKS-50+50

SESSION	TOPIC	Teacher
	<u>COMMUNITY NUTRITION</u>	

Term 1, Half 1, (September-October)	**(UNIT-I)** 1. **Introduction to community nutrition**. Concept of community. Characteristics of community, Types of community. Different factors affecting health of the community (like social, cultural, economic, political and environmental factors). 9. **Nutritional intervention program** to combat malnutrition. 10. **Nutrition Education**: (elementary idea) Reason for Nutrition Education, objectives. **PUBLIC HEALTH & EPIDEMIOLOGY** **(UNIT-II)** 1**. Health & its dimensions:** definition of health, different dimension of health. Positive health versus absence of disease.	SS SS,MS GC GT

	2**. Secondary sources of community health data:** Sources of relevant vital statistics of infant. Child & maternal mortality rate. Brief idea about epidemiology of nutritionally related diseases (amoebiasis, hyperlipidaemia, clotting disorder, beriberi, rotaviruus infection). 7. **Community food protection:** Epidemiology of food borne diseases. Mode of transmission. Prevention & control (Salmonellosis, Shigellosis, typhoid, botulism, Cholera, E.coli food poisoning, Staphylococcal food poisoning).	GT GT
Term 1, Half 2 (November-December)	**<u>COMMUNITY NUTRITION</u>** 2**. Direct nutritional assessment of human**: Nutritional anthropometry, Clinical signs, Biochemical and Biophysical methods. 3. **Nutritional Anthropometry**: its need and importance in brief. Parameters of nutritional anthropometry and techniques of measurement. Growth chart and its usage. 4. **Clinical Signs**: its need and importance in brief. Clinical signs of PEM, vitamin A deficiency, IDD, Anemia. 5. **Diet Survey**: its need and importance in brief. Important factors for diet survey in brief (like trained personnel, sampling,	SS MS

	method etc). Different methods for conducting diet survey. Concept of consumption unit. Adequacy of diet with respect to RDA. Food security. 7. **Concept of surveillance**: food and nutrition surveillance, need for surveillance, objectives of surveillance, indicators of nutritional surveillance, importance and use of surveillance. **PUBLIC HEALTH & EPIDEMIOLOGY** 3. **Public health & epidemiology:-** definitions, Components of epidemiology and aims, different tools & measurements of epidemiology. Brief idea about epidemics. Epidemiological methods: analytical epidemiology - case control & cohort study, epidemics and its types, vital statistics, epidemiological triad, demography and life expectancy. 4. **Communicable & infective disease control:** definitions related to communicable diseases. Infection, contamination, decontamination, disinfection, transmission (direct & indirect) brief idea about different vector borne diseases- brief idea about AIDS, malaria, poliomyelitis, dengue, tuberculosis, MMR, chicken pox, pertussis, chikungunya, epidemiological principles of disease prevention and control	SS GT GT

Term 2, Half 1 (January- February)	**COMMUNITY NUTRITION** 6**. Malnutrition**: its sociological factors. Food production and availability, socio-economic factor, cultural influence, food consumption, population problem with respect to food production and availability, medical and educational services, psychological factor, emergency and disaster condition. Prevention of malnutrition. 8. **International, national, regional Agencies and Organizations** : WHO, FAO, CARE,UNICEF, International Red Cross, NIN, ICMR, ICAR,CFTRI, FNB, NNMB, Indian Red Cross, CSWB, Nutrition Foundation of India. **PUBLIC HEALTH & EPIDEMIOLOGY** **5. Immunization:-** Definition**.** Host defenses and immunity. Immunizing agents: its types. National immunization schedule- its importance. Immunization for adults &	MS GC GT

	foreign travelers. Hazards of immunization. Health advice to the foreign travelers. **6. Community water & waste management:** Importance of water to the community. Sources of water. Concept of water pollution. Purification of water in small & large scale. Drinking water handling & safe drinking water. Water borne diseases (diarrhea, dysentery, arsenic toxicity). **Waste-**Types and methods of disposal, sewage disposal and treatment, Treatment and disposal technologies of health care wastes.	GT
Term 2, Half 2 (March-April)	Revision Classes are held (Theory and Practical)	1st year Test Exam

ACADEMIC CALENDER

DEPARTMENT – FOOD AND NUTRITION

SUBJECT- FNTA

SESSION – 2017-2018

PART – II

PAPER - IV (Unit – I & II)

FULL MARKS (50+50)

SESSION	TOPIC	Teacher

Term 1, Half 1, (September-October)	**FOOD COMMODITIES** **UNIT-I** 1. **Cereals & their products**: Structure, nutritive value of cereals. Rice - composition, processing, Brief idea about different fermented rice products. Wheat: - composition, processing. Brief idea about different wheat products - millet like Jowar, Ragi, Bajra. Role of cereals in cookery. Gelatinization, Gluten formation. Breakfast cereal. 2. **Pluses**: composition, nutritive value, processing (soaking, germination, fermentation). Toxic constituent present in pulses. Pulse cookery. Factors affecting cooking quality. Role of pulses in cookery.	DP

	3. **Milk and milk products**: composition of milk. Nutritive value of milk. Physical properties of milk. Pasteurization of milk. Microbial spoilage of milk. Effect of enzyme, acid and heat on milk. Role of milk in cookery. Different fermented milk products like cheese, butter, curd. Brief idea about different non fermented milk products like ice cream, skimmed milk, toned milk, double toned milk, sweetened condensed milk, recombined milk etc. 4. **Egg:** Structure, nutritive value, composition. Effect of heat on egg, and factors affecting coagulation of egg protein. Hard and soft egg. Egg foaming and factors affecting egg foaming. Preservation of egg, Role of egg in cookery. **Community Nutrition (Practical)** **(UNIT – II)** 1.Anthropometric Measurement of infant- Length, Weight, Circumference, Chest, Mid- upper arm circumference, precautions to be taken. Comparison with norms and interpretation of the nutritional assessment date and its significance. Weight for age, height for age, weight for	BG

	height, Z scores body Mass Index (BMI), Waist-Hip Ratio (WHR).	
Term 1, Half 2 (November-December)	**<u>FOOD COMMODITIES</u>** 5. **Meat, Fish, Poultry:** classification of meat. Nutritive value of meat. Ageing, tenderization, artificial tenderization, curing of meat. Smoking of meat Fish:-composition, nutritive value, selection .spoilage of fish. Poultry:-processing, classification, composition. 6. **Vegetables and Fruits:** classification of Vegetables. Nutritive value, composition of vegetables. Vegetable cookery. Effect of cooking on pigments present in vegetables. Loss of nutrient during cooking. Prevention of loss of nutrient. Storage of Vegetables. Classification of Fruits. Nutritive value, composition of Fruits. Pigments present in fruit. Bitterness in fruit. Ripening of fruits: Browning reaction. 7. **Sugar and its products:** Properties of sugar. Different sugar and their product. Crystallization of sugar. Factors affecting crystallization. Brief idea about different crystalline and non-crystalline	DP

	candies. Caramelization. Role of sugar in cookery. Different natural and artificial sweeteners. 8. F**ats and Oils:** Classification & Nutritive value of fats and Oils. Different fatty acids. Structure of fat. Composition of fat. Chemical properties. Analysis of fats & oils. Degradation of fat, factors affecting it & its prevention. Smoking temperature of fat. 9. **Food Preservation:** Objectives of preservation in brief. Different methods of preservation. Basic idea of food spoilage. Preparation of preserved products like jam, jelly, squash, pickles etc. **<u>Community Nutrition (Practical)</u>** 2. Growth charts-plotting of growth charts, growth monitoring and promotion. 3. Clinical assessment and signs of nutrient deficiencies, Anaemia, Rickets, B-Complex deficiencies. 4. Estimation of food and nutrient intake-Household food consumption data, per 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	BG

	of intakes.	
Term 2, Half 1 (January-February)	**FOOD COMMODITIES** 10. **Food Additives:** Brief idea about food additives. 11. **Leavening agent:** Brief idea about different leavening agent like baking powder, egg etc. 12. **Food adulteration & Food Standards:** Different food standards: BIS, Agmark, FPO, PFA, MPO etc. basic idea about food adulteration, quality. Factors responsible for food adulteration. 13. **Convenience Food:** Basic idea, types, role of convenience food. 14. **Spices:** Different spices, their composition, medicinal value & use. Basic idea about herbs. 15. **Beverages:** Classification Tea: nutritional aspect, classification, processing of tea, different types of tea. Coffee: composition, processing, nutritional aspect of coffee. Bitter substances present in coffee, different coffee products. Chocolate & cocoa: processing, composition & nutritional	BG DP

	aspect. Alcoholic beverages: beer, rum, wine- their processing. Carbonated beverages. **<u>Community Nutrition (Practical)</u>** 5.Community field survey.	BG
Term 2, Half 2 (March-April)	Revision Classes are held (Theory and Practical)	1st year Test Exam

ACADEMIC CALENDER DEPARTMENT – FOOD AND NUTRITION SUBJECT- FNTA SESSION – 2017-2018 PART – III PAPER - V		
SESSION	TOPIC	Teacher
Term 1,Half 1, (July-October)	**<u>Unit I:- Nutritional Biochemistry (50)</u>** **1.<u>ENZYMES & COENZYMES</u>: ENZYMES:** Definition & Classification, Kinetics (Gibbs free energy change, Reaction initiation energy), Michalies-Menten equation, Reciprocal plot & its significance, Vmax & Km, substrate specificity, enzyme inhibition (irreversible- Penicillin	MRS

	inhibition, reversible explained from Reciprocal plot, allotter-ribonucleotide reductase inhibition by nucleotides), isozymes-ex. LDH. **COENZYMES:** Definition, Biochemical Functions of: NAD, NADP, FAD, CoA, Tetrahydrofolate, TPP. Names of the Vitamines present in those coenzymes, **2.CARBOHYDRATES:** Glycolysis, Citric acid cycle, Electron transport chain (brief idea), glycogenesis, glycogenolysis, gluconeogenesis.HMP Shunt. **3.LIPID:** Beta-Oxidation, (alpha and omega oxidation-definition only), Synthesis & utilization of ketone bodies,	

	Ketosis, Causes of fatty liver. **Unit II:Food Microbiology** (50) **1.Microscope: -** Different parts of microscope and its functions. **2.Cultivation of Bacteria**:-Nutritional requirements of micro-organisms, types of growth media (selective, differential, enric media-definition with example), Pure culture methods (streak pl spread plate pour plate, slant culture), Anaerobic cultivation of bacteria. **3.Growth of Bacteria**:-Definition, growth phase, direct and ind measurement of growth, Factors affecting growth (pH, temp an oxygen).	DP DP DP
Term 1,Half 2 (November-December)	**NUTRITIONAL BIOCHEMISTRY- UNIT-I** **4.PROTEIN:** Tertiary & Quaternary structures of protein with Haemoglobin & Collagen as examples, Deamination & Transamination, amino acid metabolism. **5.NUCLEIC ACID :** Structure of Purines & Pyrimidines, Nucleosides & Nucleotides, Formation of Nucleic Acid Chain from Nucleotides, Importance of Thymine in DNA structure, Types of RNA & their functions (in brief), Structure of t-RNA, Codons, Definition of Central Dogma(Replication, Transcription, Translation - elementary idea only) & Machineries needed in each step(only names of the	MRS MRS

	enzymes and coenzymes). **FOOD MICROBIOLOGY UNIT-II** **4.Stain and staining techniqu**- dye (Chromophore, auxochrome-definition with example). Classification of stains, principles of staining, simple staining, negative staining, differential staining (Gram staining and acid fast staining). **5. Morphology of Bacteria**:- slime layer, capsule, cell wall, flagella, pili, fimbriae, cell membrane, ribosome, cytoplasmic inclusions(inorganic), endospore (structure, formation and germination).. **6.Control of microbes**:-Sterilization, Disinfection, ntiseptics, detergents, Methods of sterilization-Physical (heat, ow temp, radiation, filtration). Chemical (alcohol, phenol, alogen, heavy metals, formaldehyde).	DP DP DP
Term 2, Half 1 (January-March)	**NUTRITIONAL BIOCHEMISTRY UNIT-I** **6. VITAMINES:** Structure & Biochemical roles, Deficiency disorders of Vitamin **A, D, E.K, B_1, B_2, B_6,** Folic acid, Pantothenic acid, Niacin & Vitamin C. **7.MINERALS:** Biochemical functions of Na, K, Ca, P, I, Fe, Se - Disorders related to Hyperactivity & Deficiencies of those elements. **8.CELLULAR TRANSPORT:** Preliminary idea about membrane permeability, Active & Passive transport,	MRS MRS

	Facilitated transport, a brief idea about gated-channels & membrane-bound transport protein. **<u>FOOD MICRIBIOLOGY UNIT-II</u>** **7.FOOD MICROBIOLOGY:-** milk as a growth medium of bacteria, normal microflora in milk, undesirable microbes in milk,Pasteurisation, phosphatase test, Methylene blue reduction test. Normal microflora of vegetables & fruits, meat, fish, egg, canned food, cereal &cereal products, enumeration of microbes present in food & milk. Outline of methods for detection of microorganisms in drinking water (presumptive, confirmatory and completed test).distinction between faecal and non faecal coliforms- IMVic test. Extrinsic & intrinsic parameters affecting growth & survival of microbes. **8..<u>Food borne diseases</u>**: - Food borne infection & intoxication. Different food borne diseases like Shigellosis, salmonellosis, *Clostridium Perfringens* food poisoning, Typhoid, *E.Coli* food poisoning, *Bacillus cereus* food poisoning-causative agent, symptoms, pathogenicity & preservation.	DP DP

Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER DEPARTMENT – FOOD & NUTRITION SUBJECT- FNTA SESSION – 2017-2018 PART – III PAPER - VI (UNIT I&II) FULL MARKS: 50+50		
SESSION	TOPIC	Teacher

Term 1,Half 1, (July-October)	**DIET THERAPY UNIT-I** **1.Basic concept of diet therapy: -** different definitions related to diet therapy. **2.Routine Hospital Diet:-**Modification of normal diet into therapeutic diet. Purpose of diet therapy. Different modifications. **3.Diet with Energy Modification: -** Energy modification & nutritional care for weight management, identifying the overweight obese, aetiological factors contributing obesity, prevention & treatment of obesity. Low energy diet & balanced energy reduction. Underweight - aetiology, an assessment, high energy diets for weight gain. **DIET THERAPY UNIT II**	SS

	1. DIABETES MELLITUS: General introduction & classification, Factors responsible for diabetes, Role of hormones Characteristics of typeI &type II diabetes Treatment & dietary management of diabetes Complications associated with it. **2. FOOD ALLERGY:-** Introduction & definition related to food allergy, Predisposing factors of food allergy,Reasons for allergy, Classification of allergy, Allergic reaction (elementary idea) Symptoms of allergy, Role of food as allergen Treatment & dietary management of food allergy, with elimination diet.	SS SS

Term 1,Half 2 (November-December)	**DIET THERAPY UNIT-I** **4.DIET FOR FEBRILE CONDITION**:- Different causes of fever, Metabolic changes during fever (elementary idea), General dietary consideration, Causes, clinical features, treatment& dietary management of- Short time fever(influenza), Chronic fever (tuberculosis), Intermittent fever (Malaria). **5.DIET DURING SURGERY:-** General introduction, Pre & post operative diet (brief idea), Dietary management. **6.DISEASES OF LIVER:-** General introduction, Symptoms of liver disease, Reasons of liver diseases, Basic idea of liver function tests, Causes, clinical features, treatment& dietary management of- Infective hepatitis & jaundice, Cirrhosis of liver, Hepatic coma, Infantile billiary cirrhosis. **DIET THERAPY UNIT II** **3.CARDIO VASCULAR DISEASES**: General information & brief idea, Causes or factors of CHD in brief, Dietary management, symptoms in brief of the following: atherosclerosis, hypertension, hypercholesterolemia, IHD, Congestive cardiac failure.	BG SS BG

Term 2, Half 1 (January- March)	**DIET THERAPY UNIT I** **7.GALL STONE DISEASE:**General introduction, Type of stones, Dietary management. **8.PEPTIC ULCER:-**General introduction of peptic ulcer disease,Causes of peptic ulcer disease, Mechanism of ulcer formation, Symptoms of peptic ulcer disease,Treatment & dietary management. **9.INTESTINAL DISORDERS:-** General introduction and dietary management of different intestinal disorders- **Constipation**:- causes, complication, type (in brief), Dietary management.**Flatulence:-**causes, treatment, dietary management. **Diarrhoea:-**causes, physiological disturbance in the body during Diarrhoea. Different types of Diarrhoea, Symptoms, Complication. Prevention & treatment.ORS. **Steatorrhoea: -** causes, treatment, dietary management. **Ulcerative colitis**-causes, symptoms, treatment & dietary management. **Irritable bowel syndrome**: - causes, symptoms, dietary management. **DIET THERAPY UNIT II** **4.RENAL DISEASES:-** General introduction. Causes, symptoms in brief & dietary management of the following: Type I or Glomerulonephritis, Type II or Nephrotic Syndrome, Acute & chronic renal failure, Renal	BG GC BG

	calculi.	
Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER DEPARTMENT –FOOD & NUTRITION SUBJECT- FNTA SESSION – 2017-2018 PART – III PAPER -VII UNIT- I & II FULL MARKS- 50+50		
SESSION	TOPIC	Teacher
Term 1,Half 1, (July-October)	**NUTRITIONAL BIOCHEMISTRY UNIT I** GROUP A:-QUALITATIVE ESTIMATION 1. Qualitative estimation of Carbohydrate(Mono,di and poly saccharides) Glucose, Fructose, Sucrose, Lactose, Starch, Dextrin.	MRS

	2.Colour reactions of Protein GROUP B:- QUANTITATIVE ESTIMATION 1. Standard curve of Protein by Biuret method using BSA. 2. Standard curve of Protein by Folin Phenol method using BSA. 3. Estimation of unknown Protein from egg or serum protein.	

	FOOD PRESERVATION UNIT II 1. Introduction to food preservation and different methods of food preservation. Purpose of food preservation. 2. Use of natural and chemical preservatives in preparation of different preserved products: Jam, Jelly, Squash, Pickles, Murabba etc.	SS
Term 1,Half 2 (November-December)	**NUTRITIONAL BIOCHEMISTRY UNIT I** GROUP A- QUALITATVE ESTIMATION 3.Qualitative estimation of Fat.Solubility test, Unsaturation test, Saponification test, Test with soap & acrolin layer. GROUP B:- QUANTITATIVE ESTIMATION 4.Standard curve of PNP 5.Preparation of Buffer. 6.Quantitative estimation serum acid phosphatase. 7.Quantitative estimation serum alkaline phosphatase. **FOOD PRESERVATION UNIT II** 3.Use of sun drying for preservation of food. 4.Preparation of fermented food product.	MRS SS

Term 2, Half 1 (January- March)	**NUTRITIONAL BIOCHEMISTRY UNIT I** GROUP A- QUALITATIVE ESTIMATION 4.Chromatographic separation of Amino Acids from mixture of amino acids & determination of Rf value. GROUP B:- QUALITATIVE ESTIMATION 8.Quantitative estimation of vitamin C in lemon juice. 9.Quantitative estimation of glucose using fehling solution. 10.Determination of acid value of fat. **FOOD PRESERVATION UNIT II** 5.Visit:- Milk industry visit Food testing lab visit.	MRS SS
Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER

DEPARTMENT – FOOD & NUTRITION

SUBJECT- FNTA

SESSION – 2017-2018

PART – III

PAPER - VIII UNIT I, II,III

FULL MARKS: 35+30+35

SESSION	TOPIC	Teacher
Term 1,Half 1, (July-October)	**DIET THERAPY PRACTICAL UNIT I** 1. Introduction to therapeutic nutrition, its objectives. Different modification techniques (demonstration). 2. Planning and preparation of normal diet. 3. Planning and preparation of clear fluid and full fluid diet. 4. Planning and preparation of soft diet. **FOOD MICROBIOLOGY UNIT II** 1.Basic idea of process of sterilization. 2.Preparation of Nutrient agar media. **PROJECT & SEMINAR UNIT III** 1.Review and project work	BG,GC DP MS,DD,BD,DP,BG

Term 1,Half 2 (November-December)	**DIET THERAPY UNIT I** 5.Planning and preparation of diets for the following condition :Jaundice, Peptic Ulcer, Diabetes, Fever. **FOOD MICROBIOLOGY UNIT II** 3. Inoculation of one gram positive and one gram negative bacteria 4. Gram Staining. **PROJECT & SEMINAR** 1.Review and project work	BG,GC DP SS,MS,GC,DP,MRS
Term 2, Half 1 (January- March)	**DIET THERAPY UNIT I** 6 .Planning and preparation of diets for the following condition: CHD, Gout, Renal Failure(acute or chronic),Obesity. **PROJECT & SEMINAR** 2. Seminar presentation.	GC,BG SS,MRS,GC,BG,DP,MS
Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER

DEPARTMENT –FOOD AND NUTRITION

SUBJECT: FOOD AND NUTRITION(GENERAL)

SESSION – 2017-2018

PART – I

PAPER -I

UNIT-I& II

SESSION	TOPIC	Teacher
Term 1,Half 1, (July-October)	**UNIT-I** NUTRITION SCIENCE: 1. Food in relation to health, functions of food 2. Carbohydrates- Classification with examples, nomenclature(brief), study of important properties of glucose, fructose, sucrose, lactose & galactose - Sources, functions, Deficiency, Excess 3. Proteins-classification with examples, composition, EAA, General properties of protein, Sources, Functions, Deficiency, Excess **UNIT-II** *Group A(physics and chemistry)* 1. Measurement of mass and, weight, Common and Spring Balance. 2. Viscosity, Specific Gravity, Surface Tension-Definition, units(no formulae), biological examples *GroupB (Physiology including Biochemistry)* 1. Animal cell: Definition, Structure and functions of different parts 2. Blood: Definition, Composition, Blood Corpuscles, Functions, Blood group, Rh factor,	SS,BG,DP

	Agglutination *Group-c (Cooking methods and Kitchen Sanitation)* 1. Different methods of cooking-Moist heat, Dry heat and combination method- Principles, Methodology, Uses, Common Foods, merits and demerits	
Term 1,Half 2 (November-December)	**UNIT-I** NUTRITION SCIENCE: 4. Lipids-Definition, Classification with examples, EFA, Study of important properties of fats and oils, Saponification Value, Iodine value, Sources, Functions, Deficiency, Excess 5. Vitamins: Fat soluble-A,D,E,K Water soluble vitamins: Thiamin, Riboflavin, Niacin, Pyridoxin, Vit C, B_{12}:Sources, Functions, Deficiency, Disease and Hypervitaminosis **UNIT-II** *Group A(physics and chemistry)* 3. Calorimetry- Definition, Types – Direct& Indirect Calorimetry, Application in energy metabolism, Bomb Calorimeter 4. Microwave oven-Principles, uses, merits, demerits *GroupB (Physiology including Biochemistry)* 3. Digestive system: Structures involved in digestive system(mouth, oesophagus, stomach, small intestine, large intestine, Liver, Pancreas, Gall bladder), their functions, Composition of different digestive juices and their functions. 4. Digestion and absorption of carbohydrate, Protein and Fat	SS,BG,DP DP

	Group-c (Cooking methods and Kitchen Sanitation) 2. Planning of ideal kitchen ,safety aspects , Traditional & Modern appliances	
Term 2, Half 1 (January- March)	**UNIT-I** 6. Minerals: Ca, Fe, K, Na, P, I, F- Sources, Functions, Deficiency, Diseases and excess (Absorption of Ca and Fe only) 7. Water and Dietary Fibre- Sources, Functions, Deficiency, Diseases **UNIT-II** Group A(physics and chemistry) 5. General concept of acids, Bases, Salts, Conjugate acids, Conjugate bases, pH, buffer solution , Neutralisation, Acid base indicators, Molar solution, Normal solution , Formal Solution 6. Diffusion, Osmosis, Osmotic Pressure, isotonic Solution- Definition and examples 7.Colloids-Definition, Types of colloidal system, Important properties of colloidal sols, Dialysis GroupB (Physiology including Biochemistry) 5. Metabolism: Glycolysis, TCA Cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis,Cori cycle, Deamination, Transamination Group-c (Cooking methods and Kitchen Sanitation) 3. Brief idea on kitchen garden-Planning , Uses.	SS,BG,DP

Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER DEPARTMENT –FOOD AND NUTRITION SUBJECT: FOOD AND NUTRITION(GENERAL) SESSION – 2017-2018 PART – II PAPER -II&III UNIT-I		
SESSION	TOPIC	Teacher

Term 1,Half 1, (July-October)	**UNIT-I** FOOD SCIENCE: 1. Definition of Food, Nutrition, nutrient, health, nutritional status, balanced diet, malnutrition, energy(units) 2. Definition of BMR, Factors controlling BMR, Energy Balance, RDA 3. Basic Five Food groups: Types, Composition, Nutritional significance, role of cookery of Cereals, Pulses, Milk and milk products, Meat, Fish, Egg, Vegetables & fruits, nuts, oils and sugar. **UNIT-II** THERAPEUTIC NUTRITION 1. Basic Concept of diet therapy, Principles and classification of the therapeutic diet **PAPER-III(PRACTICAL)** 1. Elementary idea of weights and measures. 2. Processes involved in food preparations- Boiling, Roasting, Stewing, Poaching, Frying, Grilling, Pressure Cooking(one of each type) 3. Preparation of Supplementary foods	SS,GC,BG

	for infants(minimum two)	
Term 1,Half 2 (November-December)	**UNIT-I** FOOD SCIENCE: 4. Principle and objectives of meal Planning 5. Nutritional requirement(RDA), Dietary guidelines of Pregnant and Lactating Women, Infants (Weaning, Supplementary food),Preschool children, School Children(School Lunch Programme), Adult males, females, Old age people **UNIT-II** THERAPEUTIC NUTRITION 2. Hospital diet: regular, Soft, Fluid, Special Feeding Methods-Advantages and Disadvantages. 3. Dietary management in Gastrointestinal Disease (Diarrhoea, Constipation, Gastritis, Peptic ulcer& Flatulence), Fever(short term), Diabetes Mellitus(Type II-NIDDM), Heart disease (Hypertension, Atherosclerosis, Hyperlipidaemia), Liver Disease (Infective Hepatitis, Cirrhosis of Liver), Gout, Obesity (including assessment indices), Underweight **PAPER-III(PRACTICAL)** 4. Planning and Preparation of Fluid diet, Soft and Semisolid diet(one of each type) 5. Preparation of cereals, Pulses, Vegetables, Egg, Milk, Fish, Nuts (one from each group) 6. Preparation of ORS	BG,SS,GC

Term 2, Half 1 (January- March)	**UNIT-I** FOOD SCIENCE: 6. Deficiency Diseases (Nutritional Anaemia, PEM,IDD,VAD)- Aetiology, Prevalence, Clinical findings, Prevention& treatment **UNIT-II** THERAPEUTIC NUTRITION 4. Food allergy: Definition, Sources, Symptoms, Diagnosis, Treatment, Food Intolerance **PAPER-III(PRACTICAL)** 7. Preparation of Jam, Jelly, Squash, Pickles 8. Planning of a day's diet for a pregnant and lactating mother 9. Planning and preparation of a day's diet for the following conditions- Peptic Ulcer, Fever, Hypertension, Diabetes mellitus(Type-II,NIDDM)	SS,BG,GC
Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER

DEPARTMENT –FOOD AND NUTRITION

SUBJECT: FOOD AND NUTRITION(GENERAL)

SESSION – 2017-2018

PART – III

PAPER -IV

UNIT-I&II

SESSION	TOPIC	Teacher

Term 1,Half 1, (July-October)	**UNIT-I** Group A- COMMUNITY NUTRITION 1. Concept of Community 2. Methods of assessment of nutritional Status- Anthropometry, Clinical, Biochemical, Diet Surveys, Vital health statistics Group B(Food Microbiology & Sanitation) 1. Elementary structure and characteristics of microbes- Bacteria, Virus, Fungi including Mold, Yeast and Protozoa. 2. Food Spoilage- Cereals, Pulses, Vegetables & Fruits, Milk and Milk Products, Fleshy Foods, Fats and oils **UNIT-II** PRACTICAL: 1. Diet Survey in a household of slum or rural area	SS,MS,BG,DP

Term 1, Half 2 (November-December)	**UNIT-I** Group A- COMMUNITY NUTRITION 2. Role of National and International Organization in improving Community Health: WHO, FAO, UNICEF,CARE, NIN, CFTRI, ICMR 3. Nutrition Education in community- Definition, Methods, Uses Group B(Food Microbiology & Sanitation) 3. Food Borne infections and infestations- Causative Organisms, Symptoms, Mode of Transmission, Methods of Prevention 4. Food Preservation- Definition, Objectives, Methods- main principle, procedure, common examples **UNIT-II** PRACTICAL: 2. Plotting of Growth Chart	
Term 2, Half 1 (January-March)	**UNIT-I** Group A- COMMUNITY NUTRITION 5. Current National Nutrition Intervention Programmes in India- SNP, ANP, ICDS, Mid Day Meal, NIDDCP, NPPNB, NNAPP Group B(Food Microbiology & Sanitation) 5. Food Adulteration- Definition, Types, Intentional adulterants & Method of detection, Food Laws and Food Standards- PFA Act, AGMARK, FPO, MPO, Codex Alimentarius, Consumer Protection Act, HACCP **UNIT-II** PRACTICAL: 3. Identification of unknown microbes(Prepared Slides)	SS,BG,MS,DP

Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDAR 2018-19

1ST SEMESTER	Topic	Teacher	Time to complete
	CORE COURSE (CC) FNTACOR01T: HUMAN NUTRITION (THEORY) TOTAL HOURS: 60 4 CREDITS 1.IntroductiontoFoodandNutritionNo.ofHours10Foods:Energygiving, bodybuildingandprotective.Nutrients:macroandmicronutrients,Dietand balanceddiet,Menu.Healthandnutritionalstatus.Malnutrition,functional food, prebiotics, probiotics, 8 phytochemicals, nutraceuticals. Fibre. Functions of foods: physiological, psychological, social. Food groups,foodpyramid,Relationbetweenfoodandnutrition,healthanddiseases.	SS	JULY
	2. Foods, Nutrients and cooking of food No. of Hours 10 Foods and their nutrientcontents:Nutrientspresentincerealsandmillets,pulses,nutsand oil seeds, fruits and vegetables, milk and milk products, flesh food, eggs, Condiment and spices, salt. Nonnutrient components of foods: phytate, tannins,oxalate,trypsininhibitor,goitrogensandothertoxicagentsinfood. Cooking: Beneficial and adverse effects of cooking. Different methods of cooking-dry, moist, frying, and micro wave cooking-advantage, disadvantageandtheeffectofvariousmethodsofcookingonfoods,Solar cooking.	BG	JULY-SEPTEMBER
	3.FoodenergyandenergyrequirementsNo.ofHours15Theenergyvalue of foods: Physical and physiological calories. Bomb calorimeter Energy requirement of an individual: Basal metabolic rate (BMR) and physical activity..BMR:Measurement(directandindirect),factorsaffectingBMR, SDAoffoods.physicalactivityratio(PAR).Classificationofactivitiesbased on occupations.Nutritional requirements and Recommended dietary allowances(RDA):factorsaffectingRDA,ApplicationofRDA,Referencemanandwoman..	MS	JULY-SEPTEMBER
	4.DigestionofFoodsNo.ofHours25Componentsofgastrointestinaltract. Structure of different segments of GI tract. Digestive glands: structure of salivary glands, gastric glands and intestinal glands. Structure of pancreas andliver.,	BM	JULY-SEPTEMBER
	5.Digestivesecretions:salivaryjuice,gastricjuice,pancreaticjuices and intestinal juices. Bile and bile secretion. Digestion and absorptions of carbohydrate, protein,lipid, fat soluble vitamins, water soluble vitamins(thiamine, riboflavin, niacin, pyridoxine, folate, vit B12, vit C), minerals (Ca, Fe, I, F, Cu, Zn)		
	INTERNAL SCRIPTS WILL BE CHEKED BY: SS		
	FNTACOR01P: HUMAN NUTRITION (PRACTICAL) TOTAL HOURS: 60 2 CREDITS 1. Process involved in cooking, microwave, steaming, grilling, deep fat frying.	SS	SEPTEMBER-OCTOBER
	2.Generalconceptsofweightsandmeasures,Eyeestimationofrawcooked foods	SS	SEPTEMBER-OCTOBER
	3. Preparation of food from different food groups and their significance in relation to health	GC	OCTOBER-NOVEMBER

	4. Preparation of supplementary food from different age group and their nutritional significance	BG	OCTOBER-NOVEMBER
	5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child	GC	October-November
	INTERNAL PRACTICAL MARKS :- BG AND GC		
	FNTACOR02T: PHYSIOLOGY IN NUTRITION (THEORY) TOTAL HOURS: 60 4 CREDITS 1.Unit of Life: Cell and Tissue Structure No. of Hours 12 Differencebetweenprokaryoticandeukaryoticcells&plantandanimalcells, Structure and basic functions of animal cell organelles, Structure and functions of plasma membrane, Role of membrane in transport and communications, Importance of cell junction- tight, gap and desmosome, Types of human tissue- location, structure and functions. Structure of muscles, bones, teeth andjoints.	BM	JULY
	2.Blood and body fluids No.ofHours12 Blood and its composition, Morphology, formation and functions of formed elements, Blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Mechanism of blood coagulation, Haemoglobin- structure and function.Extracellular fluid, lymph.	BM	AUGUST
	3.CardiovascularsystemNo.ofHours12Structureofheart,artery,veinand capillary, Properties of cardiac muscle, Cardiac cycle, cardiac output, heart rate, heart sounds, ECG- normal and abnormal. Systemic and pulmonary circulation.Bloodpressure,pulsepressureRadialpulse,coronarycirculation	BM	SEPTEMBER
	4. Respiratory system No. of Hours 12 Structure of lungs: alveoli and airways. Respiratory volumes and capacities,Mechanics of breathing. Oxygen and carbon dioxide transport, Neural and chemical control of breathing.	BM	OCTOBER
	5. Renal Physiology, skin and body temperature No. of Hours 12 Anatomy of renal system: kidney, ureter, urethra and urinary bladder, Nephron: structure, JuxtaglomeralarapparatusGFR and GFI, Tubular functions,Urine formation: Counter current exchanger and multiplier. Role of kidneyin	BM	NOVEMBER
	water and electrolyte balance. pHregulation by kidney. Structure of skin. Sweatandsweatglands.Sebum.Corebodytemperature,heatlossand heat gain, Regulation of bodytemperature.		
	INTERNAL SCRIPTS WILL BE CHEKED BY: SS, BG.GCMS		
	FNTACOR02P:PHYSIOLOGYINNUTRITION(PRACTICAL)TOTALHOURS :602 CREDITS 1. Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method)	MS	September
	2. Determinationofbloodpressurebysphygmomanometer(Auscultatory method).	MS	September
	3. InterpretetationognormalECGcurvewith6chestleads.		October
	4. MeasumementofPeakExpiratoryflowrate.(Byspirometer)		November
	5. DeterminationofBleedingTime(BT)andClottingTime(CT).		

	6. Detection of Blood group (Slidemethod). 7. HAEMOGLOBINESTIMATION **INTERNAL SCRIPTS WILL BE CHEKED BY: SS AND MS** FNTGCOR01T:FOODANDNUTRITION(THEORY)TOTALHOURS:60CREDITS: 4 1. Introduction to Food and Nutrition No. of Hours 4 Definition of Food, Nutrition,Nutrient,Nutritionalstatus,Dietetics,Balancediet,Malnutrition, Energy (Unit of energy – Joule,Kilocalorie). 2. FoodandNutrientsNo.ofHours8Carbohydrate,Protein,Fat,Vitamins and Minerals (calcium, phosphorus, sodium, potassium, iron, iodine, fluorine)-sources,classification,functions,deficienciesofthesenutrients. Functions of water and dietaryfibre. 3. FivefoodgroupsNo.ofHours10Basic5foodgroups:Types,composition, nutritional significance, role of cookery of cereals, pulses, milk & milk products,meat,fish,egg,vegetables&fruits,nuts,oil&sugar. 4. FoodChemistryNo.ofHours10Chemistryofcarbohydrate,protein sand fats. Vitamins andminerals 5. Nutrients Metabolism No. of Hours 15 Elementary idea of metabolism, enzymesandhormones-nameandtheirimportantfunctions.Metabolisminbrief(Glycolysis,Glycogenesis,Gluconeogenesis,Cori'scycle,Kreb'scycle, Deamination, Transamination. Role of hormones in carbohydrate metabolism.	BM MS MS BG GC	NOVEMBER JULY AUGUST-SEPTEMBER JULY-AUGUST JULY-SEPTEMBER

	6.BasicMetabolismRate(B.M.R)No.ofHours6B.M.R:Definition,factors affecting B.M.R. and Total Energy Requirement (Calculation of energy of individuals).8 7. Deficiency diseases No. of Hours 7 Deficiency diseases (Nutritional anaemia, PEM, IDD, VAD)-Aetiology, Prevalence, Clinical findings, Prevention & Treatment. **INTERNAL SCRIPTS WILL BE CHEKED BY: BG AND GC** FNTGCOR01P: FOOD AND NUTRITION (PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 1. Elementary idea of weights & measures.	BG GC BG	OCTOBER OCTOBER-EMBER AUGUST

	2. Preparation of cereals, pulses, vegetable, egg, milk, fish, nuts dishes. 3. Planning and preparation of diet of an adult male/female. 4. Planning of a day's diet for pregnant & lactating mother. 5. Preparations of supplementary foods for infants. **INTERNAL PRACTICAL :- SS** **NOTE:- ALLTHESYLLABUSMUSTBECOMPLETEDTENTETIVELYWITHIN:- FEBRUARY2021**	SS GC BG BG	October November OCTOBER-EMBER SEPTEMBER

ACADEMIC CALENDER

DEPARTMENT – FOOD AND NUTRITION

SESSION – 2018-2019

PART – II

PAPER - III (Unit – I & II)

FULL MARKS-50+50

SESSION	TOPIC	TEACHER
Term 1, Half 1, (September-October)	**COMMUNITY NUTRITION** **(UNIT-I)** 1. **Introduction to community nutrition**. Concept of community. Characteristics of community, Types of community. Different factors affecting health of the community (like social, cultural, economic, political and	SS,MS,GT

	environmental factors). 9. **Nutritional intervention program** to combat malnutrition. 10. **Nutrition Education**: (elementary idea) Reason for Nutrition Education, objectives. **PUBLIC HEALTH & EPIDEMIOLOGY** **(UNIT-II)** 1**. Health & its dimensions:** definition of health, different 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 rate. Brief idea about epidemiology of nutritionally related diseases (amoebiasis, hyperlipidaemia, clotting disorder, beriberi, rotaviruus infection). 7. **Communityfoodprotection:** Epidemiology of food borne diseases. Mode of transmission. Prevention & control (Salmonellosis, Shigellosis, typhoid, botulism, Cholera, E.coli food poisoning, Staphylococcal food	

	poisoning).	
Term 1, Half 2 (November-December)	**<u>COMMUNITY NUTRITION</u>** 2**. Direct nutritional assessment of human**: Nutritional anthropometry, Clinical signs, Biochemical and Biophysical methods. 3. **Nutritional Anthropometry**: its need and importance in brief. Parameters of nutritional anthropometry and techniques of measurement. Growth chart and its usage. 4. **Clinical Signs**: its need and importance in brief. Clinical signs of PEM, vitamin A deficiency, IDD, Anemia. 5. **Diet Survey**: its need and importance in brief. Important factors for diet survey in brief (like trained personnel, sampling, method etc).	SS,MS,GT

	Different methods for conducting diet survey. Concept of consumption unit. Adequacy of diet with respect to RDA. Food security. 7. **Concept of surveillance**: food and nutrition surveillance, need for surveillance, objectives of surveillance, indicators of nutritional surveillance, importance and use of surveillance. **PUBLIC HEALTH & EPIDEMIOLOGY** 3**. Public health & epidemiology:-** definitions, Components of epidemiology and aims, different tools & measurements of epidemiology. Brief idea about epidemics. Epidemiological methods: analytical epidemiology - case control & cohort study, epidemics and its types, vital statistics, epidemiological triad, demography and life expectancy. 4**. Communicable & infective disease control:** definitions related to communicable diseases. Infection, contamination, decontamination, disinfection, transmission (direct & indirect) brief idea about different vector borne diseases- brief idea about AIDS, malaria, poliomyelitis, dengue,	

	tuberculosis, MMR, chicken pox, pertussis, chikungunya, epidemiological principles of disease prevention and control	
Term 2, Half 1 (January-February)	**COMMUNITY NUTRITION** 6**.** **Malnutrition**: its sociological factors. Food production and availability, socio-economic factor, cultural influence, food consumption, population problem with respect to food production and availability, medical and educational services, psychological factor, emergency and disaster condition. Prevention of malnutrition. 8. **International, national, regional Agencies and Organizations** : WHO, FAO, CARE,UNICEF, International Red Cross, NIN, ICMR, ICAR,CFTRI, FNB, NNMB, Indian Red Cross, CSWB, Nutrition Foundation of India. **PUBLIC HEALTH & EPIDEMIOLOGY** **5. Immunization:-** Definition**.** Host defenses and immunity. Immunizing	SS,MS.GT

	agents: its types. National immunization schedule- its importance. Immunization for adults & foreign travelers. Hazards of immunization. Health advice to the foreign travelers. **6. Community water & waste management:** Importance of water to the community. Sources of water. Concept of water pollution. Purification of water in small & large scale. Drinking water handling & safe drinking water. Water borne diseases (diarrhea, dysentery, arsenic toxicity). **Waste**-Types and methods of disposal, sewage disposal and treatment, Treatment and disposal technologies of health care wastes.	
Term 2, Half 2 (March)	Revision Classes are held (Theory and Practical)	2nd year Test Exam

ACADEMIC CALENDER

DEPARTMENT – FOOD AND NUTRITION

SUBJECT- FNTA

SESSION – 2018-2019

PART – II

PAPER - IV (Unit – I & II)

FULL MARKS (50+50)

SESSION	TOPIC	TEACHER
Term 1,Half 1, (September-October)	**FOOD COMMODITIES** **UNIT-I** 1. **Cereals & their products**: Structure, nutritive value of cereals. Rice - composition, processing, Brief idea about different fermented rice products. Wheat: - composition, processing. Brief idea about different wheat products - millet like Jowar, Ragi, Bajra. Role of cereals in cookery. Gelatinization, Gluten formation. Breakfast cereal. 2. **Pluses**: composition, nutritive value, processing (soaking, germination, fermentation). Toxic constituent present in pulses. Pulse cookery. Factors affecting cooking quality. Role of pulses in cookery.	DP,BG

	3. **Milk and milk products**: composition of milk. Nutritive value of milk. Physical properties of milk. Pasteurization of milk. Microbial spoilage of milk. Effect of enzyme, acid and heat on milk. Role of milk in cookery. Different fermented milk products like cheese, butter, curd. Brief idea about different non fermented milk products like ice cream, skimmed milk, toned milk, double toned milk, sweetened condensed milk, recombined milk etc. 4. **Egg:** Structure, nutritive value, composition. Effect of heat on egg, and factors affecting coagulation of egg protein. Hard and soft egg. Egg foaming and factors affecting egg foaming. Preservation of egg, Role of egg in cookery. **Community Nutrition (Practical)** **(UNIT – II)** 1.Anthropometric Measurement of infant- Length, Weight, Circumference, Chest, Mid- upper arm circumference, precautions to be taken. Comparison with norms and interpretation of the nutritional assessment date and its significance. Weight for age, height for age, weight for	

	height, Z scores body Mass Index (BMI), Waist-Hip Ratio (WHR).	
Term 1,Half 2 (November-December)	**FOOD COMMODITIES** 5. **Meat, Fish, Poultry:** classification of meat. Nutritive value of meat. Ageing, tenderization, artificial tenderization, curing of meat. Smoking of meat Fish:-composition, nutritive value, selection .spoilage of fish.Poultry:-processing, classification, composition. 6. **Vegetables and Fruits:** classification of Vegetables. Nutritive value, composition of vegetables. Vegetable cookery. Effect of cooking on pigments present in vegetables. Loss of nutrient during cooking. Prevention of loss of nutrient. Storage of Vegetables. Classification of Fruits. Nutritive value, composition of Fruits. Pigments present in fruit. Bitterness in fruit. Ripening of fruits: Browning reaction. 7. **Sugar and its products:** Properties of sugar. Different sugar and their product. Crystallization of sugar. Factors affecting crystallization. Brief idea about different crystalline and non-crystalline	DP,BG

	candies. Caramelization. Role of sugar in cookery. Different natural and artificial sweeteners. 8. F**ats and Oils:** Classification & Nutritive value of fatsandOils. Different fatty acids. Structure of fat. Composition of fat. Chemical properties. Analysis of fats & oils. Degradation of fat, factors affecting it & its prevention. Smoking temperature of fat. 9. **Food Preservation:** Objectives of preservation in brief. Different methods of preservation. Basic idea of food spoilage. Preparation of preserved products like jam, jelly, squash, pickles etc. **Community Nutrition (Practical)** 2.Growth charts-plotting of growth charts, growth monitoring and promotion. 3.Clinical assessment and signs of nutrient deficiencies, Anaemia, Rickets, B-Complex deficiencies. 4.Estimation of food and nutrient intake-Household food consumption data, per 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.	
Term 2, Half 1 (January-February)	**FOOD COMMODITIES** 10. **Food Additives:** Brief idea about food additives. 11. **Leavening agent:** Brief idea about different leavening agent like baking powder, egg etc. 12. **Food adulteration & Food Standards:** Different food standards: BIS, Agmark, FPO, PFA, MPO etc. basic idea about food adulteration, quality. Factors responsible for food adulteration. 13. **Convenience Food:** Basic idea, types, role of convenience food. 14. **Spices:** Different spices, their composition, medicinal value & use. Basic idea about herbs. 15. **Beverages:** Classification Tea: nutritional aspect, classification, processing of tea, different types of tea. Coffee: composition, processing, nutritional aspect of coffee. Bitter substances present in coffee, different coffee products. Chocolate & cocoa: processing, composition & nutritional	DP,BG

	aspect. Alcoholic beverages: beer, rum, wine- their processing. Carbonated beverages. **Community Nutrition (Practical)** 5.Community field survey.	

ACADEMIC CALENDER

DEPARTMENT – FOOD AND NUTRITION

SUBJECT- FNTA

SESSION – 2018-2019

PART – III

PAPER - V

SESSION	TOPIC	TEACHER
Term 1,Half 1, (July-October)	**Unit I:- Nutritional Biochemistry (50)** **1.ENZYMES & COENZYMES:ENZYMES:** Definition & Classification, Kinetics (Gibbs free energy change, Reaction initiation energy), Michalies-Menten equation, Reciprocal plot & its significance, Vmax & Km, substrate specificity, enzyme inhibition (irreversible- Penicillin inhibition, reversible explained from Reciprocal plot, allotter-ribonucleotide reductase inhibition by nucleotides), isozymes-ex. LDH. **COENZYMES:** Definition, Biochemical Functions of: NAD, NADP, FAD, CoA, Tetrahydrofolate, TPP. Names of the Vitamines present in those coenzymes,	MRS,DP

	2.CARBOHYDRATES: Glycolysis, Citric acid cycle, Electron transport chain (brief idea), glycogenesis, glycogenolysis, gluconeogenesis.HMP Shunt. **3.LIPID:** Beta-Oxidation, (alpha and omega oxidation-definition only), Synthesis & utilization of ketone bodies, Ketosis, Causes of fatty liver. **Unit II:Food Microbiology**(50) **1.Microscope: -** Different parts of microscope and its functions. **2.Cultivation of Bacteria**:-Nutritional requirements of micro-organisms, types of growth media (selective, differential, enrich media-definition with example), Pure culture methods (streak pl spread plate pour plate, slant culture), Anaerobic cultivation of bacteria. **3.Growth of Bacteria**:-Definition, growth phase, direct and ind measurement of growth, Factors affecting growth (pH, temp and oxygen).	
Term 1,Half 2 (November-December)	**NUTRITIONAL BIOCHEMISTRY- UNIT-I** **4.PROTEIN:** Tertiary & Quaternary structures of protein with Haemoglobin & Collagen as examples, Deamination & Transamination, amino acid metabolism. **5.NUCLEIC ACID :** Structure of Purines & Pyrimidines, Nucleosides & Nucleotides, Formation of Nucleic Acid	MRS,DP

	Chain from Nucleotides, Importance of Thymine in DNA structure, Types of RNA & their functions (in brief), Structure of t-RNA, Codons, Definition of Central Dogma(Replication, Transcription, Translation - elementary idea only) & Machineries needed in each step(only names of the enzymes and coenzymes). **FOOD MICROBIOLOGY UNIT-II** **4.Stain and staining techniqu**- dye (Chromophore, auxochrome-definition with example). Classification of stains, principles of staining, simple staining, negative staining, differential staining (Gram staining and acid fast staining). **5. Morphology of Bacteria**:- slime layer, capsule, cell wall, flagella, pili, fimbriae, cell membrane, ribosome, cytoplasmic inclusions(inorganic), endospore (structure, formation and germination).. **6.Control of microbes**:-Sterilization, Disinfection, Antiseptics, detergents, Methods of sterilization-Physical (heat, low temp, radiation, filtration). Chemical (alcohol, phenol, halogen, heavy metals, formaldehyde).	

Term 2, Half 1 (January-March)	**NUTRITIONAL BIOCHEMISTRY UNIT-I** **6. VITAMINES:** Structure & Biochemical roles, Deficiency disorders of Vitamin **A, D, E.K, B_1, B_2, B_6,** Folic acid, Pantothenic acid, Niacin & Vitamin C. **7.MINERALS:** Biochemical functions of Na, K, Ca, P, I, Fe, Se - Disorders related to Hyperactivity & Deficiencies of those elements. **8.CELLULAR TRANSPORT:** Preliminary idea about membrane permeability, Active & Passive transport, Facilitated transport, a brief idea about gated-channels & membrane-bound transport protein. **FOOD MICRIBIOLOGY UNIT-II** **7.FOOD MICROBIOLOGY:-** milk as a growth medium of bacteria, normal microflora in milk, undesirable microbes in milk,Pasteurisation, phosphatase test, Methylene blue reduction test.Normal microflora of vegetables & fruits, meat, fish, egg, canned food, cereal &cereal products, enumeration of microbes present in food & milk. Outline of methods for detection of microorganisms in drinking water (presumptive, confirmatory and completed test).distinction between faecal and non faecal coliforms- IMVic test.Extrinsic & intrinsic parameters affecting growth & survival of microbes.	MRS,DP

	8.<u>Food borne diseases</u>: - Food borne infection & intoxication. Different food borne diseases like Shigellosis, salmonellosis, *Clostridium Perfringens* food poisoning, Typhoid, *E.Coli* food poisoning, *Bacilluscereus* food poisoning-causative agent, symptoms, pathogenicity & preservation.	

ACADEMIC CALENDER

DEPARTMENT – FOOD & NUTRITION

SUBJECT- FNTA

SESSION – 2018-2019

PART – III

PAPER - VI (UNIT I&II)

FULL MARKS: 50+50

SESSION	TOPIC	TEACHER
Term 1,Half 1, (July-October)	**<u>DIET THERAPY UNIT-I</u>** **<u>1.Basic concept of diet therapy</u>: -** different definitions related to diet therapy. **<u>2.Routine Hospital Diet:-</u>**Modification of normal diet into therapeutic diet. Purpose of diet therapy. Different modifications. **<u>3.Diet with Energy Modification: -</u>** Energy	SS,BG,MS

	modification & nutritional care for weight management, identifying the overweight obese, aetiological factors contributing obesity, prevention & treatment of obesity. Low energy diet & balanced energy reduction. Underweight - aetiology, an assessment, high energy diets for weight gain. **DIET THERAPY UNIT II** **1. DIABETES MELLITUS:** General introduction & classification, Factors responsible for diabetes, Role of hormones, Characteristics of typeI &type II diabetes, Treatment & dietary management of diabetes, Complications associated with it. **2. FOOD ALLERGY:-** Introduction & definition related to food allergy, Predisposing factors of food allergy,Reasons for allergy, Classification of allergy, Allergic reaction (elementary idea), Symptoms of allergy, Role of food as allergen, Treatment & dietary management of food allergy, with elimination diet.	

Term 1,Half 2 (November-December)	**DIET THERAPY UNIT-I** **4.DIET FOR FEBRILE CONDITION**:- Different causes of fever, Metabolic changes during fever (elementary idea), General dietary consideration, Causes, clinical features, treatment& dietary management of- Short time fever(influenza), Chronic fever (tuberculosis), Intermittent fever (Malaria). **5.DIET DURING SURGERY:-** General introduction, Pre & post operative diet (brief idea), Dietary management. **6.DISEASES OF LIVER:-** General introduction, Symptoms of liver disease, Reasons of liver diseases, Basic idea of liver function tests, Causes, clinical features, treatment& dietary management of- Infective hepatitis & jaundice, Cirrhosis of liver, Hepatic coma, Infantile billiary cirrhosis. **DIET THERAPY UNIT II** **3.CARDIO VASCULAR DISEASES**: General information & brief idea, Causes or	SS,BG,MS

	factors of CHD in brief, Dietary management, symptoms in brief of the following: atherosclerosis, hypertension, hypercholesterolemia, IHD, Congestive cardiac failure.	
Term 2, Half 1 (January- March)	**DIET THERAPY UNIT I** **7.GALL STONE DISEASE:**General introduction, Type of stones, Dietary management. **8.PEPTIC ULCER:-**General introduction of peptic ulcer disease,Causes of peptic ulcer disease, Mechanism of ulcer formation, Symptoms of peptic ulcer disease,Treatment & dietary management. **9.INTESTINAL DISORDERS:**-General introduction and dietary management of different intestinal disorders-**Constipation**:- causes, complication, type (in brief), Dietary management.**Flatulence:-**causes, treatment, dietary management. **Diarrhoea:-**causes, physiological disturbance in the body during Diarrhoea. Different types of Diarrhoea, Symptoms, Complication. Prevention & treatment.ORS. **Steatorrhoea: -** causes, treatment, dietary management. **Ulcerative colitis**-causes, symptoms, treatment & dietary	SS,BG,MS

	management. **Irritable bowel syndrome**: - causes, symptoms, dietary management. **DIET THERAPY UNIT II** **4.RENAL DISEASES:-** General introduction. Causes, symptoms in brief & dietary management of the following: Type I or Glomerulonephritis, Type II or Nephrotic Syndrome, Acute & chronic renal failure, Renal calculi.	

ACADEMIC CALENDER

DEPARTMENT –FOOD & NUTRITION

SUBJECT- FNTA

SESSION – 2018-2019

PART – III

PAPER -VII UNIT- I& II

FULL MARKS- 50+50

SESSION	TOPIC	TEACHER
Term 1,Half 1, (July-October)	**NUTRITIONAL BIOCHEMISTRY UNIT I** GROUP A:-QUALITATIVE ESTIMATION 1. Qualitative estimation of	MRS,SS

	Carbohydrate(Mono,di and poly saccharides) Glucose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2.Colour reactions of Protein GROUP B:- QUANTITATIVE ESTIMATION 1. Standard curve of Protein by Biuret method using BSA. 2. Standard curve of Protein by Folin Phenol method using BSA. 3. Estimation of unknown Protein from egg or serum protein. **FOOD PRESERVATION UNIT II** 1. Introduction to food preservation and different methods of food preservation. Purpose of food preservation. 2. Use of natural and chemical preservatives in preparation of different preserved products: Jam, Jelly, Squash, Pickles, Murabba etc.	
Term 1,Half 2 (November-December)	**NUTRITIONAL BIOCHEMISTRY UNIT I** GROUP A- QUALITATVE ESTIMATION 3.Qualitative estimation of Fat.Solubility test, Unsaturation test, Saponification test, Test with soap & acrolin layer.	MRS,SS

	GROUP B:- QUANTITATIVE ESTIMATION 4.Standard curve of PNP 5.Preparation of Buffer. 6.Quantitative estimation serum acid phosphatase. 7.Quantitative estimation serum alkaline phosphatase. **FOOD PRESERVATION UNIT II** 3.Use of sun drying for preservation of food. 4.Preparation of fermented food product.	

Term 2, Half 1 (January- March)	**NUTRITIONAL BIOCHEMISTRY UNIT I** GROUP A- QUALITATIVE ESTIMATION 4.Chromatographic separation of Amino Acids from mixture of amino acids & determination of Rf value. GROUP B:- QUALITATIVE ESTIMATION 8.Quantitative estimation of vitamin C in lemon juice. 9.Quantitative estimation of glucose using fehling solution. 10.Determination of acid value of fat. **FOOD PRESERVATION UNIT II** 5.Visit:- Milk industry visit Food testing lab visit.	MRS,SS

ACADEMIC CALENDER

DEPARTMENT – FOOD & NUTRITION

SUBJECT- FNTA

SESSION – 2018-2019

PART – III

PAPER - VIII UNIT I, II,III

FULL MARKS: 35+30+35

SESSION	TOPIC	TEACHER
Term 1,Half 1, (July-October)	**DIET THERAPY PRACTICAL UNIT I** 1.Introduction to therapeutic nutrition, its objectives. Different modification techniques (demonstration). 2. Planning and preparation of normal diet. 3.Planning and preparation of clear fluid and full fluid diet. 4. Planning and preparation of soft diet. **FOOD MICROBIOLOGY UNIT II** 1.Basic idea of process of sterilization. 2.Preparation of Nutrient agar media. **PROJECT & SEMINAR UNIT III** 1.Review and project work	GC,DP,MS,SS,MRS,GT
Term 1,Half 2 (November-December)	**DIET THERAPY UNIT I** 5.Planning and preparation of diets for the following condition :Jaundice, Peptic Ulcer, Diabetes, Fever. **FOOD MICROBIOLOGY UNIT II** 3.Inoculation of one gram positive and one gram negative bacteria 4.Gram Staining. **PROJECT & SEMINAR** 1.Review and project work	GT,MRS,DP,SS,GC,MS

Term 2, Half 1 (January- March)	**DIET THERAPY UNIT I** 6 .Planning and preparation of diets for the following condition: CHD, Gout, Renal Failure(acute or chronic),Obesity. **PROJECT & SEMINAR** 2. Seminar presentation.	GT,MRS,DP,SS,MS,GC
Term 2, Half 2 (April-June)	Revision Classes are held	1st year Test Exam

ACADEMIC CALENDER

DEPARTMENT –FOOD AND NUTRITION

SUBJECT: FOOD AND NUTRITION(GENERAL)

SESSION – 2018-2019

PART – II

PAPER -II&III

UNIT-I

SESSION	TOPIC	Teacher
Term 1,Half 1, (July-October)	**UNIT-I** FOOD SCIENCE: 1. Definition of Food, Nutrition, nutrient, health, nutritional status, balanced diet, malnutrition, energy(units) 2. Definition of BMR, Factors controlling BMR, Energy Balance, RDA 3. Basic Five Food groups: Types, Composition, Nutritional significance, role of cookery of Cereals, Pulses, Milk and milk products, Meat, Fish, Egg, Vegetables & fruits, nuts, oils and sugar. **UNIT-II** THERAPEUTIC NUTRITION 1. Basic Concept of diet therapy, Principles and classification of the therapeutic diet **PAPER-III(PRACTICAL)** 1. Elementary idea of weights and measures. 2. Processes involved in food preparations- Boiling, Roasting, Stewing, Poaching, Frying, Grilling, Pressure Cooking(one of each type) 3. Preparation of Supplementary foods for infants(minimum two)	SS,MS,BG
	UNIT-I FOOD SCIENCE:	

Term 1,Half 2 (November-December)	4. Principle and objectives of meal Planning 5. Nutritional requirement(RDA), Dietary guidelines of Pregnant and Lactating Women, Infants (Weaning, Supplementary food),Preschool children, School Children(School Lunch Programme), Adult males, females, Old age people **UNIT-II** THERAPEUTIC NUTRITION 2. Hospital diet: regular, Soft, Fluid, Special Feeding Methods-Advantages and Disadvantages. 3. Dietary management in Gastrointestinal Disease (Diarrhoea, Constipation, Gastritis, Peptic ulcer& Flatulence), Fever(short term), Diabetes Mellitus(Type II-NIDDM), Heart disease (Hypertension, Atherosclerosis, Hyperlipidaemia), Liver Disease (Infective Hepatitis, Cirrhosis of Liver), Gout, Obesity (including assessment indices), Underweight **PAPER-III(PRACTICAL)** 4. Planning and Preparation of Fluid diet, Soft and Semisolid diet(one of each type) 5. Preparation of cereals, Pulses, Vegetables, Egg, Milk, Fish, Nuts (one from each group) 6. Preparation of ORS	BG,SS,MS

Term 2, Half 1 (January- March)	**UNIT-I** FOOD SCIENCE: 6. Deficiency Diseases (Nutritional Anaemia, PEM,IDD,VAD)- Aetiology, Prevalence, Clinical findings, Prevention& treatment **UNIT-II** THERAPEUTIC NUTRITION 4. Food allergy: Definition, Sources, Symptoms, Diagnosis, Treatment, Food Intolerance **PAPER-III(PRACTICAL)** 7. Preparation of Jam, Jelly, Squash, Pickles 8. Planning of a day's diet for a pregnant and lactating mother 9. Planning and preparation of a day's diet for the following conditions- Peptic Ulcer, Fever, Hypertension, Diabetes mellitus(Type-II,NIDDM)	SS,BG,MS

ACADEMIC CALENDER

DEPARTMENT –FOOD AND NUTRITION

SUBJECT: FOOD AND NUTRITION(GENERAL)

SESSION – 2018-2019

PART – III

PAPER -IV

UNIT-I&II

SESSION	TOPIC	Teacher
Term 1,Half 1,	**UNIT-I** Group A- COMMUNITY NUTRITION	SS,MS,BG,DP

(July-October)	1. Concept of Community 2. Methods of assessment of nutritional Status- Anthropometry, Clinical, Biochemical, Diet Surveys, Vital health statistics Group B(Food Microbiology & Sanitation) 1. Elementary structure and characteristics of microbes- Bacteria, Virus, Fungi including Mold, Yeast and Protozoa. 2. Food Spoilage- Cereals, Pulses, Vegetables & Fruits, Milk and Milk Products, Fleshy Foods, Fats and oils **UNIT-II** PRACTICAL: 1. Diet Survey in a household of slum or rural area	
Term 1, Half 2 (November-December)	**UNIT-I** Group A- COMMUNITY NUTRITION 2. Role of National and International Organization in improving Community Health: WHO, FAO, UNICEF,CARE, NIN, CFTRI, ICMR 3. Nutrition Education in community- Definition, Methods, Uses Group B(Food Microbiology & Sanitation) 3. Food Borne infections and infestations- Causative Organisms, Symptoms, Mode of Transmission, Methods of Prevention 4. Food Preservation- Definition, Objectives, Methods- main principle, procedure, common examples **UNIT-II** PRACTICAL: 2. Plotting of Growth Chart	SS,MS,DP,BG

Term 2, Half 1 (January-March)	**UNIT-I** Group A- COMMUNITY NUTRITION 5. Current National Nutrition Intervention Programmes in India- SNP, ANP, ICDS, Mid Day Meal, NIDDCP, NPPNB, NNAPP Group B(Food Microbiology & Sanitation) 5. Food Adulteration- Definition, Types, Intentional adulterants & Method of detection, Food Laws and Food Standards- PFA Act, AGMARK, FPO, MPO, Codex Alimentarius, Consumer Protection Act, HACCP **UNIT-II** PRACTICAL: 3. Identification of unknown microbes(Prepared Slides)	SS,BG,MS,DP

Academic Calendar

Department of Food & Nutrition (Honours)
1st 3rd sem 3rd year 2019 june-december

Semester/ Year	Syllabus Module/ Unit	No of Lectures	Teachers	Weekly Distribution of classes
1st Semester	**FNTACOR01T: HUMAN NUTRITION (THEORY)** 1.Introduction of Food and nutrition 2. Foods, Nutrients and cooking of food 3.Food energy and energy requirements 4. Digestion of Foods **FNTACOR01P: HUMAN NUTRITION (PRACTICAL)** 1. Process involved in cooking, microwave, steaming, grilling, deep fat frying. 2. General concepts of weights and measures, Eye estimation of raw cooked foods 3. Preparation of food from different food groups and their significance in relation to health 4. Preparation of supplementary food from different age group and their nutritional significance 5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child **FNTACOR02T: PHYSIOLOGY IN NUTRITION (THEORY)** 1.Unit of Life: Cell and Tissue Structure 2.Blood and body fluids 3. Cardiovascular system 4. Respiratory system 5. Renal Physiology, skin and body temperature **FNTACOR02P: PHYSIOLOGY IN NUTRITION(PRACTICAL)** 1. Determination of pulse rate in Resting condition and after exercise (30 beats/10 beats method) 2. Determination of blood pressure by Sphygmomanometer	10 10 15 25 60 12 12 12 12 12 60	SS,MS,GC, Dr. M Seth SS, MS MS (Cell), BM BM	SS -1,MS-1, GC-1,Dr. M Seth 1 Total =4 (T) SS-2 MS-2 TOTAL =4 (P) BM-3 TUTORIAL-1 TOTAL=4 (T) BM-2 TUTORIAL-2 TOTAL=4 (P)

Academic Calendar

Department of Food & Nutrition (Honours)
1st 3rd sem 3rd year 2019 june-december

	(Auscultatory method). 3. Interpretetationog normal ECG curve with 6 chest leads. 4. Measumement of Peak Expiratory flow rate.(By spirometer) 5. Determination of Bleeding Time (BT) and Clotting Time (CT). 6. Detection of Blood group (Slide method). 7. Measurement of Haemoglobin level (Sahli`s or Drabkinmethod).			
3rdSemester	**FNTACOR05T: NUTRIENTS METABOLISM(THEORY)** 1.Carbohydrate Metabolism 2. Lipid Metabolism 3.Amino acid Metabolism 4. Biological oxidation 5. Nucleic acid metabolism 6. Vitamins 7.Mineral Metabolism **FNTACOR05P: NUTRIENTS METABOLISM(PRACTICAL)** 1. Estimation of Vitamin C in citrus fruits. 2. Estimation of calcium in blood (using kit) and drinking water (Complexometry). 3. Estimation of sodium and potassium in blood (using kit). 4. Estimation of iron in vegetables by spectrophotometry. 5. Estimation of DNA (PDA method) and RNA (Orcinol method) in tissues by spectrophotometry **FNTACOR06T: NUTRITION THROUGH LIFE SPAN(THEORY)** 1. Basics of Meal Planning 2. Nutrition in Adults and Elderly 3. Nutrition during Pregnancy 4.Nutrition during Lactation 5.Nutrition during Infancy 6. Nutrition for Children and Adolescents **FNTACOR06P: NUTRITION**	14 12 8 8 10 8 60 4 8 13 10 15 10	DM DP DP/DM SS,,GC	DM-4/DP-4 TOTAL =4 (T) DP-2/DM-2 (P) SS-2, GC-2 TOTAL 4 (T)

Academic Calendar

Department of Food & Nutrition (Honours)
1st 3rd sem 3rd year 2019 june-december

	THROUGH LIFE SPAN(PRACTICAL) Meal 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 elderly. **FNTACOR07T: ELEMENTARY DIETETICS AND MENU PLANNING (THEORY)** 1. Dietetics and Dietician 2. Food groups 3. Dietary guidelines 4.Menu Planning 5. Basics of diet therapy 6. Diet for health care 7. Routine Hospital Diet **FNTACOR07P: ELEMENTARY DIETETICS AND MENU PLANNING (PRACTICAL)** 1. Planning and preparation of normal diets. 2. Planning and preparation of different fluid diets. 3. Planning and preparation of different soft/semi solid diets. 4. Planning and preparation of different nutrient modified diet.	60 4 13 6 10 15 5 7 60	GC -2, SS-2 TOTAL =4 (P) MS, GC MS, GC	GC -2, SS-2 TOTAL =4 (P) MS-2, GC-2 TOTAL=4 (T) MS-2, GC=2 TOTAL=4 (P)
3rd Year	**Paper-5 Unit (i): Nutritional Biochemistry** 1. Enzymes and Co Enzymes 2. Carbohydrates 3. Lipid 4. Protein 5. Nucleic Acid 6. Vitamins 7. Minerals 8. Cellular Transport		DP/DM	DM:-4/DP-4

Academic Calendar

Department of Food & Nutrition (Honours)
1st 3rd sem 3rd year 2019 june-december

	Unit (ii): Microbiology 1.Microscope 2. Cultivation of Bacteria 3. Growth of Bacteria 4. Stains and Staining techniques 5. Morphology of Bacteria 6. Control of Microbes 7. Food Microbiology 8. Food borne diseases		DP/DM	1
	Paper-6 Unit (i): Diet Therapy (i) 1. Basic concept of Diet Therapy 2. Routine hospital diet 3. Diet with energy modification 4. Diet for febrile condition. 5. Diet during surgery. 6. Diseases of Liver. 7. Gallstone disease. 8. Peptic Ulcer. 9. Intestinal Disorders.		SS	2
	Unit (ii): Diet Therapy (ii) 1Cardiovascular Diseases. 2. Renal Diseases. 3. Diabetes Mellitus. 4.Food Allergy		MS	2
	Paper-7 Unit (i): Biochemistry Practical GR:A Qualitative Estimation GR:B Quantitative Estimation		DP/DM	2
	Unit (ii): Food preservation and preparation		SS, MS	SS-2, MS-2
	Paper-8 Unit (i): Diet therapy Practical		GC	GC-2
	Unit (ii) Microbiology Practical		DP/DM	2

Academic Calendar

Department of Food & Nutrition (Honours)
1st 3rd sem 3rd year 2019 june-december

	Unit (iii) Project and Seminar		SS, MS ,GC, DP, GT	

P.S. Distribution denotes tentative time of completion of the syllabus.

Academic Calendar

Department of Food & Nutrition(H&G)
2020 1ST , 3rd, 5thsem , CBCS

Semester/ Year	Syllabus Module/ Unit	Teachers	Tentative period of completion
3rd H	**FNTACOR05T: NUTRIENTS METABOLISM(THEORY)**		September
	1.Carbohydrate Metabolism: Glycolysis & its regulation. Glycogen metabolism. Metabolism of pyruvate. Outline ofpentose phosphate pathway. Anaplerotic reactions. Importance of gluconeogenesis.	Debasish mazumdar	
	2. Lipid Metabolism : Fatty acid synthase and de novo biosynthesis of fatty acid; regulation and mechanism of chain elongation. Metabolism of cholesterol, its control and pathophysiological importance. β-oxidation of fatty acids.	Debasish mazumdar	Septemb er- October
	3.Amino acid Metabolism : Essential amino acids. Transamination. Deamination. Transmethylation. Decarboxylation.glucogenicandketogenicaminoacids.Outl ineof urea cycle. Inborn errors of Metabolism.	Debasish mazumdar	Novemb er
	4. Biologicaloxidation Mitochondrial electron transport chain. High energy phosphate bond.Formation of ATP.	Debasish mazumdar	
	5. Nucleic acid metabolism Chemical structure of purine and pyrimidine, Catabolism and anabolism of pyrimidines. Gout - occurrence, prognosis, progression and therapy.	DP	Novembe r- Decembe r
	6.Vitamins Classification, charcateristics and chemical properties of fat and water soluble vitamins. Functions of fat and watersolublevitamins.Hypervitaminosis.RoleofvitaminsA ,D,C, B1, B2B6, B12 and folic acid inmetabolism.	DP	December
	7.Mineral Metabolism Role of minerals in physiology. Trace elements. Sodium potassium balance. Role of calcium, iron and zinc in human body -metabolism, functions, deficiency and toxicity.	DP	January
	Internal exam Scripts will be checked by :- SRI DEBASISH MAZUMDAR& DP		

	FNTACOR05P: NUTRIENTS METABOLISM(PRACTICAL) TOTA HOURS: 60 2 CREDITS 1. Estimation of Vitamin C in citrus fruits. 2. Estimation of calcium in blood (using kit) and drinking water (Complexometry).3.Estimationofsodiumandpotassiumin blood(usingkit).4.Estimationofironinvegetablesby	DEBOSMITA PATHAK	September -November

	spectrophotometry.5.EstimationofDNA(PDAmethod)and RNA(Orcinolmethod)intissuesbyspectrophotometry. INTERNAL PRACTICAL MARKS WILL BE GIVEN BY : SMT DEBOSMITA PATHAK **FNTACOR06T: NUTRITION THROUGH LIFE SPAN(THEORY)**		
	1. Basics of Meal Planning Principles of meal planning,Food groupsandFoodexchangelist,Factorsaffectingmeal planningand food relatedbehaviour	SS	September
	2. Nutrition in Adults and Elderly Physiological changes in elderly..RDAandnutritionalguidelines,nutritional concernsand healthyfoodchoicesfor:Adultmanandwoman,Elderly.	**MS**	September
	3. Nutrition during Pregnancy Nutrition During Pregnancy: Factors (non-nutritional) affecting pregnancy outcome, importance of adequate weight gain during pregnancy,antenatal careanditsschedule,Nutritionalrequirementsduringpregnancy andmodificationofexistingdietandsupplementation,Deficiency of nutrients, specially energy, iron folic acid, protein, calcium, iodine. Common problems of pregnancy and theirmanagements, specially - nausea, vomiting, pica, food aversions, pregnancy inducedhypertension,obesity,diabetes.Adolescent pregnancy.	SS SS M.SINHA	September-er
	4.NutritionduringLactation Nutrition during Lactation: Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation.Care and preparation of nipples during breastfeeding.		October
	5.Nutrition during Infancy Nutrition during Infancy: Infant physiologyrelevanttofeedingandcare,Breastfeeding,colostrum, its composition and importance in	M.SINHA	October

	feeding, Initiations of breast feeding.Advantagesofexclusivebreastfeeding.Basic principlesof breastfeeding.Introductionofsupplementaryfoods, initiationand 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,Management of pretermand low birth weightbabies. **6. Nutrition for Children and Adolescents** **INTERNAL SCRIPTS WILL BE CHEKED BY: SS AND MS**		

Academic Calendar

DepartmentofFood&Nutrition(Honours)

2020-21 1ST ,3rd , 5th sem , CBCS

	FNTACOR06P: NUTRITION THROUGH LIFE SPAN(PRACTICAL) TOTAL HOURS: 60 2 CREDITS Meal planning and preparation of adequate meal for different agegroupswithspecialreferencetodifferentphysiological conditions: infants, pre-schooler, school children, adolescents, adults, pregnancy, lactation andelderly. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY: SS AND MS**	MS & SS	**September-November**
	FNTACOR07T: ELEMENTARY DIETETICS AND MENU PLANNING (THEORY)		
	1. DieteticsandDietician Definition and objective of dietetics, Dieticians-Definition, Classification andResponsibility	BG	**September**
	2.Foodgroups Four food groups (Caribbean Food Guide; Canadian Food Guide; USA Food Pyramid; British Food Guide; Recommended Nutrient Intake (RNI); Dietary Value Intake; Dietary Reference Value, Five food group system of ICMR. Structure and composition of cereals. Wheat- structure and composition, types (hard, soft/ strong, weak) ,Diagrammatic representation of longitudinal structure of wheat grain. Malting, gelatinization of starch, types of browning- Maillard&caramelization. Rice- structure and composition, parboiling of rice- advantages and disadvantages. Structure and composition of pulses, toxic constituents in pulses, Milk andMilk Products- composition, classification and processing, Eggs- com[position, Meat, fish & poultry- Types, composition, Sugar& Sugar products-Types and composition, Fats & Oils-Types & sources, Food adjuncts- spices, condiments, herbs, extracts;concentratesessences,foodcolours,origin,classification, convenience foods, Bevarages-Tea, Coffee, Chocolate , cocoa poeder-composition	BG	**September -November**
	3.Dietaryguidelines Nutritive values as a basis for classificationof food, Recommended Daily Allowances (RDA), Dietary guidelines for Indians and foodpyramids.	GC	September

	4.MenuPlanning Menu Planning: Rationale for menu planning, Factors affecting food choice, Nutritional factors,other factors; Exchange list and food composition tables for menu planning, Steps in the development of exchange list, Factors tobe considered when planning the regular balanced diet: adequacy, balance caloric control, moderation, variety andaesthetics.	SS	**September**

Academic Calendar

DepartmentofFood&Nutrition(Honours)

2020-21 1ST ,3rd , 5th sem , CBCS

	5. Basics ofdiettherapy Basic concepts of diet therapy: Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets, Nutrientmodifications.	GC	**September**
	6. Diet forhealth care Team approach to health care. Assessment of Patient'sneeds.	GC	October
	7. RoutineHospitalDiet Routine Hospital Diets: Regular,light, soft, fluid, parenteral and enteral feeding. **INTERNAL SCRIPTS WILL BE CHEKED BY: BG AND GC**	GC	October
	FNTACOR07P: ELEMENTARY DIETETICS AND MENU PLANNING (PRACTICAL) TOTAL HOURS: 60 4 CREDITS 1. Planning and preparation of normaldiets. 2. Planning and preparation of different □uiddiets. 3. Planning and preparation of different soft/semi solid diets. 4. Planning and preparation of different nutrientmod□eddiet.	BG GC	September- November
	INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :-BG AND GC		
	SEC SYLLABUS		
	FNTSSEC01M: INSTRUMENTATION **1.Microscopy Brightfield and darkfield microscopy, Optical Microscopy, Phase contrast Microscopy, Inverted Microscopy**	M.SINHA	Septembe r
	2. Chromatography Principles and applications of paper chromatography (including Descending and 2-D), Thin layer chromatography, HPLC. Separation of mixtures by paper / thin layer chromatography	DP	September
	3. Spectrophotometry Principle and use of study of absorption spectra of biomolecules, Analysis of biomolecules using UV and visible range, Colorimetry. Protein concentration of spectrophotometer/ colorimeter.	**DP**	October
	4. Electrophoresis Principle and applications of native polyacrylamide gel electrophoresis	BG	November
	5.Centrifugation Preparative and analytical centrifugation, densitygradientcentrifugationandultracentrifugationSeparation	GC	October

	of components of a given mixture using a laboratory scale centrifuge		
	6. ECG and EEG Principles of ECG and EEG, application of ECG and EEG	**M.SINHA**	**November**
	7. ELISA Principle and applications of ELISA test	SS	September
	INTERNAL SCRIPTS WILL BE CHEKED BY: GC		
			September
	3RD SEM G (DSC) **FNTGCOR03T: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT (THEORY)** **1. Concept on Community Concept and types of Community. Concept of community nutrition, Community health, Factors affecting community health.**	MS	
	2. Nutritional AssessmentNutritional Assessment: Meaning, need, objectives and importance. Method of assessment of nutritional status – Anthropometry, Clinical, Biochemical, Dietary surveys, Vital healthstatistics.	SS	**Septem ber**
	3. Concept of surveillance system 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.	M.SINHA	October
	4. Nutrition InterventionProgrammes Current National Nutrition Intervention Programmes in India- SNP, ANP, Midday meal,	SS	October
	NIDDCP, NPPNB, NNAPP. ICDS,	M SINHA	November
	5. Nutrition Education Nutrition Education: Definition, objectives of nutrition education. Methods of imparting nutrition education.	SS	November
	INTERNAL SCRIPTS WILL BE CHEKED BY: BG AND MS		
	FNTGCOR03P: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT(PRACTICAL) TOTAL HOURS: 60CREDITS: 2 1. Anthropometric Measurement of infant - Height,	GC	September - November

	weight, circumference of chest, mid - upper arm circumference. Calculation of BMI. 2. Clinical assessment and signs of nutrient de ciencies. 3. Diet survey by 24 hours recallmethod. 4. Preparation of homemade ORS. 5. Preparation of low cost and medium cost schooltif n. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :GC** **5TH SEM H** **FNTACOR11T: CLINICAL NUTRITION AND DIET FOR SPECIAL SITUATIONS IN LIFE (THEORY)**		
	1. Nutritional management of physiological stress Nutrition in wound healing, Surgery: Pre and post surgical dietary management, Burns, Classification, Complication, Dietary management, Trauma: Dietary management, Sepsis: Dietary management.	BG	September
	2. Dietary Modification in febrile Condition Acute, chronic and recurrent fevers, typhoid, rheumatic fever, tuberculosis, malaria, H1N1, dengue fever and chikunguinea.	BG	September
	3. Nutritional management of GI diseases Diseases of Esophagus and stomach: Esophagitis(GERD), Dyspepsia, Peptic ulcer, Gastritis, Gastrectomy, Dumping syndrome . Intestinal diseases: Flatulence, Diarrhea, Constipation, Hemorrhoids, Diverticular disease, Duodenal ulcer, Inflammatory Diseases of Bowl: Crohn's disease and ulcerative colitis, IrritablebowlSyndrome, Colostomy,Ileostomy	BG	October-November
	4.Malabsorption syndrome Celiac disease (Tropical sprue),Steatorrhoea, Intestinal Brush border diseases,Protein losing enteropathy	SS	September
	5. Diseases of Gall bladder andpancreas Pathophysiologic changes, etiology and dietary management -(Biliary dyskinesia , Cholelithiasis, Cholecystitis, Cholecystectomy ,Pancreatitis)	SS	October
	6. Liver diseases Pathophysiology,Progression of liver disease, Role of specific nutrients and alcohol in liver diseases. Nutritional care in liver disease in the context of results of specific liver function tests, Viral hepatitis , cirrhosis of Liver, Hepatic encephalopathy, Wilsons disease.	SS	November

	7. Nutrition Management of Renal Disease Etiology and pathogenesis, Clinical and metabolic manifestations Diagnostic tests, Acute and chronic nephritis, Nephrotic syndrome, Renal Failure: Acute and chronic, Nnephroletheasis,ESRD	GC	September
	8. Nutritional management in Allergy Definition, symptoms mechanism of food allergy, Biochemical and immune testing (short), Elimination diets, Food selection, Food allergy in infancy: Milk sensitive enteropathy, intolerance to breast milk, Prevention of food allergy.	GC	September
	9.Neurological diseases Alzheimer's, Parkinson's disease and Epilepsy, Anorexia nervosa andbulimia.	GC	September
	INTERNAL SCRIPTS WILL BE CHEKED BY: SS AND MS		
	FNTACOR11P: CLINICAL NUTRITION ANDDIET FOR SPECIAL SITUATIONS IN LIFE(PRACTICAL) TOTAL HOURS: 60 2 CREDITS Planning and preparation of Diets for the following diseases:i)Pepticulcerii)Viralhepatitisiii)Feveriv)Acute and chronic renal failure **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY : BG AND GC**	MSINHA BG	September-November
	FNTACOR12T: FOOD MICROBIOLOGY AND IMMUNOLOGY(THEORY)		
	1.GeneralIntroductiontomicrobes(Bacteria,Fungus,andAlgae) Classification, Nomenclature and Morphology (external and internal features). Principles of staining.	SS	September
	2. Growth kineticsofbacteria Growth kinetics, Factors affecting growth, different nutritional media for growth, methods of media sterilization.	DP	September
	3. Microbiology of food Microbes commonly present in food and the diseases caused by them, microflora present in milk, cereals, vegetables, flesh food. Seafood and Shell fish poisoning. Mycotoxins, Foodborne Diseases, Prions.	DP	October
	4.Microbial Food Spoilage Sources of Microorganisms infoods, Someimportantfoodspoilagemicroorganisms,Spoilageofspecific food groups - Milk and dairy products, Meat, poultryand	SS	October

	seafoods, Cereal and cereal products, Fruits and vegetables and Canned products. **5.FoodFermentations Fermentation –definition and types, Microorganisms used in food fermentations, Dairy Fermentations starter cultures and their types , concept of probiotics, Fermentated Foods-types, methods of manufacture for vinegar, sauerkraut, tempeh, miso , soya sauce, beer, wine and traditional Indian foods.**	SS	November
	6.Immunesystem Cells & Organs of the immune system, Innate and Acquired, Primary and secondary immune response, Active and Passive, Antigen, Antibody, Haptens, Adjuvants, Immunoglobulin- classification, polyclonal and monoclonal, basic structure and function, antigen and antibody reactions- RIA, ELISA, Immunoblot. Antibody production -processing and presentation of antigen, MHC, Humoral immune response. Cell mediated immunity, Formation, maturation and activation of B and T cells, Immune effectors system- cytokines complement system, K cells and NK cells, Cell mediated effectors response, Interferons, Immunopathology - basic principles of auto immune disease , Vaccine, toxins, toxoids, antiserum. Basic principles of immunological detection of pregnancy and immunohistochemistry. **INTERNAL SCRIPTS WILL BE CHEKED BY: DP**	DP	November
	FNTACOR12P: FOOD MICROBIOLOGY AND IMMUNOLOGY (PRACTICAL) TOTAL HOURS: 60 4 CREDITS 1. Introduction to microbiology: Use of equipments Understanding and use of compound microscope Use of Autoclave Use of Incubator and Inoculation chamber 2. Preparation of different types of media (complex, differential and selective) 3. Preparation of slant, stab and plates using nutrient agar 4. Morphological study of bacteria and fungi using permanent slides 5. Gram staining 6. Bacteriological Analysis of Water by MPN method 7. Ouchterlony double diffusion test in agar-gel. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY : DP**	DEBOSMITA PATHAK	September-December
5th Semester DSE FOR	**FNTADSE02T: ENTREPRENEURSHIP IN FOOD INDUSTRY (THEORY)** **1.EntrepreneurialDevelopmentCASESTUDIESofSUCCESSFULentrepreneURS,**		

FNTA HONS	EXERCISES on WAYS of SENSING opportunities – sources of idea, creating efforts, SWOT 49 Analysis, Entrepreneurial Skill assessment test,	GC , RED P0RTI ON PS COM MERC E	September-December

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	TechniquesofdevelopmentofentrepreneurialskIlls,positives elfimageandlocusofcontrol.		
	2.FoodBusinessmanagementCasestudiesofFoodProcessin gBusinessanditsaspects,Businessopportunityidentificatio nandAssessment techniques,BusinessIdeaGenerationandevaluationexercise ,Market AssessmentstudyAnalysisofcompetitivesituation,	GC	Septembe r-December
	SWOTAnalysisforbusinessandforcompetitors,Preparationof business plan,Preparationofprojectreport,MethodsofArrangementofin puts– financeandmaterial,Taxplanning.	MS	Do
	3.Personalitydevelopmentandcommunicationskillsno.ofHo urs20 CommunicationskillsandPersonalityDevelopment,Intrapers onal communicationandBodyLanguage,InterpersonalCommunic ationand Relationships,LeadershipSkills,TeamBuildingandpublicspe aking, CorporateGrooming,DressingEtique†e,PreparingforIntervie w, EmotionalQuotient. **INTERNAL SCRIPTS WILL BE CHEKED BY: GC AND MS**	MS	Do
	FNTADSE02P: ENTREPRENEURSHIP IN FOOD INDUSTRY(PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 1. Preparation of business plan. 2. Preparation of project report. 3. Tax Planning under the head Salary. 4. Visit to a food industry **INTERNAL PRACTICAL MARKS :- POULAMI SINHA COMMERCE**	PS COMMERCE	September-December
	FNTADSE03T: FOOD BORNE DISEASES AND FOOD TOXICOLOGY(THEORY)		

	1. Food borne DISEASES Definition related to food borne DISEASES, types of DISEASES with example (Pandemic, Endemic and Epidemic). Infection, contamination, decontamination, DISINFection, transmission (direct and indirect). Brief idea about different vector borne DISEASES, mode of TRANSMISSION prevention and control of following DISEASES: Salmonella, Shigella,Typhoid,Botulism,Cholera,E.colifoodpoisoning,Staphylococcal food POISONing, Clostridium infection, Bacillaryinfection.	DP	September
	2. Lactose intolerance Lactose intolerance-ITS mechanism and enzyme deficiency.	DP	October
	3. MechanismoffoodborneDISEASESMolecularmechanismof foodborne DISEASES.	DP	November
	4. Food SAFety Definition: Food SAFety, TYPES of hazards (Biological, chemical and PHYSICal hazARDS), impact on health, control measures, factors affecting foodSAFety.	BG	September-November
	5. HygieneandSAnitationHygieneandSANitation:Contamination,control methODSUsing phYSICAl and chemical agents, USE of preservatives, pest control management, personalhygiene.	GC	September-November
	6. FoodsafetymanagementFoodsafetymanagement:ConceptofSAFety management,prerequISITES-GHPs,GMP,HACCPetc.	BG	December

	7.ToxicagentsinfoodToxicagentsinfood:Botulism,lathyrism, Ciguatoxins,Tetrodotoxins,Saxotoxins,conotoxins,Antivitamins, Haemagglutins,Cyanogenicglycosides,Strychnine,Solanine,atropine, Muscarine. **INTERNAL SCRIPTS WILL BE CHEKED BY: DP**	GC	September - November
	FNTADSE03P:FOODBORNEDISEASESANDFOODTOXICOLOGY(PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 1. Assessment of surface sanitation by swab and rinse method. 2. Assessment of personal hygiene. 3. Designing of various food processing systems and food service areas. 4. Design and layout of cold storage and ware house. 5. Assessment of physico chemical properties of waste water. 6. Isolation and enumeration of bacteria from rottenfoodbreadandvegetables.7.Testingofsanitizersanddisinfectants. 8. Study of phenol coefficient of sanitizers. 9. Visit to Food industry and preparation of report. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :- DP**	DP	September-December
	5TH SEM G (DSE 1 SYLLABUS FOR FNTG [ONLY FOR DSC]) FNTGDSE02T- FOOD SAFETY AND FOOD PROCESSING **1.Foodadditiveandfoodsafety:Conceptoffoodsafety,factorsaffecting foodsafety,Foodadditives-variousTypesandtheireffectsonhealth.**	BG	September
	2.FoodspoilageCereals,Pulses,Vegetables&Fruits,Milk&milk products,Fleshyfoods,Fats&oils.Foodborneinfections&infestation.	BG	October
	3.FoodadulterantsPFAdefinitionoffoodadulteration,Common adulterantsinfoodandtheireffectsonhealth,CommonhouseHold methodstodetectadulterantsinfood.	M.SINHA	September
	4.FoodlawsandregulatoryauthorityNo.ofHours10PreventionofFood Adulteration(PFA)Act,Regulatingauthority-CodexAlimentarius,ISI, Agmark,FruitProductsOrder(FPO),MeatProductsOrder(MPO),Bureau ofIndianStandards(BIS),MMPO,FSSAI.	SS:	September
	5.FoodPreservationNo.ofHours10FoodPreservation–Definition, Objectives,Methods–mainprinciple,procedure,commonexamples.16	M.SINHA	October
	6.Foodadjunctsandpreservedproducts No.ofHours8Spices(Chilies, Turmeric,GarlicandGinger),useandnutritionalaspect.Jams,Jellies, Squashes–usesandnutritionalaspects. **INTERNAL SCRIPTS WILL BE CHEKED BY: BG**	SS	October

	FNTGDSE02P- FOOD SAFETY AND FOOD PROCESSING(PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 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)	GC	September

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	Artificially foreign matter in tea (dust/leaves). 2. Prepa ration of Jam, Jelly, Pickle and Sauce **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :- GC**		
1ST SEMESTER	CORE COURSE (CC) FNTACOR01T: HUMAN NUTRITION (THEORY) TOTAL HOURS: 60 4 CREDITS 1.IntroductiontoFoodandNutritionNo.ofHours10Foods:Energygiving, bodybuildingandprotective.Nutrients:macroandmicronutrients,Dietand balanceddiet,Menu.Healthandnutritionalstatus.Malnutrition,functional food, prebiotics, probiotics, 8 phytochemicals, nutraceuticals. Fibre. Functions of foods: physiological, psychological, social. Food groups,food pyramid,Relationbetweenfoodandnutrition,healthanddiseases.	GC	September-November
	2. Foods, Nutrients and cooking of food No. of Hours 10 Foods and their nutrientcontents:Nutrientspresentincerealsandmillets,pulses,nut sand oil seeds, fruits and vegetables, milk and milk products, flesh food, eggs, Condiment and spices, salt. Nonnutrient components of foods: phytate, tannins,oxalate,trypsininhibitor,goitrogensandothertoxicagentsin food. Cooking: Beneficial and adverse effects of cooking. Different methods of cooking-dry, moist, frying, and micro wave cooking- advantage, disadvantageandtheeffectofvariousmethodsofcookingonfoods,Solar cooking.	BG	September-November
	3.FoodenergyandenergyrequirementsNo.ofHours15Theenergy value of foods: Physical and physiological calories. Bomb calorimeter Energy requirement of an individual: Basal metabolic rate (BMR) and physical activity..BMR:Measurement(directandindirect),factorsaffectingBMR, SDAoffoods.physicalactivityratio(PAR).Classificationofactivities based on occupations.Nutritional requirements and Recommended dietary allowances(RDA):factorsaffectingRDA,ApplicationofRDA,Referenceman andwoman..	MS	September-November

	4.DigestionofFoodsNo.ofHours25Componentsofgastrointestinaltract. Structure of different segments of GI tract. Digestive glands: structure of salivary glands, gastric glands and intestinal glands. Structure of pancreas andliver.,Digestivesecretions:salivaryjuice,gastricjuice,pancreaticjuices and intestinal juices. Bile and bile secretion. Digestion and absorptions of carbohydrate, protein,lipid, fat soluble vitamins, water soluble vitamins(thiamine, riboflavin, niacin, pyridoxine, folate, vit B12, vit C), minerals (Ca, Fe, I, F, Cu, Zn) **INTERNAL SCRIPTS WILL BE CHEKED BY: SS**	SS Ritwick Acharjee	September-October November

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	FNTACOR01P: HUMAN NUTRITION (PRACTICAL) TOTAL HOURS: 60 2 CREDITS 1. Process involved in cooking, microwave, steaming, grilling, deep fat frying.	GC	September
	2.Generalconceptsofweightsandmeasures,Eyeestimationofrawcooked foods	BG	September
	3. Preparation of food from different food groups and their significance in relation to health	GC	October
	4. Preparation of supplementary food from different age group and their nutritional significance	BG	September
	5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child	BG	October-November
	INTERNAL PRACTICAL MARKS :- BG AND GC		
	FNTACOR02T: PHYSIOLOGY IN NUTRITION (THEORY) TOTAL HOURS: 60 4 CREDITS 1.Unit of Life: Cell and Tissue Structure No. of Hours 12 Differencebetweenprokaryoticandeukaryoticcells&plantandanimalcells, Structure and basic functions of animal cell organelles, Structure and functions of plasma membrane, Role of membrane in transport and communications, Importance of cell junction- tight, gap and desmosome, Types of human tissue- location, structure and functions. Structure of muscles, bones, teeth andjoints.	SS+RITWICK ACHARYEE	September-October
	2.Blood and body fluids No.ofHours12 Blood and its composition, Morphology, formation and functions of formed elements, Blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Mechanism of blood coagulation, Haemoglobin-structure and function.Extracellular fluid, lymph.	MS	September-October
	3.CardiovascularsystemNo.ofHours12Structureofheart,artery,veinand capillary, Properties of cardiac muscle, Cardiac cycle, cardiac output, heart rate, heart sounds, ECG- normal and abnormal. Systemic and pulmonary circulation.Bloodpressure,pulsepressureRadialpulse,coronarycirculation	BG	September-December
	4. Respiratory system No. of Hours 12 Structure of lungs: alveoli and airways. Respiratory volumes and capacities,Mechanics of breathing. Oxygen and carbon dioxide transport, Neural and chemical control of breathing.	MSETH	September-November

	5. Renal Physiology, skin and body temperature No. of Hours 12 Anatomy of renal system: kidney, ureter, urethra and urinary bladder, Nephron: structure, Juxtaglomeralarapparatus GFR and GFI, Tubular functions, Urine formation: Counter current exchanger and multiplier. Role of kidneyin	GC AN D M SE TH	Septemb er- Decemb er

	water and electrolyte balance. pHregulation by kidney. Structure of skin. Sweatandsweatglands.Sebum.Corebodytemperature,heatlossandheat gain, Regulation of bodytemperature. **INTERNAL SCRIPTS WILL BE CHEKED BY: SS, BG.GCMS** FNTACOR02P:PHYSIOLOGYINNUTRITION(PRACTICAL)TOTALHOURS:602 CREDITS 1. Determination of pulse rate in Resting condition and aGer exercise (30 beats/10 beats method) 2. Determinationofbloodpressurebysphygmomanometer(Auscultatory method). 3. InterpretetationognormalECGcurvewith6chestleads. 4. MeasumementofPeakExpiratoryflowrate.(Byspirometer) 5. DeterminationofBleedingTime(BT)andClottingTime(CT). 6. Detection of Blood group (Slidemethod). 7. HAEMOGLOBINESTIMATION **INTERNAL SCRIPTS WILL BE CHEKED BY: SS AND MS** FNTGCOR01T:FOODANDNUTRITION(THEORY)TOTALHOURS:60CREDITS: 4 1. Introduction to Food and Nutrition No. of Hours 4 Definition of Food, Nutrition,Nutrient,Nutritionalstatus, Dietetics,Balancediet,Malnutrition, Energy (Unit of energy – Joule,Kilocalorie).	MS MS MSET H MSET H SS SS M SETH BG BG	September September October November January September October-January

	2. FoodandNutrientsNo.ofHours8Carbohydrate,Protein,Fat,Vitamins and Minerals (calcium, phosphorus, sodium, potassium, iron, iodine, fluorine)-sources,classification,functions,deficiencesofthesenutrients. Functions of water and dietaryfibre.	GC	September-November
	3. FivefoodgroupsNo.ofHours10Basic5foodgroups:Types,composition, nutritional significance, role of cookery of cereals, pulses, milk & milk products,meat,fish,egg,vegetables &fruits,nuts,oil&sugar.	GC	December-January
	4. FoodChemistryNo.ofHours10Chemistryofcarbohydrate,proteinsand fats. Vitamins andminerals	GC	December-January
	5. Nutrients Metabolism No. of Hours 15 Elementary idea of metabolism, enzymesandhormones-nameandtheirimportantfunctions.Metabolism inbrief(Glycolysis,Glycogenesis,Gluconeogenesis,Cori'scycle,Kreb'scycle, Deamination, Transamination. Role of hormones in carbohydrate metabolism.		

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	6.BasicMetabolismRate(B.M.R)No.ofHours6B.M.R:Definition ,factors affecting B.M.R. and Total Energy Requirement (Calculation of energy of individuals).8	BG	December
	7. Deficiency diseases No. of Hours 7 Deficiency diseases (Nutritional anaemia, PEM, IDD, VAD)- Aetiology, Prevalence, Clinical findings, Prevention & Treatment. **INTERNAL SCRIPTS WILL BE CHEKED BY: BG AND GC**	BG & GC	January
	FNTGCOR01P: FOOD AND NUTRITION (PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 1. Elementary idea of weights & measures.	SS	September
	2. Preparation of cereals, pulses, vegetable, egg, milk, fish, nuts dishes.	SS	October
	3. Planning and preparation of diet of an adult male/female.	MS	November
	4. Planning of a day's diet for pregnant & lactating mother.	MS	December
	5. Preparations of supplementary foods for infants.	SS	January
	INTERNAL PRACTICAL :- SS **NOTE:-** **ALLTHESYLLABUSMUSTBECOMPLETEDTENTETIVELY WITHIN:- FEBRUARY2021**		

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Semester/ Year	Syllabus Module/ Unit	No of Lectures	Teachers	distribution
2nd Semester	**FNTACOR03T: FOOD CHEMISTRY(THEORY)**	**5**	BG	WITHIN MAY
	1. proteins & amino acids	1		
	Proteins: Classification. FUNC,deficiency	1		
	Protein structure and organization: primary, secondary, tertiary and quaternary structure.	1		
	Amino acid classification.	1		
	Physical and chemical properties of amino acid and protein.	1		
	Biological value of proteins (BV), Net protein utilization (NPU) and Proteinefficiency ratio (PER).	1		
	2.carbohydrate chemistry	**6**	BG	JUNE
	Carbohydrates: classification- mono-, di- & polysaccharides; func, deficincy	1		
	Stereoisomerism in carbohydrates.	1		
	Physical and chemical properties of mono-, di- and polysaccharides;	1		
	Dietary fibre - definition;	1		
	Fibre components - cellulose, hemicellulose, pectin substances, lignin.	1		
	3, Lipid chemistry	**5**	SS	WITHIN MAY
	Lipids: Classification- Fatty acids, triglycerides, phospholipids, Glycolipids, sterols and steroids. Eiconoids.	1		
	Edible fats and oils - physical and chemical properties, Hydrogenation and importance of fats in the diet.	1		
	Physical and chemical properties of saturated, monounsaturated, polyunsaturated fatly acids, trans fatty acids, phospholipids, cholesterols and liposomes.	1		
	Essential fatty acids.	1		
	4. water	**3**	BG	WITHIN JULY
	Definition of water in foods, water activity, phase transition of food containing water.	1		
	Water activity and its influence on quality and stability of foods, methods for stabilization of food systems by control of water activity	1		
		1		

	5. physiochemical principles Laws of thermodynamics, Enthalpy, Entropy. Gibbs' free energy Thermodynamics and living system. Definition, explanation, importance and biological application of diffusion, osmosis, absorbtion, absorption, viscOsity and surface tension. Colloids: definition and importance. Acids and bases, Hydrogen ion concentration. Buffers. Oxidation reduction potential of bioactives (e.g. flavonoids, phenolic acids, quinols) and their applications in food systems **6. enzymes** Enzmes: Definition and structure. Enzyme substrate interaction. Enzyme kinetics, MichaelisMenten constant(Km).equation Enzyme inhibition. Factors regulating enzyme activities, Isoenzymes, Pro- enzymes, Ribozymes, Abzymes, Concept of Rate limiting enzymes **INTERNAL EXAMINER :=SS** **FNTACOR03P:** **FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(PRACTICAL)** 1. Qualitative tests for the identification of: Glucose, Galactose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2. Glucose estimation in blood . 3. Qualitative tests for the identification of - Albumin, Gelatin, Peptone, urea, uric acid. 4. Protein estimation by Biuret and Lowry methods. 5. Estimation of urea and uric acid in blood. 6. Determination of acid value of oils by titrimetric method.	**6** 1 2 1 1 1 **4** 1 2 1 1 4 2 2 2 2 2 2	SS SS DP	JUNE JULY ‘=- MAY-JULY

	7. Determination of osmotic pressure of colloidal solutions.			

	8. Determination of specific gravity of liquid (fruit juice, blood).	2		
	INTERNAL EXAMINER :- DP **FNTACOR04T: PHYSIOLOGY IN NUTRITION (THEORY)**	**10**		
	1. physiology of excitable cells Different types of muscles and their structures	1		
	Mechanism of skeletal muscle contraction and relaxation,	2	M. SETH	MAY-JUNE 2ND WEEK
	Muscle energetic, Isometric and isotonic muscle contraction.	2		
	Structure of nerves.	1		
	Nerve impulse and its conduction. Synapse and Neuromuscular junctions.	2		
	Synaptic transmission.	1		
	Neutrotrophins	1		
	2. nervous system	**10**		
	Brief anatomy of Brain and spinal cord. Central and Peripheral nervous system.	**1**		
	Reflex action and Reflex arc.	1	M.SETH	JUNE 2ND WEEK-JULY END
	Outline of functions of cerebrum, cerebellum, hypothalamus. Autonomic nervous system:	1		
	Sympathetic and parasympathetic nervous system.	1		
	Sensory physiology: Sensory Receptors as biotransducers.	1		
	Brief outline of the special senses.	1		
	Structure and functions of photoreceptors in eye and hair cells in cochlea	3		
	3. reproductive system			
	Structure of ovary, fallopian tubule and uterus.	12		
	Oogenesis and ovulation.	1	MS	JUNE
	Changes during menstrual cycle,	2		

	Hormonal regulation of menstrual cycle and menopause Fertilisation and implantation of blastocysts , Placenta. Hormonal control of pregnancy, parturition, lactation, Structure of testis, prostrate and seminal vesicle. spermatogenesis and its hormonal regulation. 4.**endocrine system** Structure, hormones and functions of pituitary, thyroid, parathyroid, adrenal gland and pancreas. Hypothalamus as an endocrine gland. Gastrointestinal hormones. Growth factors. INTERNAL EXAMINER :- GC **FNTACOR04P: PHYSIOLOGY IN NUTRITION(PRACTICAL)** 1. Test for Visual acuity, Colour vision. 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 in blood or urine. 4. Total count (TC) and Differential count (DC) INTERNAL EXAMINER	2 2 2 1 2 **12** 2 2 2 2 2 2 4 4 2 4	GC M.SETH	WITHIN JUNE WITHIN JUNE

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		M.SETH		
4th Semester	**FNTACOR08T: community nutrition(THEORY)** **1.Concept on Community** Concept of Community, types of Community, Factors affecting health of the Community. **2.Nutritional Assessment and Surveillance** Nutritional Assessment Surveillance: Meaning, need, objectives and importance. **3. Assessment methods for human** Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods. **4. Diet survey** 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** Clinical Signs: Need and importance, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs. Nutritional anaemia. Rickets, B-Complex deficiencies. **6. Nutritional anthropometry** Nutritional anthropometry:Need and importance,	**2** **4** 2 2 **5** **1** **2** 1 1 **10** 3 4 3 **10** 1 2 2 2 2 1	SS SS MS SS MS	May 2nd week June 1st week JUNE 1ST WEEK WITHIN JUNE JULY 1ST WEEK

	standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements. Growth & Development; Body Composition: Changes through lifecycle Use of growth charts. 7. **Agencies and programmes** International, national, regional agencies and organisations. National nutritional intervention programmes to combat malnutrition:ICDS, Midday meal, Special nutrition program, National programs for prevention of anaemia, Vitamin A deficiency control programme Iodine deficiency disorders. INTERNAL EXAMINER :- MS **FNTACOR08P: COMMUNITY NUTRITION (PRACTICAL)** 1. Anthropometric Measurement of infant - Height, 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, Z scores, body Mass Index (BMI) Waist - Hip Ratio (WHR). 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 INTERNAL EXAMINER : BG	**4** **10** 4 3 3	MS MS SS SS SS BG	MID JULY JULY END WITHIN JULY

	FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	**4**		
	1. Introduction on Health Health and its importance: Definition of health (WHO), Dimension of health,	1	GC	2ND WEEK OF MAY
	Positive health.	1		
	Determinants of	1		
	health.	1		
	Concept of disease and its causations.	2		
	2. Data of Community health Secondary sources of community health data: Indicators of health. Secondary sources of data from NFHS, Vital Statistics, Census of India, ICMR.	**10**	GC GC	MAY END JUNE END
	3. Epidemiology		GC	
	Definition of epidemiology,		GC	
	components and aims of		GC	
	epidemiology, basic measurements		GC	
	in epidemiology. Demography and			
	family planning.		MS	
	Brief idea about epidemics,		MS	
	epidemiological methods: analytical epidemiology (case control and cohort study);		GC	
	Experimental epidemiology.	**12**	GC	
	Infectious diseases in			
	epidemiology. Dynamics of			

	disease transmission, modes of transmission of disease.			

	4.Diseases: Prevention and control Epidemiology of diseases, prevention and control [(Nutritionally related disease:- Hyperlipidaemia, clotting disorder, scurvy, beriberi , goiter); (vector borne disease: - HIV/AIDS, malaria, poliomyelitis, dengue, tuberculosis, mumps measles rubella, chicken pox, pertussis, chikungunya); **(food borne disease:- salmonellosis, shigellosis,** **Typhoid , botulism, amoebiasis, rotavirus, E.coli food poisoning, staphylococcal food poisoning);** (water borne disease: arsenic toxicity, cholera); (non communicable disease:- obesity, diabetes, coronary heart disease) **5.Public health** Definition of public health,	3	GC SS MS BG MS	WITHIN JULY 4TH week MAY

	relation between health and nutrition**.**			

	6. Immunization Immunization : definition. Host defenses and immunity, immunizing agents: its types, national immunization schedule- its importance, immunization in adults and travellers, hazards of immunization health advice to foreign travellers.	**2**	SS	MAY
	7. Community health care Health care of the community, health care delivery, health care system, Primary health care in India, Indian public health standards for subcenters, PHCs, community health centers. Hospital waste management**.**	**2**	MS	JUNE 1ST WEEK
	8. Community water management Community water management: importance of water to the community, sources of water. Concept of water pollution. Purification of water in small and large **scale.** Drinking water handling and safe drinking water	6 2 2 2	SS	WITHIN JUNE
	9. Community waste management Community waste management: types and methods of disposal of wastes, sewage disposal and treatment**.**	**4**	BG	MAY
	10. Air pollution Air pollution: source of air pollution, factors of air pollution. Indoor air pollution. Monitoring of air pollution. Effects, prevention and control of air pollution. **INTERNAL EXAMINER GC** **FNTACOR09P: EPIDEMIOLOGY AND**	**4**	BG	JUNE

	PUBLIC HEALTH(PRACTICAL))			

	.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.) **FNTACOR10T: DIET THERAPY FOR LIFE STYLE DISORDERS(THEORY)**		GC	WITHIN JULY
	1. Lifestyle disorder Introduction, types, aetiology, management.	**4**	BG	MAY 2ND WEEK
	2. Diabetes Mellitus Definition, Etiology, Classification, long and short term complications, Diagnosis, Management (Insulin Therapy, Dietary Management with food exchange list, Exercise,Pharmacological), Role of artificial sweeteners. Overview of special conditions: Diabetes in Childhood, Pregnancy, Role of Nutrition Education, Role of Nutrition in Prevention.	8	BG	MID JUNE
	3. Cardiovascular diseases Prevalence, incidence, mortality with special reference to Indian situation. Patho - physiology and Management of Atherosclerosis, Endothelial dysfunction, Thrombosis, Angina Pectoris, Congestive cardiac failure, stroke, MI. Hyper-lipidemia– classification, diagnosis and nutritional management,	**8**	GC	WITHIN MAY

	Hypertension: Oetiology, Risk factors, Patho-physiology, Management **4. Weight management** Obesity and Overweight: Body weight components, Classification of obesity,(gynoid/android and Regulation hypertrophy/hypersplasia, Etiology and assessment of obesity and prevalence in Indian situation, Complications of obesity. Management: Medical (Pharmacological), Nutrition and lifestyle, Surgical, Behavioural Juvenile Obesity. Underweight: Etiology , Diet management, Eating disorders: (Anorexia Nervosa and Bulimia), Management (Medical,Nutritional care), Psychological support and Prevention. **5. Nutritional management of metabolic disease**: Gout : Role of proteins and purine, Etiology, Symptoms and complications, Dietary management,Inborn errors of metabolism: PKU, MSUD, Glycogen storage disorders, Galactosemia **6. Nutrition and respiratory health** Physiology and functions of the respiratory system, Nutritional management of Asthma **7. Nutritional management in cancer (Oral and colon)** Cancer: Pathogenesis and progression of cancer, Role of Nutrients and food additives in cancer therapies and their nutritional implications, Symptoms, Diagnosis, Cancer therapies: Nutritional implications, Dietary management **8. Arthritis and Osteoporosis** Etiology dietary treatment in arthritis and osteoporosis.	**8** **6** **4** **4** **2**	BG GC BG GC GC	WITHIN MID JULY WITHIN JUNE WITHIN JULY WITHIN JULY

	INTERNAL EXAMINER :- BG **FNTACOR10P: DIET THERAPY FOR LIFE STYLE DISORDERS(PRACTICAL)** Planning and preparation of Diets for the following diseases: i) Obesity and Underweight SS ii) Diabetes mellitus SS iii) Hypertension and Atherosclerosis MS iv) Overweight and Underweight SS v) Gout MS vi) Osteoporosis MS INTERNAL EXAMINER :- SS **FNTGCOR02T: HUMAN BODY AND NUTRITION (THEORY)**		SS , MS	WITHIN JULY
2ND SEM GENERAL	**1. Animal cell** Animal cell: definition, structure and functions of different parts. Organelle	**4**	BG	2ND week of MAY
	Blood and body Fluids: Blood, composition, blood corpuscles, functions, blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Rh factor, blood coagulation. Lymph: Composition and function.	**4**	GC	2ND WEEK OF MAY
	Cardiovascular and Respiratory system Heart: Junctionl tissues and functions. Cardiac cycle, cardiac output, blood pressure and its regulation. Mechanism of respiration, Respiratory centre. Respiratory regulation.	**6**	BG M.SETH	2ND week of JUNE
	4. Digestive system and Digestion Digestive system: Structures involved in digestive system (mouth, oesophagus, stomach, small intestine, large intestine,liver pancreas, gallbladder), and their functions, composition of different digestive juices & their functions.	**4**	GC	WITHIN JUNE

	Digestion and absorption of carbohydrate, protein and fat. **5. Excitable cells** Brief description about the mechanism of muscular contraction. Neuro-muscular transmission. **6. Regulatory systems** General idea about the Hormones in human body and their significance on nutrition. Brief idea about brain and sinal cord. somatic and autonomic control of body INTERNAL EXAMINER :-GC **FNTGCOR02P: HUMAN BODY AND NUTRITION (PRACTICAL)** 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. Identification of permanent sections (Blood cells, Stomach, Small intestine, large intestine, Liver, pancreas). 4. Determination of Bleeding Time (BT) and Clotting Time (CT). 5. Detection of Blood group (Slide method). FNTGCOR04T:DIETETICS (THEORY) TOTAL HOURS: 60 CREDITS: 4 **1. Concept on Diet therapy** Definition and objective of dietetics, Definition-diet therapy, Dieticians;principles and classification of the therapeutic diet. Responsibility of dieticians. **2. RDA, Meal planning and Dietary guidelines** RDA- Definition, Nutritional requirements (RDA), **BG** Principles and objectives of meal planning, **BG**	**8** **4** **8** **4** **6**	BG M.SETH GC SS BG SS	WITHIN JULY WITHIN JULY WITHIN JULY WITHIN MAY 2ND WEEK WITHIN MAY 3RD WEEK

4TH SEM GENERAL	Dietary guidelines of pregnant & lactating women, BG infants(Weaning, supplementary food), DP pre-school children & school children BG (School lunch programme), DP adult males and females, DP old age people. BG 3. **Hospital diet** Hospital diet: regular, soft, fluid, s pecial feeding methods- advantages, disadvantages **4. Dietary management of different diseases** **Dietary management in Gastro intestinal diseases (diarrhoea,** **constipation,** **gastritis,** **peptic ulcer &** **flatulence),** **Fever (short term),** **Diabetes mellitus (Type II - NIDDM),** Heart diseases (hypertension, a therosclerosis, hyperlipidaemia), Liver diseases (infective hepatitis, cirrhosis of liver), Gout, Obesity (including assessment indices), Underweight. **5. Food Allergy** Food allergy- Definition, sources, symptoms, diagnosis, treatment, food intolerance. **INTERNAL EXAMINER:- MS**	**4** **8** **4**	BG BG SS BG	WITHIN JUNE 1ST WEEK WITHIN JULY 2ND WEEK WITHIN JULY WITHIN JULY

	FNTGCOR04P:DIETETICS(PRACTICAL) **TOTAL HOURS: 60** **CREDITS: 2** 1. Planning and Preparation of fluid diet, soft and solid diet. MS 2. Planning & preparation of a day's diet for the following conditions: Peptic ulcer GC Fever, GC Hypertension, GC Diabetes mellitus (Type II NIDDM), MS Hepatitis, MS Obesity. MS **SEC 2** 1. Introduction to clinical nutrition, clinical conditions requiring dietary intervention, role of dietitian in hospitals/clinics, GC staff training, RD –requirements, procedure, functioning. DP 2. Practical 1. Visit to an ongoing program in ICDS: one rural, one urban. (eg. mahilamandal meeting or nutrition week celebration . 2. Visit to a health centre (ANC clinic run by Government health department and observe quality of counseling imparted to pregnant women (especially awareness of anemia, importance of IFA). 3. To visit an NGO either rural or urban and observe one intervention program implemented for 59 women, school children or adolescence (For all the above observation appropriate observation check lists will be made and used) 4. Visit to old age home/Nutrition Rehabilitation Centre/slum area and prepare report on nutritional		GC MS GC GC	Within JULY WITHIN JULY Within JULY

	status /health concern(at least 10 case studies to be done) 5. Internship in any hospital/nursing home -case study of diseases 6. Preparation of visual aids indicating clinical problems related to nutrition – Charts, posters, models etc. and demonstration INTERNAL EXAMINER GC SEMESTER 6 (HONOURS) **FNTACOR13T: FOOD PROCESSING AND FOOD TECHNOLOGY(THEORY)** **1 Food Storage and 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. Classification of food based on pH, Food infection, food intoxication, definition of shelf life, perishable foods, semi perishable foods, shelf stable foods, Storage 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, spices and canned foods. **2 Food preservation** Definition, objectives and principles of food preservation. Different methods of food preservation. **:** Freezing and Refrigeration:Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food. Thermal Processing-Commercial heat preservation methods: Sterilization, commercial sterilization, Pasteurization, and blanching. Drying and Dehydration - Definition, drying as a means of		DP MS	MAY MAY

	preservation, differences between sun			

	drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names of types of driers used in the food industry. Evaporation – Definition, factors affecting evaporation, names ofevaporators used in food industry. Units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization. 3. **Preserved Products** Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups types, composition and manufacture, selection, cost, storage, uses and nutritional aspects **4. Food Standards and Food Laws** Introduction on Food standards and Food Laws, FSSAI, ISI, Agmark, FPO, MPO, PFA, HACCP, Codex Aulimentaurius. 5. **Food Adulteration** Definition, Classification, Different types of adulterants **6.Food Packaging** Packaging Functions and Requirements,, Printing of packages .Barcodes & other marking, Labeling Laws INTERNAL EXAMINER :-DP MS **FNTACOR13P: FOOD PROCESSING AND FOOD TECHNOLOGY(PRACTICAL) TOTAL HOURS: 60 2 CREDITS** 1. Study on Blanching and Browning Process. 2. Preparation of Fruit preserves(Jam, Jelly). 3. Preparation of vegetable preserves.(Pickles) 24 4. Dehydrated Products – tray drying, sun drying etc. 5. Tomato Processing. 6. Fruit Pulping/Juice/Beverages production. 7. Preparation and Standardisation of Traditional Indian Fermented Food. 8. Visit to Food Processing and Preservation unit.		DP MS DP MS ENTIRELY BY SS	JUNE JUNE JULY JULY WITHIN JULY

	9. Detection of Adulterants in common Food Stuffs like Milk, Oil, Laddu, Turmeric etc. INTERNAL EXAMINER :- SS			
	FNTACOR14T: RESEARCH METHODOLOGY AND BIOSTATISTICS(THEORY) **1. Research Methodology** Meaning, objectives and Significance of research. Types of research, research approaches and scientific methods, Research process, Criteria of good research.	6	DEBASHIS MAZUMDAR	WITHIN MAY
	2. Research problem Definition and identification of a research problem, Selection of research problem. Technique Involved in Defining a Problem.	6	DEBASHIS MAZUMDAR	WITHIN JUNE
	3. Study design Meaning and needs of design, important concepts relating to research design, variables, experimental and control groups. (Use examples from epidemiology and clinical trials). Different research designs- exploratory, descriptive, analytical and diagnostic (epidemiology and clinical trials). Pilot studies. Qualitative vs quantitative research**.**	12	EXTENSION LECTURE	WITHIN JULY
	4. Sampling of data and analysis Variable, parameter, statistics. Frequency distribution. Cumulative frequency. Graphical presentation techniques including Histogram, Bar chart, Pie chart along with the concepts of frequency polygon. Mean, median, mode, Standard Deviation and Standard Error of mean .Probability. Normal distribution. Student's t-distribution.Testing of hypothesis - Null hypothesis, errors of inference, levels of significance, Degrees of freedom.	12	DR SONALI MUKHERJEE ECONOMICS DEPT	WITHIN JULY
	5. Preparation of report a. Graphical and diagrammatic			

	presentation. b. Interpretation of – Meaning of			

	interpretation, Technique of interpretation, c. Precaution in interpretation- Interpretation of tables and figures. d. Report writing – Significance of report writing, Steps in writing report, Types of reports. **INTERNAL EXAMINER :- DR SM AND DM**		DEBASHIS MAZUMDAR	WITHIN JULY
	FNTACOR14P: RESEARCH METHODOLOGY AND BIOSTATISTICS(PRACTICAL) 1. Assignment for calculation of mean, median, mode, standard deviation, standard error of mean and students' 't' test with provided data.		DR SONALI MUKHERJEE	WITHIN JULY
	FNTADSE05T: DAIRY TECHNOLOGY (THEORY) **1. Introduction** Status of dairy industry in India **2. Physical properties of milk** Color, taste, pH and buffering capacity, refractive index, viscosity, surface tension, freezing, boiling point, specific heat, OR, electrical conductivity. **3. Lactose** Lactose (alpha and beta forms and their differences) Significances of lactose in dairy industry. **4. Milk fat** Composition and structure, factors affecting melting point, boiling point, solubility and Refractive Index, fat constants (saponification value, iodine value, RM value, Polenske value, peroxide value). Chemical reactions of fat (hydrolysis, auto-oxidation), condition favouring auto-oxidation, prevention, measurement of auto-oxidation. **5. Protein and Enzymes** General structure, amphoteric nature, difference between casein and serum protein, different types of		ENTIRELY BY DP	WITHIN JULY

	casein (acid and rennet), uses of casein,			

	fractionation of protein. Enzymes- catalase, alkaline phosphatase, lipases and proteases. **6 .Market milk industry** Systems of collection of milk Reception, Platform testing Various stages of processing Filtration, Clarification, Homogenization, Pasteurization, Description and working of clarifier, cream separator, homogenizer and plate heat exchanger . **7. Milk products** Butter, ghee, flavored milk, yoghurt, dahi, shrikhand, ice-cream, condensed milk, milk powder, channa, paneer, cheese (cheddar). INTERNAL EXAMINER :- DP **FNTADSE05P: DAIRY TECHNOLOGY (PRACTICAL) CREDITS: 2** 1. To perform platform tests in milk.(Acidity,COB,MBRT,specificgravity,SNF). 2. To estimate milk protein by Folin method. 3. To estimate milk fat by Gerber method. 4. Preparation of flavoured milk/. Pasteurization of milk. 5. To prepare casein and calculate its yield. 6. **Visit to a milk industry**. **FNTADSE06T: NUTRITIONAL MANAGEMENT AND COUNSELLING (THEORY)** **1. Basics of diet counselling** Diet Counselling-meaning, significance, process, types Goals of counselling, individuals, group and family counselling, Basic sequence in counselling, Materials needed for counselling –models, charts, posters, AV aids, Hand outs etc, Communication process in counselling and linguistics in	8	DP MS MS	WITHIN JULY WITHIN JUNE

	clinical dietary practices,			

	problems in communication Role of Counsellor & Counselee, Techniques of obtaining relevant information- 24 Hour Dietary recall, List of food likes and dislikes, Lifestyle Dietician as a part of medical team and research team, Impact of counsellingon health and disease of individuals – discussion of hospital case studies 2.**Introduction on Psychology and counselling** Introduction to psychology – Definition , Nature and Scope Attention and perception – Types of attention and factors influencing attention , principles of perceptual organization and abnormalities in perception learning and memory- Types of learning, Types of memory, Forgetting and its causes motivation and emotion- Types of motives, types of emotions, emotional expression, Personality- nature and definition , factors influencing personality, Psychoanalytic theory of personality Nature and goals of counselling Principles of counselling, Characteristics of a good counsellor, Ethical principles of counselling, Special areas of counselling: Educational, family, health, community and counselling of alcoholic, and drug addicts. **3. Counselling Skills** Approaches to counselling – Psycho analytic approach, Behaviouristic, Humanistic approach, Pre – Helping phase: Rapport building skills, Attending and listening skills, Stage I skills: Empathy, respect, Genuineness and concreteness, Stage II skills: Advanced empathy, self disclosure, Immediacy and Confrontation. Stage III skills: Goal setting, Action plan Programme and Brainstorming **4. Diet Counselling at Hospital and Community Level** Role of counselling in hospital, Role of counselling in	10 10 10	PSYA DEPT EXTENSION LECTURE GC	WITHIN JUNE 2ND WEEK WITHIN JULY WITHIN JUNE

	community, Organizing health camps and patient feedback – at hospital level, Organizing health camps and patient feedback – at community level, Diet counselling for obese people, Diet counselling for Diabetics, Diet counselling for CVD, Diet counselling for			

	mother and child care, Diet counselling for adolescent, Patient follow up / home visits,geriatric counselling with specific diseases like HIV/AIDS. INTERNAL EXAMINER:- MS GC **FNTADSE06P: NUTRITIONAL MANAGEMENT AND COUNSELLING (PRACTICAL)** **CREDITS: 2** 1. Organizing health camps and patient feedback – both at hospital level and community level 2. Diet counselling for mother and child care,adolescent, obese people, Diabetic patient CVD. 3. Patient follow up / home visits INTERNAL EXAMINER :- BG **6TH SEM G** **FNTGDSE04T- NUTRITIONAL BIOCHEMISTRY(THEORY)** **1. Carbohydrate** Classes of carbohydrates, Properties and dietary importance of starch, sucrose, lactose, glucose and fructose. Metabolism: Glycolysis, Tricarboxylic acid (TCA) cycle, Gluconeogenesis, Glycogenesis, Glycogenolys **2. Protein** Classes, properties, functions and secondary structure of protein (alpha helix, beta pleated sheet). Concept and definition: Complete and incomplete proteins, Biological value, Protein Efficiency Ratio (PER), Net Protein Utilisation (NPU), Essential and non-essential amino acids, Deamination, Transamination and Urea cycle. **3. Lipid** Classes of lipids, Properties and functions of fats, oils and fatty acid (PUFA, MUFA, SFA.	8 8	BG MS SS	WITHIN JULY WITHIN MAY WITHIN MAY

	TFA), Concept of Beta - oxidation of fatty acids	8	SS	WITHIN JUNE
	4. Enzyme Classification, properties and factors affecting enzyme activity. Brief idea on mechanism of enzyme action (Fischer Lock and key model).	6	MS	WITHIN JUNE
	5. Water Definition of water in foods, Wateractivity and its influence on quality and stability of foods,phase transition of food containing water.	6	MS	WITHIN JULY
	FNTGDSE04P- NUTRITIONAL BIOCHEMISTRY(PRACTICAL) **CREDITS: 2** 1. Qualitative tests for the identification of: Glucose, Galactose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2. Qualitative tests for the identification of - Albumin, Gelatin, Peptone, urea, uric acid. 3. Protein estimation by Biuret and Lowry methods.		ENTIRELY BY DP	WITHIN JULY

Academic Calendar

Department of Food & Nutrition(H&G)
2021 1ST , 3rd, 5thsem , CBCS

Semester/ Year	Syllabus Module/ Unit	Teachers	Tentative period of completion
3rd H	**FNTACOR05T: NUTRIENTS METABOLISM(THEORY)**		September
	1.Carbohydrate Metabolism: Glycolysis & its regulation. Glycogen metabolism. Metabolism of pyruvate. Outline ofpentose phosphate pathway. Anaplerotic reactions. Importance of gluconeogenesis.	Debasish mazumdar	
	2. Lipid Metabolism : Fatty acid synthase and de novo biosynthesis of fatty acid; regulation and mechanism of chain elongation. Metabolism of cholesterol, its control and pathophysiological importance. β-oxidation of fatty acids.	Debasish mazumdar	Septemb er- October
	3.Amino acid Metabolism : Essential amino acids. Transamination. Deamination. Transmethylation. Decarboxylation.glucogenicandketogenicaminoacids.Outl ineof urea cycle. Inborn errors of Metabolism.	Debasish mazumdar	Novemb er
	4. Biologicaloxidation Mitochondrial electron transport chain. High energy phosphate bond.Formation of ATP.	Debasish mazumdar	
	5. Nucleic acid metabolism Chemical structure of purine and pyrimidine, Catabolism and anabolism of pyrimidines. Gout - occurrence, prognosis, progression and therapy.	DP	Novembe r- Decembe r
	6.Vitamins Classification, charcateristics and chemical properties of fat and water soluble vitamins. Functions of fat and watersolublevitamins.Hypervitaminosis.RoleofvitaminsA ,D,C, B1, B2B6, B12 and folic acid inmetabolism.	DP	December
	7.Mineral Metabolism Role of minerals in physiology. Trace elements. Sodium potassium balance. Role of calcium, iron and zinc in human body -metabolism, functions, deficiency and toxicity.	DP	January
	Internal exam Scripts will be checked by :- SRI DEBASISH MAZUMDAR& DP		

	FNTACOR05P: NUTRIENTS METABOLISM(PRACTICAL) TOTAL HOURS: 60 2 CREDITS 1. Estimation of Vitamin C in citrus fruits. 2. Estimation of calcium in blood (using kit) and drinking water (Complexometry).3.Estimationofsodiumandpotassiumin blood(usingkit).4.Estimationofironinvegetablesby	DEBOSMITA PATHAK	September -November

Academic Calendar

Department of Food & Nutrition (Honours)
2020-21 1ST ,3rd, 5thsem , CBCS

	spectrophotometry.ESTIMATIONOFDNA(PDAmethod)and RNA(Orcinolmethod)intissuesbyspectrophotometry. INTERNAL PRACTICAL MARKS WILL BE GIVEN BY : SMT DEBOSMITA PATHAK **FNTACOR06T: NUTRITION THROUGH LIFE SPAN(THEORY)**		
	1. Basics of Meal Planning Principles of meal planning,Food groupsandFoodexchangelist,Factorsaffectingmeal planningand food relatedbehaviour	SS	September
	2. Nutrition in Adults and Elderly Physiological changes in elderly..RDAandnutritionalguidelines,nutritional concernsand healthyfoodchoicesfor:Adultmanandwoman,Elderly.	**MS**	September
	3. Nutrition during Pregnancy Nutrition During Pregnancy: Factors (non-nutritional) affecting pregnancy outcome, importance of adequate weight gain during pregnancy,antenatal careanditsschedule,Nutritionalrequirementsduringpregnancy andmodificationofexistingdietandsupplementation,Deficiency of nutrients, specially energy, iron folic acid, protein, calcium, iodine. Common problems of pregnancy and theirmanagements, specially - nausea, vomiting, pica, food aversions, pregnancy inducedhypertension,obesity,diabetes.Adolescent pregnancy.	SS SS M.SINHA	September-er
	4.NutritionduringLactation Nutrition during Lactation: Nutritional requirements during lactation, dietary management, food supplements, galactogogues, preparation for lactation.Care and preparation of nipples during breastfeeding.		October
	5.Nutrition during Infancy Nutrition during Infancy: Infant physiologyrelevanttofeedingandcare,Breastfeeding,colostrum, its composition and importance in feeding, Initiations of breast feeding.Advantagesofexclusivebreastfeeding.Basic principlesof	M.SINHA	October

	breastfeeding. 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, Management of preterm and low birth weight babies. **6. Nutrition for Children and Adolescents** **INTERNAL SCRIPTS WILL BE CHEKED BY: SS AND MS**		

Academic Calendar

DepartmentofFood&Nutrition(Honours)

2020-21 1ST ,3rd , 5th sem , CBCS

	FNTACOR06P: NUTRITION THROUGH LIFE SPAN(PRACTICAL) TOTAL HOURS: 60 2 CREDITS Meal planning and preparation of adequate meal for different agegroupswithspecialreferencetodifferentphysiological conditions: infants, pre-schooler, school children, adolescents, adults, pregnancy, lactation andelderly. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY: SS AND MS**	MS & SS	**September-November**
	FNTACOR07T: ELEMENTARY DIETETICS AND MENU PLANNING (THEORY)		
	1. DieteticsandDietician Definition and objective of dietetics, Dieticians-Definition, Classification andResponsibility	BG	**September**
	2.Foodgroups Four food groups (Caribbean Food Guide; Canadian Food Guide; USA Food Pyramid; British Food Guide; Recommended Nutrient Intake (RNI); Dietary Value Intake; Dietary Reference Value, Five food group system of ICMR. Structure and composition of cereals. Wheat- structure and composition, types (hard, soft/ strong, weak) ,Diagrammatic representation of longitudinal structure of wheat grain. Malting, gelatinization of starch, types of browning- Maillard&caramelization. Rice- structure and composition, parboiling of rice- advantages and disadvantages. Structure and composition of pulses, toxic constituents in pulses, Milk andMilk Products- composition, classification and processing, Eggs- com[position, Meat, fish & poultry- Types, composition, Sugar& Sugar products-Types and composition, Fats & Oils-Types & sources, Food adjuncts- spices, condiments, herbs, extracts;concentratesessences,foodcolours,origin,classification, convenience foods, Bevarages-Tea, Coffee, Chocolate , cocoa poeder-composition	BG	**September -November**
	3.Dietaryguidelines Nutritive values as a basis for classificationof food, Recommended Daily Allowances (RDA), Dietary guidelines for Indians and foodpyramids.	GC	September

	4.MenuPlanning Menu Planning: Rationale for menu planning, Factors affecting food choice, Nutritional factors,other factors; Exchange list and food composition tables for menu planning, Steps in the development of exchange list, Factors tobe considered when planning the regular balanced diet: adequacy, balance caloric control, moderation, variety andaesthetics.	SS	**September**

Academic Calendar

DepartmentofFood&Nutrition(Honours)

2020-21 1ST ,3rd , 5th sem , CBCS

	5. Basics ofdiettherapy Basic concepts of diet therapy: Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets, Nutrientmodifications.	GC	**September**
	6. Diet forhealth care Team approach to health care. Assessment of Patient'sneeds.	GC	October
	7. RoutineHospitalDiet Routine Hospital Diets: Regular,light, soft, fluid, parenteral and enteral feeding. **INTERNAL SCRIPTS WILL BE CHEKED BY: BG AND GC**	GC	October
	FNTACOR07P: ELEMENTARY DIETETICS AND MENU PLANNING (PRACTICAL) TOTAL HOURS: 60 4 CREDITS 1. Planning and preparation of normaldiets. 2. Planning and preparation of different □uiddiets. 3. Planning and preparation of different soft/semi solid diets. 4. Planning and preparation of different nutrientmod□eddiet.	BG GC	September-November
	INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :-BG AND GC		
	SEC SYLLABUS		
	FNTSSEC01M: INSTRUMENTATION **1.Microscopy Brightfield and darkfield microscopy, Optical Microscopy, Phase contrast Microscopy, Inverted Microscopy**	M.SINHA	Septembe r
	2. Chromatography Principles and applications of paper chromatography (including Descending and 2-D), Thin layer chromatography, HPLC. Separation of mixtures by paper / thin layer chromatography	DP	September
	3. Spectrophotometry Principle and use of study of absorption spectra of biomolecules, Analysis of biomolecules using UV and visible range, Colorimetry. Protein concentration of spectrophotometer/ colorimeter.	**DP**	October
	4. Electrophoresis Principle and applications of native polyacrylamide gel electrophoresis	BG	November
	5.Centrifugation Preparative and analytical centrifugation, densitygradientcentrifugationandultracentrifugationSeparation	GC	October

	of components of a given mixture using a laboratory scale centrifuge		
	6. ECG and EEG Principles of ECG and EEG, application of ECG and EEG	**M.SINHA**	**November**
	7. ELISA Principle and applications of ELISA test	SS	September
	INTERNAL SCRIPTS WILL BE CHEKED BY: GC		
			September
	3RD SEM G (DSC) **FNTGCOR03T: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT (THEORY)** **1. Concept on Community Concept and types of Community. Concept of community nutrition, Community health, Factors affecting community health.**	MS	
	2. Nutritional AssessmentNutritional Assessment: Meaning, need, objectives and importance. Method of assessment of nutritional status – Anthropometry, Clinical, Biochemical, Dietary surveys, Vital healthstatistics.	SS	**Septem ber**
	3. Concept of surveillance system 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.	M.SINHA	October
	4. Nutrition InterventionProgrammes Current National Nutrition Intervention Programmes in India- SNP, ANP, Midday meal,	SS	October
	NIDDCP, NPPNB, NNAPP. ICDS,	M SINHA	November
	5. Nutrition Education Nutrition Education: Definition, objectives of nutrition education. Methods of imparting nutrition education.	SS	November
	INTERNAL SCRIPTS WILL BE CHEKED BY: BG AND MS		
	FNTGCOR03P: COMMUNITY, NUTRITION AND HEALTH ASSESSMENT(PRACTICAL) TOTAL HOURS: 60CREDITS: 2 1. Anthropometric Measurement of infant - Height,	GC	September - November

	weight, circumference of chest, mid - upper arm circumference. Calculation of BMI. 2. Clinical assessment and signs of nutrient de ciencies. 3. Diet survey by 24 hours recallmethod. 4. Preparation of homemade ORS. 5. Preparation of low cost and medium cost schooltif n. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :GC** **5TH SEM H** **FNTACOR11T: CLINICAL NUTRITION AND DIET FOR SPECIAL SITUATIONS IN LIFE (THEORY)**		
	1. Nutritional management of physiological stress Nutrition in wound healing, Surgery: Pre and post surgical dietary management, Burns, Classification, Complication, Dietary management, Trauma: Dietary management, Sepsis: Dietary management.	BG	September
	2. Dietary Modification in febrile Condition Acute, chronic and recurrent fevers, typhoid, rheumatic fever, tuberculosis, malaria, H1N1, dengue fever and chikunguinea.	BG	September
	3. Nutritional management of GI diseases Diseases of Esophagus and stomach: Esophagitis(GERD), Dyspepsia, Peptic ulcer, Gastritis, Gastrectomy, Dumping syndrome . Intestinal diseases: Flatulence, Diarrhea, Constipation, Hemorrhoids, Diverticular disease, Duodenal ulcer, Inflammatory Diseases of Bowl: Crohn's disease and ulcerative colitis, IrritablebowlSyndrome, Colostomy,Ileostomy	BG	October-November
	4.Malabsorption syndrome Celiac disease (Tropical sprue),Steatorrhoea, Intestinal Brush border diseases,Protein losing enteropathy	SS	September
	5. Diseases of Gall bladder andpancreas Pathophysiologic changes, etiology and dietary management -(Biliary dyskinesia , Cholelithiasis, Cholecystitis, Cholecystectomy ,Pancreatitis)	SS	October
	6. Liver diseases Pathophysiology,Progression of liver disease, Role of specific nutrients and alcohol in liver diseases. Nutritional care in liver disease in the context of results of specific liver function tests, Viral hepatitis , cirrhosis of Liver, Hepatic encephalopathy, Wilsons disease.	SS	November

	7. Nutrition Management of Renal Disease Etiology and pathogenesis, Clinical and metabolic manifestations Diagnostic tests, Acute and chronic nephritis, Nephrotic syndrome, Renal Failure: Acute and chronic, Nnephroletheasis,ESRD	GC	September
	8. Nutritional management in Allergy Definition, symptoms mechanism of food allergy, Biochemical and immune testing (short), Elimination diets, Food selection, Food allergy in infancy: Milk sensitive enteropathy, intolerance to breast milk, Prevention of food allergy.	GC	September
	9.Neurological diseases Alzheimer's, Parkinson's disease and Epilepsy, Anorexia nervosa andbulimia.	GC	September
	INTERNAL SCRIPTS WILL BE CHEKED BY: SS AND MS		
	FNTACOR11P: CLINICAL NUTRITION ANDDIET FOR SPECIAL SITUATIONS IN LIFE(PRACTICAL) TOTAL HOURS: 60 2 CREDITS Planning and preparation of Diets for the following diseases:i)Pepticulcerii)Viralhepatitisiii)Feveriv)Acute and chronic renal failure **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY : BG AND GC**	MSINHA BG	September-November
	FNTACOR12T: FOOD MICROBIOLOGY AND IMMUNOLOGY(THEORY)		
	1.GeneralIntroductiontomicrobes(Bacteria,Fungus,andAlgae) Classification, Nomenclature and Morphology (external and internal features). Principles of staining.	SS	September
	2. Growth kineticsofbacteria Growth kinetics, Factors affecting growth, different nutritional media for growth, methods of media sterilization.	DP	September
	3. Microbiology of food Microbes commonly present in food and the diseases caused by them, microflora present in milk, cereals, vegetables, flesh food. Seafood and Shell fish poisoning. Mycotoxins, Foodborne Diseases, Prions.	DP	October
	4.Microbial Food Spoilage Sources of Microorganisms infoods, Someimportantfoodspoilagemicroorganisms,Spoilageofspecific food groups - Milk and dairy products, Meat, poultryand	SS	October

	seafoods, Cereal and cereal products, Fruits and vegetables and Canned products. **5.FoodFermentations Fermentation –definition and types, Microorganisms used in food fermentations, Dairy Fermentations starter cultures and their types , concept of probiotics, Fermentated Foods-types, methods of manufacture for vinegar, sauerkraut, tempeh, miso , soya sauce, beer, wine and traditional Indian foods.**	SS	November
	6.Immunesystem Cells & Organs of the immune system, Innate and Acquired, Primary and secondary immune response, Active and Passive, Antigen, Antibody, Haptens, Adjuvants, Immunoglobulin- classification, polyclonal and monoclonal, basic structure and function, antigen and antibody reactions- RIA, ELISA, Immunoblot. Antibody production -processing and presentation of antigen, MHC, Humoral immune response. Cell mediated immunity, Formation, maturation and activation of B and T cells, Immune effectors system- cytokines complement system, K cells and NK cells, Cell mediated effectors response, Interferons, Immunopathology - basic principles of auto immune disease , Vaccine, toxins, toxoids, antiserum. Basic principles of immunological detection of pregnancy and immunohistochemistry. **INTERNAL SCRIPTS WILL BE CHEKED BY: DP**	DP	November
	FNTACOR12P: FOOD MICROBIOLOGY AND IMMUNOLOGY (PRACTICAL) TOTAL HOURS: 60 4 CREDITS 1. Introduction to microbiology: Use of equipments Understanding and use of compound microscope Use of Autoclave Use of Incubator and Inoculation chamber 2. Preparation of different types of media (complex, differential and selective) 3. Preparation of slant, stab and plates using nutrient agar 4. Morphological study of bacteria and fungi using permanent slides 5. Gram staining 6. Bacteriological Analysis of Water by MPN method 7. Ouchterlony double diffusion test in agar-gel. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY : DP**	DEBOSMITA PATHAK	September-December
5th Semester DSE FOR	**FNTADSE02T: ENTREPRENEURSHIP IN FOOD INDUSTRY (THEORY)** **1.EntrepreneurialDevelopmentCASESTUDIESofSUCCESSFULentrepreneURS,**		

FNTA HONS	EXERCISES on WAYS of SENSING opportunities – sources of idea, creating efforts, SWOT 49 Analysis, Entrepreneurial skill assessment test,	GC , RED P0RTI ON PS COM MERC E	September-December

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	TechniquesofdevelopmentofentrepreneurialSkills,positiveselfimageandlocusofcontrol.		
	2.FoodBusinessmanagementCasestudiesofFoodProcessingBusinessandItsaspects,Businessopportunityidentificationand Assessment techniques,BusinessIdeaGenerationandevaluationexercise,Market AssessmentstudyAnalysisofcompetitivesituation,	GC	Septembe r- December
	SWOTAnalysisforbusinessandforcompetitors,Preparationof business plan,Preparationofprojectreport,MethodsofArrangementofinputs– financeandmaterial,Taxplanning.	MS	Do
	3.Personalitydevelopmentandcommunicationskillsno.ofHours20 CommunicationskillsandPersonalityDevelopment,Intrapersonal communicationandBodyLanguage,InterpersonalCommunicationand Relationships,LeadershipSkills,TeamBuildingandpublicspeaking, CorporateGrooming,DressingEtique†e,PreparingforInterview, EmotionalQuotient. **INTERNAL SCRIPTS WILL BE CHEKED BY: GC AND MS**	MS	Do
	FNTADSE02P: ENTREPRENEURSHIP IN FOOD INDUSTRY(PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 1. Preparation of business plan. 2. Preparation of project report. 3. Tax Planning under the head Salary. 4. Visit to a food industry **INTERNAL PRACTICAL MARKS :- POULAMI SINHA COMMERCE**	PS COMMERCE	September- December
	FNTADSE03T: FOOD BORNE DISEASES AND FOOD TOXICOLOGY(THEORY)		

	1. **Food borne DISEASES Definition related to food borne DISEASES, types of DISEASES with example (Pandemic, Endemic and Epidemic). Infection, contamination, decontamination, DISINFection, transmission (direct and indirect). Brief idea about different vector borne DISEASES, mode of TRANSMISSION prevention and control of following DISEASES: Salmonella, Shigella,Typhoid,Botulism,Cholera,E.colifoodpoisoning,Staphylococcal food POISONing, Clostridium infection, Bacillaryinfection.**	DP	September
	2. **Lactose intolerance Lactose intolerance-ITS mechanism and enzyme deficiency.**	DP	October
	3. **MechanismoffoodborneDISEASESMolecularmechanismof foodborne DISEASES.**	BG	November
	4. **Food SAFety Definition: Food SAFety, TYPES of hazards (Biological, chemical and PHYSICal hazARDS), impact on health, control measURES, factors affecting foodSAFety.**	GC	September-November
	5. **HygieneandSAnitationHygieneandSANitation:Contamination,control methODSUsing phYSICAl and chemical agents, USE of preservatives, pest control management, personalhygiene.**	BG	September-November
	6. **FoodsafetymanagementFoodsafetymanagement:ConceptofSAFety management,prerequISITES-GHPs,GMP,HACCPetc.**		December

	7.ToxicagentsinfoodToxicagentsinfood:Botulism,lathyrism, Ciguatoxins,Tetrodotoxins,Saxotoxins,conotoxins,Antivitamins, Haemagglutins,Cyanogenicglycosides,Strychnine,Solanine,atropine, Muscarine. **INTERNAL SCRIPTS WILL BE CHEKED BY: DP**	GC	September - November
	FNTADSE03P:FOODBORNEDISEASESANDFOODTOXICOLOGY(PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 1. Assessment of surface sanitation by swab and rinse method. 2. Assessment of personal hygiene. 3. Designing of various food processing systems and food service areas. 4. Design and layout of cold storage and ware house. 5. Assessment of physico chemical properties of waste water. 6. Isolation and enumeration of bacteria from rottenfoodbreadandvegetables.7.Testingofsanitizersanddisinfectants. 8. Study of phenol coefficient of sanitizers. 9. Visit to Food industry and preparation of report. **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :- DP**	DP	September-December
	5TH SEM G (DSE 1 SYLLABUS FOR FNTG [ONLY FOR DSC]) FNTGDSE02T- FOOD SAFETY AND FOOD PROCESSING **1.Foodadditiveandfoodsafety:Conceptoffoodsafety,factorsaffecting foodsafety,Foodadditives-variousTypesandtheireffectsonhealth.**	BG	September
	2.Foodspoilage:Cereals,Pulses,Vegetables&Fruits,Milk&milk products,Fleshyfoods,Fats&oils.Foodborneinfections&infestation.	BG	October
	3.FoodadulterantsPFAdefinitionoffoodadulteration,Common adulterantsinfoodandtheireffectsonhealth,CommonhouseHold methodstodetectadulterantsinfood.	M.SINHA	September
	4.FoodlawsandregulatoryauthorityNo.ofHours10PreventionofFood Adulteration(PFA)Act,Regulatingauthority-CodexAlimentarius,ISI, Agmark,FruitProductsOrder(FPO),MeatProductsOrder(MPO),Bureau ofIndianStandards(BIS),MMPO,FSSAI.	SS:	September
	5.FoodPreservationNo.ofHours10FoodPreservation–Definition, Objectives,Methods–mainprinciple,procedure,commonexamples.16	M.SINHA	October
	6.Foodadjunctsandpreservedproducts No.ofHours8Spices(Chilies, Turmeric,GarlicandGinger),useandnutritionalaspect.Jams,Jellies, Squashes–usesandnutritionalaspects. **INTERNAL SCRIPTS WILL BE CHEKED BY: BG**	SS	October

	FNTGDSE02P- FOOD SAFETY AND FOOD PROCESSING(PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 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)	GC	September

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	Artificially foreign matter in tea (dust/leaves). 2. Prepa ration of Jam, Jelly, Pickle and Sauce **INTERNAL PRACTICAL MARKS WILL BE GIVEN BY :- GC**		
1ST SEMESTER	CORE COURSE (CC) FNTACOR01T: HUMAN NUTRITION (THEORY) TOTAL HOURS: 60 4 CREDITS 1.IntroductiontoFoodandNutritionNo.ofHours10Foods:Energygiving, bodybuildingandprotective.Nutrients:macroandmicronutrients,Dietand balanceddiet,Menu.Healthandnutritionalstatus.Malnutrition,functional food, prebiotics, probiotics, 8 phytochemicals, nutraceuticals. Fibre. Functions of foods: physiological, psychological, social. Food groups,food pyramid,Relationbetweenfoodandnutrition,healthanddiseases.	GC	September-November
	2. Foods, Nutrients and cooking of food No. of Hours 10 Foods and their nutrientcontents:Nutrientspresentincerealsandmillets,pulses,nut sand oil seeds, fruits and vegetables, milk and milk products, flesh food, eggs, Condiment and spices, salt. Nonnutrient components of foods: phytate, tannins,oxalate,trypsininhibitor,goitrogensandothertoxicagentsin food. Cooking: Beneficial and adverse effects of cooking. Different methods of cooking-dry, moist, frying, and micro wave cooking- advantage, disadvantageandtheeffectofvariousmethodsofcookingonfoods,Solar cooking.	BG	September-November
	3.FoodenergyandenergyrequirementsNo.ofHours15Theenergy value of foods: Physical and physiological calories. Bomb calorimeter Energy requirement of an individual: Basal metabolic rate (BMR) and physical activity..BMR:Measurement(directandindirect),factorsaffectingBMR, SDAoffoods.physicalactivityratio(PAR).Classificationofactivities based on occupations.Nutritional requirements and Recommended dietary allowances(RDA):factorsaffectingRDA,ApplicationofRDA,Referenceman andwoman..	MS	September-November

	4.DigestionofFoodsNo.ofHours25Componentsofgastrointestinaltract. Structure of different segments of GI tract. Digestive glands: structure of salivary glands, gastric glands and intestinal glands. Structure of pancreas andliver.,Digestivesecretions:salivaryjuice,gastricjuice,pancreaticjuices and intestinal juices. Bile and bile secretion. Digestion and absorptions of carbohydrate, protein,lipid, fat soluble vitamins, water soluble vitamins(thiamine, riboflavin, niacin, pyridoxine, folate, vit B12, vit C), minerals (Ca, Fe, I, F, Cu, Zn) **INTERNAL SCRIPTS WILL BE CHEKED BY: SS**	SS Ritwick Acharjee	September-October November

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	FNTACOR01P: HUMAN NUTRITION (PRACTICAL) TOTAL HOURS: 60 2 CREDITS 1. Process involved in cooking, microwave, steaming, grilling, deep fat frying.	GC	September
	2.Generalconceptsofweightsandmeasures,Eyeestimationofrawcooked foods	BG	September
	3. Preparation of food from different food groups and their significance in relation to health	GC	October
	4. Preparation of supplementary food from different age group and their nutritional significance	BG	September
	5. Planning and preparation of low cost diet for Grade I and Grade II malnourished child	BG	October-November
	INTERNAL PRACTICAL MARKS :- BG AND GC		
	FNTACOR02T: PHYSIOLOGY IN NUTRITION (THEORY) TOTAL HOURS: 60 4 CREDITS 1.Unit of Life: Cell and Tissue Structure No. of Hours 12 Differencebetweenprokaryoticandeukaryoticcells&plantandanimalcells, Structure and basic functions of animal cell organelles, Structure and functions of plasma membrane, Role of membrane in transport and communications, Importance of cell junction- tight, gap and desmosome, Types of human tissue- location, structure and functions. Structure of muscles, bones, teeth andjoints.	SS+RITWICK ACHARYEE	September-October
	2.Blood and body fluids No.ofHours12 Blood and its composition, Morphology, formation and functions of formed elements, Blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Mechanism of blood coagulation, Haemoglobin-structure and function.Extracellular fluid, lymph.	MS	September-October
	3.CardiovascularsystemNo.ofHours12Structureofheart,artery,veinand capillary, Properties of cardiac muscle, Cardiac cycle, cardiac output, heart rate, heart sounds, ECG- normal and abnormal. Systemic and pulmonary circulation.Bloodpressure,pulsepressureRadialpulse,coronarycirculation	BG	September-December
	4. Respiratory system No. of Hours 12 Structure of lungs: alveoli and airways. Respiratory volumes and capacities,Mechanics of breathing. Oxygen and carbon dioxide transport, Neural and chemical control of breathing.	MSETH	September-November

	5. Renal Physiology, skin and body temperature No. of Hours 12 Anatomy of renal system: kidney, ureter, urethra and urinary bladder, Nephron: structure, Juxtaglomeralarapparatus GFR and GFI, Tubular functions, Urine formation: Counter current exchanger and multiplier. Role of kidneyin	GC AN D M SE TH	Septemb er- Decemb er

	water and electrolyte balance. pHregulation by kidney. Structure of skin. Sweatandsweatglands.Sebum.Corebodytemperature,heatlossandheat gain, Regulation of bodytemperature. **INTERNAL SCRIPTS WILL BE CHEKED BY: SS, BG.GCMS** FNTACOR02P:PHYSIOLOGYINNUTRITION(PRACTICAL)TOTALHOURS:602 CREDITS 1. Determination of pulse rate in Resting condition and aGer exercise (30 beats/10 beats method) 2. Determinationofbloodpressurebysphygmomanometer(Auscultatory method). 3. InterpretetationognormalECGcurvewith6chestleads. 4. MeasumementofPeakExpiratoryflowrate.(Byspirometer) 5. DeterminationofBleedingTime(BT)andClottingTime(CT). 6. Detection of Blood group (Slidemethod). 7. HAEMOGLOBINESTIMATION **INTERNAL SCRIPTS WILL BE CHEKED BY: SS AND MS** FNTGCOR01T:FOODANDNUTRITION(THEORY)TOTALHOURS:60CREDITS: 4 1. Introduction to Food and Nutrition No. of Hours 4 Definition of Food, Nutrition,Nutrient,Nutritionalstatus, Dietetics,Balancediet,Malnutrition, Energy (Unit of energy – Joule,Kilocalorie).	MS MS MSET H MSET H SS SS M SETH BG BG	September September October November January September October-January

	2. FoodandNutrientsNo.ofHours8Carbohydrate,Protein,Fat,Vitamins and Minerals (calcium, phosphorus, sodium, potassium, iron, iodine, fluorine)-sources,classification,functions,deficiencies ofthesenutrients. Functions of water and dietaryfibre.	GC	September-November
	3. FivefoodgroupsNo.ofHours10Basic5foodgroups:Types,composition, nutritional significance, role of cookery of cereals, pulses, milk & milk products,meat,fish,egg,vegetables &fruits,nuts,oil&sugar.	GC	December-January
	4. FoodChemistryNo.ofHours10Chemistryofcarbohydrate,proteinsand fats. Vitamins andminerals	GC	December-January
	5. Nutrients Metabolism No. of Hours 15 Elementary idea of metabolism, enzymesandhormones-nameandtheirimportantfunctions.Metabolism inbrief(Glycolysis,Glycogenesis,Gluconeogenesis,Cori'scycle,Kreb'scycle, Deamination, Transamination. Role of hormones in carbohydrate metabolism.		

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	6.BasicMetabolismRate(B.M.R)No.ofHours6B.M.R:Definition ,factors affecting B.M.R. and Total Energy Requirement (Calculation of energy of individuals).8	BG	December
	7. Deficiency diseases No. of Hours 7 Deficiency diseases (Nutritional anaemia, PEM, IDD, VAD)- Aetiology, Prevalence, Clinical findings, Prevention & Treatment. **INTERNAL SCRIPTS WILL BE CHEKED BY: BG AND GC**	BG & GC	January
	FNTGCOR01P: FOOD AND NUTRITION (PRACTICAL) TOTAL HOURS: 60 CREDITS: 2 1. Elementary idea of weights & measures.	SS	September
	2. Preparation of cereals, pulses, vegetable, egg, milk, fish, nuts dishes.	SS	October
	3. Planning and preparation of diet of an adult male/female.	MS	November
	4. Planning of a day's diet for pregnant & lactating mother.	MS	December
	5. Preparations of supplementary foods for infants.	SS	January
	INTERNAL PRACTICAL :- SS **NOTE:-** **ALLTHESYLLABUSMUSTBECOMPLETEDTENTETIVELY WITHIN:- FEBRUARY2021**		

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Semester/ Year	Syllabus Module/ Unit	No of Lectures	Teachers	distribution
2nd Semester	**FNTACOR03T: FOOD CHEMISTRY(THEORY)** **1. proteins & amino acids** Proteins: Classification. FUNC,deficiency Protein structure and organization: primary, secondary, tertiary and quaternary structure. Amino acid classification. Physical and chemical properties of amino acid and protein. Biological value of proteins (BV), Net protein utilization (NPU) and Proteinefficiency ratio (PER). **2.carbohydrate chemistry** Carbohydrates: classification- mono-, di- & polysaccharides; func, deficincy Stereoisomerism in carbohydrates. Physical and chemical properties of mono-, di- and polysaccharides; Dietary fibre - definition; Fibre components - cellulose, hemicellulose, pectin substances, lignin. **3, Lipid chemistry** Lipids: Classification- Fatty acids, triglycerides, phospholipids, Glycolipids, sterols and steroids. Eiconoids. Edible fats and oils - physical and chemical properties, Hydrogenation and importance of fats in the diet. Physical and chemical properties of saturated, monounsaturated, polyunsaturated fatly acids, trans fatty acids, phospholipids, cholesterols and liposomes. Essential fatty acids. **4. water** Definition of water in foods, water activity, phase transition of food containing water. Water activity and its influence on quality and stability of foods, methods for stabilization of food systems by control of water activity	**5** 1 1 1 1 1 **6** 1 1 1 1 1 **5** 1 1 1 1 1 **3** 1 1 1	BG BG SS BG	WITHIN MAY JUNE WITHIN MAY WITHIN JULY

	5. physiochemical principles Laws of thermodynamics, Enthalpy, Entropy. Gibbs' free energy Thermodynamics and living system. Definition, explanation, importance and biological application of diffusion, osmosis, absorbtion, absorption, viscOsity and surface tension. Colloids: definition and importance. Acids and bases, Hydrogen ion concentration. Buffers. Oxidation reduction potential of bioactives (e.g. flavonoids, phenolic acids, quinols) and their applications in food systems **6. enzymes** Enzmes: Definition and structure. Enzyme substrate interaction. Enzyme kinetics, MichaelisMenten constant(Km).equation Enzyme inhibition. Factors regulating enzyme activities, Isoenzymes, Pro- enzymes, Ribozymes, Abzymes, Concept of Rate limiting enzymes **INTERNAL EXAMINER :=SS** **FNTACOR03P:** **FOOD CHEMISTRY, BIOPHYSICS AND BIOCHEMICAL PRINCIPLES(PRACTICAL)** 1. Qualitative tests for the identification of: Glucose, Galactose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2. Glucose estimation in blood . 3. Qualitative tests for the identification of - Albumin, Gelatin, Peptone, urea, uric acid. 4. Protein estimation by Biuret and Lowry methods. 5. Estimation of urea and uric acid in blood. 6. Determination of acid value of oils by titrimetric method. 7. Determination of osmotic pressure of colloidal solutions.	**6** 1 2 1 1 1 **4** 1 2 1 1 4 2 2 2 2 2 2	SS SS DP	JUNE JULY ‘=- MAY-JULY

	8. Determination of specific gravity of liquid (fruit juice, blood).	2		
	INTERNAL EXAMINER :- DP **FNTACOR04T: PHYSIOLOGY IN NUTRITION (THEORY)**	**10**		
	1. physiology of excitable cells Different types of muscles and their structures	1		
	Mechanism of skeletal muscle contraction and relaxation,	2	M. SETH	MAY-JUNE 2ND WEEK
	Muscle energetic, Isometric and isotonic muscle contraction.	2		
	Structure of nerves.	1		
	Nerve impulse and its conduction. Synapse and Neuromuscular junctions.	2		
	Synaptic transmission.	1		
	Neutrotrophins	1		
	2. nervous system Brief anatomy of Brain and spinal cord. Central and Peripheral nervous system.	**10** **1**		
	Reflex action and Reflex arc.	1	M.SETH	JUNE 2ND WEEK-JULY END
	Outline of functions of cerebrum, cerebellum, hypothalamus. Autonomic nervous system:	1		
	Sympathetic and parasympathetic nervous system.	1		
	Sensory physiology: Sensory Receptors as biotransducers.	1		
	Brief outline of the special senses.	1		
	Structure and functions of photoreceptors in eye and hair cells in cochlea	3		
	3. reproductive system Structure of ovary, fallopian tubule and uterus.	12		
	Oogenesis and ovulation.	1	MS	JUNE
	Changes during menstrual cycle,	2		

	Hormonal regulation of menstrual cycle and menopause Fertilisation and implantation of blastocysts , Placenta. Hormonal control of pregnancy, parturition, lactation, Structure of testis, prostrate and seminal vesicle. spermatogenesis and its hormonal regulation. 4.**endocrine system** Structure, hormones and functions of pituitary, thyroid, parathyroid, adrenal gland and pancreas. Hypothalamus as an endocrine gland. Gastrointestinal hormones. Growth factors. INTERNAL EXAMINER :- GC **FNTACOR04P: PHYSIOLOGY IN NUTRITION(PRACTICAL)** 1. Test for Visual acuity, Colour vision. 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 in blood or urine. 4. Total count (TC) and Differential count (DC) INTERNAL EXAMINER	2 2 2 1 2 **12** 2 2 2 2 2 2 2 4 4 2 4	GC M.SETH	WITHIN JUNE WITHIN JUNE

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		M.SETH		
4th Semester	**FNTACOR08T: community nutrition(THEORY)** **1.Concept on Community** Concept of Community, types of Community, Factors affecting health of the Community. **2.Nutritional Assessment and Surveillance** Nutritional Assessment Surveillance: Meaning, need, objectives and importance. **3. Assessment methods for human** Nutritional assessment of human: Clinical findings, nutritional anthropometry, biochemical tests, biophysical methods. **4. Diet survey** 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** Clinical Signs: Need and importance, identifying signs of PEM, vitamin A deficiency and iodine deficiency, Interpretation of descriptive list of clinical signs. Nutritional anaemia. Rickets, B-Complex deficiencies. **6. Nutritional anthropometry** Nutritional anthropometry:Need and importance,	**2** **4** 2 2 **5** **1** **2** 1 1 **10** 3 4 3 **10** 1 2 2 2 2 1	SS SS MS SS MS	May 2nd week June 1st week JUNE 1ST WEEK WITHIN JUNE JULY 1ST WEEK

	standard for reference, techniques of measuring height, weight, head, chest and arm circumference, interpretation of these measurements. Growth & Development; Body Composition: Changes through lifecycle Use of growth charts. 7. **Agencies and programmes** International, national, regional agencies and organisations. National nutritional intervention programmes to combat malnutrition:ICDS, Midday meal, Special nutrition program, National programs for prevention of anaemia, Vitamin A deficiency control programme Iodine deficiency disorders. INTERNAL EXAMINER :- MS **FNTACOR08P: COMMUNITY NUTRITION (PRACTICAL)** 1. Anthropometric Measurement of infant - Height, 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, Z scores, body Mass Index (BMI) Waist - Hip Ratio (WHR). 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 INTERNAL EXAMINER : BG	**4** **10** 4 3 3	MS MS SS SS SS BG	MID JULY JULY END WITHIN JULY

	FNTACOR09T: EPIDEMIOLOGY AND PUBLIC HEALTH(THEORY)	**4**		
	1. Introduction on Health Health and its importance: Definition of health (WHO),	1	GC	2ND WEEK OF MAY
	Dimension of health,	1		
	Positive health.	1		
	Determinants of health.	1		
	Concept of disease and its causations**.**	2		
	2. Data of Community health Secondary sources of community health data: Indicators of health. Secondary sources of data from NFHS, Vital Statistics, Census of India, ICMR.	**10**	GC	MAY END
	3.Epidemiology		GC	JUNE END
	Definition of epidemiology,		GC	
	components and aims of epidemiology,		GC	
	basic measurements in epidemiology.		GC	
	Demography and family planning.		GC	
	Brief idea about epidemics,		MS	
	epidemiological methods: analytical epidemiology (case control and cohort study);		MS	
	Experimental epidemiology.		GC	
	Infectious diseases in epidemiology.		GC	
	Dynamics of disease transmission,	**12**		
	modes of transmission of disease.			

	4.Diseases: Prevention and control Epidemiology of diseases, prevention and control [(Nutritionally related disease:- Hyperlipidaemia, clotting disorder, scurvy, beriberi, goiter); (vector borne disease: - HIV/AIDS, malaria, poliomyelitis, dengue, tuberculosis, mumps measles rubella, chicken pox, pertussis, chikungunya);		GC	WITHIN JULY
	(food borne disease:- salmonellosis, shigellosis, **Typhoid** **, botulism,** **amoebiasis,** **rotavirus,** **E.coli food poisoning,** **staphylococcal food poisoning);**		SS	
	(water borne disease: arsenic toxicity, cholera);		MS	
	(non communicable disease:- obesity, diabetes, coronary heart disease)		BG	
	5.Public health Definition of public health, relation between health and nutrition.	3	MS	4TH week MAY

	6. Immunization Immunization : definition. Host defenses and immunity, immunizing agents: its types, national immunization schedule- its importance, immunization in adults and travellers, hazards of immunization health advice to foreign travellers.	2	SS	MAY
	7. Community health care Health care of the community, health care delivery, health care system, Primary health care in India, Indian public health standards for subcenters, PHCs, community health centers. Hospital waste management**.**	**2**	MS	JUNE 1ST WEEK
	8. Community water management Community water management: importance of water to the community, sources of water. Concept of water pollution. Purification of water in small and large **scale.** Drinking water handling and safe drinking water	6 2 2 2	SS	WITHIN JUNE
	9.Community waste management Community waste management: types and methods of disposal of wastes, sewage disposal and treatment**.**	**4**	BG	MAY
	10. Air pollution Air pollution: source of air pollution, factors of air pollution. Indoor air pollution. Monitoring of air pollution. Effects, prevention and control of air pollution. **INTERNAL EXAMINER GC** **FNTACOR09P: EPIDEMIOLOGY AND PUBLIC HEALTH(PRACTICAL))**	**4**	BG	JUNE

	.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.) **FNTACOR10T: DIET THERAPY FOR LIFE STYLE DISORDERS(THEORY)**		GC	WITHIN JULY
	1. Lifestyle disorder Introduction, types, aetiology, management.	**4**	BG	MAY 2ND WEEK
	2. **Diabetes Mellitus** Definition, Etiology, Classification, long and short term complications, Diagnosis, Management (Insulin Therapy, Dietary Management with food exchange list, Exercise,Pharmacological), Role of artificial sweeteners. Overview of special conditions: Diabetes in Childhood, Pregnancy, Role of Nutrition Education, Role of Nutrition in Prevention.	8	BG	MID JUNE
	3. Cardiovascular diseases Prevalence, incidence, mortality with special reference to Indian situation. Patho - physiology and Management of Atherosclerosis, Endothelial dysfunction, Thrombosis, Angina Pectoris, Congestive cardiac failure, stroke, MI. Hyper-lipidemia– classification, diagnosis and nutritional management,	**8**	GC	WITHIN MAY

	Hypertension: Oetiology, Risk factors, Patho-physiology, Management **4.Weight management** Obesity and Overweight: Body weight components, Classification of obesity,(gynoid/android and Regulation hypertrophy/hypersplasia, Etiology and assessment of obesity and prevalence in Indian situation, Complications of obesity. Management: Medical (Pharmacological), Nutrition and lifestyle, Surgical, Behavioural Juvenile Obesity. Underweight: Etiology , Diet management, Eating disorders: (Anorexia Nervosa and Bulimia), Management (Medical,Nutritional care), Psychological support and Prevention. **5.Nutritional management of metabolic disease**: Gout : Role of proteins and purine, Etiology, Symptoms and complications, Dietary management,Inborn errors of metabolism: PKU, MSUD, Glycogen storage disorders, Galactosemia **6. Nutrition and respiratory health** Physiology and functions of the respiratory system, Nutritional management of Asthma 7. **Nutritional management in cancer (Oral and colon)** Cancer: Pathogenesis and progression of cancer, Role of Nutrients and food additives in cancer therapies and their nutritional implications, Symptoms, Diagnosis, Cancer therapies: Nutritional implications, Dietary management 8.**Arthritis and Osteoporosis** Etiology dietary treatment in arthritis and osteoporosis.	**8** **6** **4** **4** **2**	BG GC BG GC GC	WITHIN MID JULY WITHIN JUNE WITHIN JULY WITHIN JULY

	INTERNAL EXAMINER :- BG **FNTACOR10P: DIET THERAPY FOR LIFE STYLE DISORDERS(PRACTICAL)** Planning and preparation of Diets for the following diseases: i)Obesity and Underweight SS ii) Diabetes mellitus SS iii) Hypertension and Atherosclerosis MS iv) Overweight and Underweight SS v) Gout MS vi) Osteoporosis MS INTERNAL EXAMINER :- SS **FNTGCOR02T: HUMAN BODY AND NUTRITION (THEORY)**		SS , MS	WITHIN JULY
2ND SEM GENERAL	**1. Animal cell** Animal cell: definition, structure and functions of different parts. Organelle	**4**	BG	2ND week of MAY
	Blood and body Fluids: Blood, composition, blood corpuscles, functions, blood groups and its importance in transfusion, hazards of mismatch blood transfusion. Rh factor, blood coagulation. Lymph: Composition and function.	**4**	GC	2ND WEEK OF MAY
	Cardiovascular and Respiratory system Heart: Junctionl tissues and functions. Cardiac cycle, cardiac output, blood pressure and its regulation. Mechanism of respiration, Respiratory centre. Respiratory regulation.	**6**	BG M.SETH	2ND week of JUNE
	4. Digestive system and Digestion Digestive system: Structures involved in digestive system (mouth, oesophagus, stomach, small intestine, large intestine,liver pancreas, gallbladder), and their functions, composition of different digestive juices & their functions.	**4**	GC	WITHIN JUNE

	Digestion and absorption of carbohydrate, protein and fat. **5. Excitable cells** Brief description about the mechanism of muscular contraction. Neuro-muscular transmission. 6. **Regulatory systems** General idea about the Hormones in human body and their significance on nutrition. Brief idea about brain and sinal cord. somatic and autonomic control of body INTERNAL EXAMINER :-GC **FNTGCOR02P: HUMAN BODY AND NUTRITION (PRACTICAL)** 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. Identification of permanent sections (Blood cells, Stomach, Small intestine, large intestine, Liver, pancreas). 4. Determination of Bleeding Time (BT) and Clotting Time (CT). 5. Detection of Blood group (Slide method). FNTGCOR04T:DIETETICS (THEORY) TOTAL HOURS: 60 CREDITS: 4 **1. Concept on Diet therapy** Definition and objective of dietetics, Definition-diet therapy, Dieticians;principles and classification of the therapeutic diet. Responsibility of dieticians. **2. RDA, Meal planning and Dietary guidelines** RDA- Definition, Nutritional requirements (RDA), **BG** Principles and objectives of meal planning, **BG**	**8** **4** **8** **4** **6**	BG M.SETH GC SS BG SS	WITHIN JULY WITHIN JULY WITHIN JULY WITHIN MAY 2ND WEEK WITHIN MAY 3RD WEEK

4TH SEM GENERAL	Dietary guidelines of pregnant & lactating women, BG infants(Weaning, supplementary food), DP pre-school children & school children BG (School lunch programme), DP adult males and females, DP old age people. BG 3. **Hospital diet** Hospital diet: regular, soft, fluid, s pecial feeding methods- advantages, disadvantages **4. Dietary management of different diseases** **Dietary management in Gastro intestinal diseases (diarrhoea,** **constipation,** **gastritis,** **peptic ulcer &** **flatulence),** **Fever (short term),** **Diabetes mellitus (Type II - NIDDM),** Heart diseases (hypertension, a therosclerosis, hyperlipidaemia), Liver diseases (infective hepatitis, cirrhosis of liver), Gout, Obesity (including assessment indices), Underweight. **5. Food Allergy** Food allergy- Definition, sources, symptoms, diagnosis, treatment, food intolerance. **INTERNAL EXAMINER:- MS**	**4** **8** **4**	BG BG SS BG	WITHIN JUNE 1ST WEEK WITHIN JULY 2ND WEEK WITHIN JULY WITHIN JULY

	FNTGCOR04P:DIETETICS(PRACTICAL) **TOTAL HOURS: 60** **CREDITS: 2** 1. Planning and Preparation of fluid diet, soft and solid diet. MS 2. Planning & preparation of a day's diet for the following conditions: Peptic ulcer GC Fever, GC Hypertension, GC Diabetes mellitus (Type II NIDDM), MS Hepatitis, MS Obesity. MS **SEC 2** 1. Introduction to clinical nutrition, clinical conditions requiring dietary intervention, role of dietitian in hospitals/clinics, GC staff training, RD –requirements, procedure, functioning. DP 2. Practical 1. Visit to an ongoing program in ICDS: one rural, one urban. (eg. mahilamandal meeting or nutrition week celebration . 2. Visit to a health centre (ANC clinic run by Government health department and observe quality of counseling imparted to pregnant women (especially awareness of anemia, importance of IFA). 3. To visit an NGO either rural or urban and observe one intervention program implemented for 59 women, school children or adolescence (For all the above observation appropriate observation check lists will be made and used) 4. Visit to old age home/Nutrition Rehabilitation Centre/slum area and prepare report on nutritional		GC MS GC Within JULY	Within JULY WITHIN JULY Within JULY

	status /health concern(at least 10 case studies to be done) 5. Internship in any hospital/nursing home -case study of diseases 6. Preparation of visual aids indicating clinical problems related to nutrition – Charts, posters, models etc. and demonstration INTERNAL EXAMINER GC SEMESTER 6 (HONOURS) **FNTACOR13T: FOOD PROCESSING AND FOOD TECHNOLOGY(THEORY)** **1. Food Storage and 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. Classification of food based on pH, Food infection, food intoxication, definition of shelf life, perishable foods, semi perishable foods, shelf stable foods, Storage 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, spices and canned foods. **2. Food preservation** Definition, objectives and principles of food preservation. Different methods of food preservation. **:** Freezing and Refrigeration:Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food. Thermal Processing- Commercial heat preservation methods: Sterilization, commercial sterilization, Pasteurization, and blanching. Drying and Dehydration - Definition, drying as a means of preservation, differences between sun		DP MS	MAY MAY

	drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names of types of driers used in the food industry. Evaporation – Definition, factors affecting evaporation, names of evaporators used in food industry. Units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization. **3. Preserved Products** Jam, Jelly, Marmalade, Sauces, Pickles, Squashes, Syrups types, composition and manufacture, selection, cost, storage, uses and nutritional aspects **4. Food Standards and Food Laws** Introduction on Food standards and Food Laws, FSSAI, ISI, Agmark, FPO, MPO, PFA, HACCP, Codex Aulimentaurius. **5. Food Adulteration** Definition, Classification, Different types of adulterants **6. Food Packaging** Packaging Functions and Requirements,, Printing of packages .Barcodes & other marking, Labeling Laws INTERNAL EXAMINER :-DP MS **FNTACOR13P: FOOD PROCESSING AND FOOD TECHNOLOGY(PRACTICAL) TOTAL HOURS: 60 2 CREDITS** 1. Study on Blanching and Browning Process. 2. Preparation of Fruit preserves(Jam, Jelly). 3. Preparation of vegetable preserves.(Pickles) 24 4. Dehydrated Products – tray drying, sun drying etc. 5. Tomato Processing. 6. Fruit Pulping/Juice/Beverages production. 7. Preparation and Standardisation of Traditional Indian Fermented Food. 8. Visit to Food Processing and Preservation unit.		DP MS DP MS ENTIRELY BY SS	JUNE JUNE JULY JULY WITHIN JULY

	9. Detection of Adulterants in common Food Stuffs like Milk, Oil, Laddu, Turmeric etc. INTERNAL EXAMINER :- SS **FNTACOR14T: RESEARCH METHODOLOGY AND BIOSTATISTICS(THEORY)** **1. Research Methodology** Meaning, objectives and Significance of research. Types of research, research approaches and scientific methods, Research process, Criteria of good research.	6	DEBASHIS MAZUMDAR	WITHIN MAY
	2. Research problem Definition and identification of a research problem, Selection of research problem. Technique Involved in Defining a Problem.	6	DEBASHIS MAZUMDAR	WITHIN JUNE
	3. Study design Meaning and needs of design, important concepts relating to research design, variables, experimental and control groups. (Use examples from epidemiology and clinical trials). Different research designs- exploratory, descriptive, analytical and diagnostic (epidemiology and clinical trials). Pilot studies. Qualitative vs quantitative research**.**	12	EXTENSION LECTURE	WITHIN JULY
	4. Sampling of data and analysis Variable, parameter, statistics. Frequency distribution. Cumulative frequency. Graphical presentation techniques including Histogram, Bar chart, Pie chart along with the concepts of frequency polygon. Mean, median, mode, Standard Deviation and Standard Error of mean .Probability. Normal distribution. Student's t-distribution. Testing of hypothesis - Null hypothesis, errors of inference, levels of significance, Degrees of freedom. **5.Preparation of report** a. Graphical and diagrammatic presentation. b. Interpretation of – Meaning of	12	DR SONALI MUKHERJEE ECONOMICS DEPT	WITHIN JULY

	interpretation, Technique of interpretation, c. Precaution in interpretation- Interpretation of tables and figures. d. Report writing – Significance of report writing, Steps in writing report, Types of reports. **INTERNAL EXAMINER :- DR SM AND DM**		DEBASHIS MAZUMDAR	WITHIN JULY
	FNTACOR14P: RESEARCH METHODOLOGY AND BIOSTATISTICS(PRACTICAL) 1. Assignment for calculation of mean, median, mode, standard deviation, standard error of mean and students' 't' test with provided data.		DR SONALI MUKHERJEE	WITHIN JULY
	FNTADSE05T: DAIRY TECHNOLOGY (THEORY) **1. Introduction** Status of dairy industry in India **2. Physical properties of milk** Color, taste, pH and buffering capacity, refractive index, viscosity, surface tension, freezing, boiling point, specific heat, OR, electrical conductivity. **3. Lactose** Lactose (alpha and beta forms and their differences) Significances of lactose in dairy industry. **4. Milk fat** Composition and structure, factors affecting melting point, boiling point, solubility and Refractive Index, fat constants (saponification value, iodine value, RM value, Polenske value, peroxide value). Chemical reactions of fat (hydrolysis, auto-oxidation), condition favouring auto-oxidation, prevention, measurement of auto-oxidation. **5. Protein and Enzymes** General structure, amphoteric nature, difference between casein and serum protein, different types of casein (acid and rennet), uses of casein,		ENTIRELY BY DP	WITHIN JULY

	fractionation of protein. Enzymes- catalase, alkaline phosphatase, lipases and proteases. **6 .Market milk industry** Systems of collection of milk Reception, Platform testing Various stages of processing Filtration, Clarification, Homogenization, Pasteurization, Description and working of clarifier, cream separator, homogenizer and plate heat exchanger . **7. Milk products** Butter, ghee, flavored milk, yoghurt, dahi, shrikhand, ice-cream, condensed milk, milk powder, channa, paneer, cheese (cheddar). INTERNAL EXAMINER :- DP **FNTADSE05P: DAIRY TECHNOLOGY (PRACTICAL) CREDITS: 2** 1. To perform platform tests in milk.(Acidity,COB,MBRT,specificgravity,SNF). 2. To estimate milk protein by Folin method. 3. To estimate milk fat by Gerber method. 4. Preparation of flavoured milk/. Pasteurization of milk. 5. To prepare casein and calculate its yield. 6. **Visit to a milk industry**. **FNTADSE06T: NUTRITIONAL MANAGEMENT AND COUNSELLING (THEORY)** **1. Basics of diet counselling** Diet Counselling-meaning, significance, process, types Goals of counselling, individuals, group and family counselling, Basic sequence in counselling, Materials needed for counselling –models, charts, posters, AV aids, Hand outs etc, Communication process in counselling and linguistics in clinical dietary practices,	8	DP MS MS	WITHIN JULY WITHIN JUNE

	problems in communication Role of Counsellor & Counselee, Techniques of obtaining relevant information- 24 Hour Dietary recall, List of food likes and dislikes, Lifestyle Dietician as a part of medical team and research team, Impact of counselling on health and disease of individuals – discussion of hospital case studies 2.**Introduction on Psychology and counselling** Introduction to psychology – Definition , Nature and Scope Attention and perception – Types of attention and factors influencing attention , principles of perceptual organization and abnormalities in perception learning and memory- Types of learning, Types of memory, Forgetting and its causes motivation and emotion- Types of motives, types of emotions, emotional expression, Personality- nature and definition , factors influencing personality, Psychoanalytic theory of personality Nature and goals of counselling Principles of counselling, Characteristics of a good counsellor, Ethical principles of counselling, Special areas of counselling: Educational, family, health, community and counselling of alcoholic, and drug addicts. **3. Counselling Skills** Approaches to counselling – Psycho analytic approach, Behaviouristic, Humanistic approach, Pre – Helping phase: Rapport building skills, Attending and listening skills, Stage I skills: Empathy, respect, Genuineness and concreteness, Stage II skills: Advanced empathy, self disclosure, Immediacy and Confrontation. Stage III skills: Goal setting, Action plan Programme and Brainstorming **4. Diet Counselling at Hospital and Community Level** Role of counselling in hospital, Role of counselling in community, Organizing health camps and patient feedback – at hospital level, Organizing health camps and patient feedback – at community level, Diet counselling for obese people, Diet counselling for Diabetics, Diet counselling for CVD, Diet counselling for	10 10 10	PSYA DEPT EXTENSION LECTURE GC	WITHIN JUNE 2ND WEEK WITHIN JULY WITHIN JUNE

	mother and child care, Diet counselling for adolescent, Patient follow up / home visits,geriatric counselling with specific diseases like HIV/AIDS. INTERNAL EXAMINER:- MS GC **FNTADSE06P: NUTRITIONAL MANAGEMENT AND COUNSELLING (PRACTICAL)** **CREDITS: 2** 1. Organizing health camps and patient feedback – both at hospital level and community level 2. Diet counselling for mother and child care,adolescent, obese people, Diabetic patient CVD. 3. Patient follow up / home visits INTERNAL EXAMINER :- BG **6TH SEM G** **FNTGDSE04T- NUTRITIONAL BIOCHEMISTRY(THEORY)** **1. Carbohydrate** Classes of carbohydrates, Properties and dietary importance of starch, sucrose, lactose, glucose and fructose. Metabolism: Glycolysis, Tricarboxylic acid (TCA) cycle, Gluconeogenesis, Glycogenesis, Glycogenolys **2. Protein** Classes, properties, functions and secondary structure of protein (alpha helix, beta pleated sheet). Concept and definition: Complete and incomplete proteins, Biological value, Protein Efficiency Ratio (PER), Net Protein Utilisation (NPU), Essential and non-essential amino acids, Deamination, Transamination and Urea cycle. **3. Lipid** Classes of lipids, Properties and functions of fats, oils and fatty acid (PUFA, MUFA, SFA.	8 8	BG MS SS	WITHIN JULY WITHIN MAY WITHIN MAY

	TFA), Concept of Beta - oxidation of fatty acids	8	SS	WITHIN JUNE
	4. Enzyme Classification, properties and factors affecting enzyme activity. Brief idea on mechanism of enzyme action (Fischer Lock and key model).	6	MS	WITHIN JUNE
	5. Water Definition of water in foods, Wateractivity and its influence on quality and stability of foods,phase transition of food containing water.	6	MS	WITHIN JULY
	FNTGDSE04P- NUTRITIONAL BIOCHEMISTRY(PRACTICAL) **CREDITS: 2** 1. Qualitative tests for the identification of: Glucose, Galactose, Fructose, Sucrose, Lactose, Starch, Dextrin. 2. Qualitative tests for the identification of - Albumin, Gelatin, Peptone, urea, uric acid. 3. Protein estimation by Biuret and Lowry methods.		ENTIRELY BY DP	WITHIN JULY