

## B. Sc. Honourse in Nutrition

### Programme Specific Outcome (PSO)

By the end of the entire program of UG in Nutrition a successfully passed out student will be able to:

- Understanding that Nutrition affects the individual's thinking skills, Behaviour & Health.
- The student will be Know the Dietary pattern, it's vast impact in our daily life and help to reduce the Risk of Chronic Diseases.
- They will have depth knowledge about interrelationship between Drug and Nutrient or Drug-nutrient Interaction.
- Gain comprehensive knowledge in Molecular Biology, Genetics, Toxicology, Biostatistics, Bioinformatics, Biochemistry, Physiology, Microbiology, Sport nutrition etc.
- Learn that Nutrition plays a key role in the Healthy development of our body & mind.
- Nutrition Education may indirectly improve one's self image by improving feelings of wellbeing, improved appearance through weight control, increased motivation, knowledge & skills.
- Pursue Higher study in Nutrition & get opportunity to engage in the new field of Research or work as researcher/ Scientist/ New Food Developer.
- Compete different types of Government Services like Nutritionist, Dietitian, Counsellor, Community development officer, Nutritional Epidemiologist, teacher in schools or Colleges etc.
- Work in Different type of sectors like Food Industry, Food develop Company or they will also develop self-Business as an Entrepreneur.
- Will have the opportunities as Nutritionists, Nutrition Educator, Counsellor, Community Education Officer, Food Technologist, Food Safety Auditor, Food Labelling Specialist, Health Promotion Specialists, Regulatory Affairs Specialist, International Aid/Development Worker, Nutritional Therapist, Dietitian, Health Service Manager, Herbalist, Food Writer, Professional Chef, Personal Trainer, Wellness Consultant, Product/process development Scientist

## Course Outcome

### **NUTHCC-01: Basic Nutrition**

#### **C1 T1: Basic Nutrition (Theory)**

##### **Outcomes:**

- Students will have clear concept, definition about the Nutrition, Food as source of Nutrients, Function of Food, Malnutrition and Health, Food Sanitation & Hygiene, basic Food Groups, B.M.R & it's influencing factors, S.D.A., RDA & dietary guidelines, Reference Man and Reference Woman.
- They will be aware the history of Nutritional Science & it's Scope of Nutrition.
- They will able to formulate RDA, Minimum Nutritional Requirements and Dietary Guidelines of an individual as per their Working Activity.
- They will learn about the body composition and changes through the life cycle.
- They will have idea of Energy and its unit, energy balance, assessment of energy requirements, Other Nutritional Requirements, deficiency and excess, determination of energy in food.
- They will also study the Function of Nutrients- Carbohydrate, dietary fibre, protein, fat, vitamins, minerals, anti-oxidants, water & Interrelationship between nutrition and health- Visible symptoms of goods health.
- They will acquire knowledge about Fitness, Athletics and Sports.
- Students will learn what is Food Guide & how to use Food Guide (according to RDA).
- The students will be well informed about the Effect of Cooking and heat processing on the Nutritive value of foods & Processed supplementary foods.

#### **C1 P1: Basic Nutrition (Practical)**

##### **Outcomes:**

- Students will learn the Use and care of kitchen equipment, Portion size, Household measures of raw and cooked foods.
- They will able to set up the Standards of good Food preparation and can apply the appropriate Cooking methods which are used in various Healthy recipe.
- They will able to classifying recipes as good, moderate or poor, sources of specific nutrients, Amount of ingredients to be in standard recipe, basic preparation and their nutritive value, etc.
- They will have comprehensive knowledge in the practical field & will be expert in making the different types of recipe with Cereals and flour mixtures, Vegetables and fruits, Milk and

milk products, Meat, Fish, Poultry & beverages (tea, coffee, cocoa, fruit juice, milk, milkshakes, etc.), Soups, Snacks.

## **NUTHCC-02: Food Science and food commodity**

### **C2 T2: Food Science and food commodity(Theory)**

#### **Outcomes:**

- Students will obtain the Basic concept on Food, Nutrients, Nutrition, Sensory characteristics of food, Food behavior & modification of food behavior, Glycemic Index, Sweeteners, Amino acids, BV, PER, NPU, PUFA, MUFA, SFA, W-3 fatty acid, Raising and Leavening agents & Uses in cookery and bakery, Storage, New food: fast food, junk food, GM food, Free food, Food preservation, Food processing, Fermentation, Food adulteration and Food storage, Food Adjuncts: Spices, Condiments, Herbs, Extracts, Concentrates, Essences, Food Colors, Origin, Convenience Foods and contribution to diet.
- They will be able to Classify Food & Nutrients.
- They will also study about different Food Standards: ISI, Agmark, FPO, MPO, PFA.
- The students of the Nutrition Dept. will have deep knowledge regarding Macro & Micro nutrients (Carbohydrates, Lipids, Proteins, Minerals & Trace Elements, Vitamins, Water) and their Definition, Classification, Structure & Composition, Properties, Sources, Daily requirements, Functions, Bio-Chemical and Physiological Role, bio-availability, Effects of too high - too low on health. Digestion & Absorption.
- They will learn about Dietary Fibre & their Classification, sources, composition, properties & nutritional significance.
- They will have comprehensive understanding in the topic Food Science and Food Commodities (Cereals and Millets, Pulses and Legumes, Milk and Milkproducts, Eggs, Meat, Fish and Poultry, Vegetables and Fruits, Sugar and Sugar products, Fats and Oils, Salt, Beverages, etc.) & also know their structure, production, grade, quality, processing, storage, use in various preparations, variety, selection, nutritional aspects and cost, shelf life and spoilage.
- They will get an idea about Food Preservation & Preserved Products: Jams, Jellies, Pickles, Squashes, Syrups types, composition and manufacture, selection, cost, storage, uses and nutritional aspects.

## **C2 P2: Nutritional Biochemistry (Practical)**

### **Outcomes:**

- Students will be able to identify Mono, Di and Polysaccharides in unknown mixtures of samples of Carbohydrates & also get the clear idea about the Biochemical Reaction between the Mono, Di and Polysaccharides.
- They will estimate the amount of reducing and total sugars in foods, lactose in milk.
- They will know details about Reactions of fats and oils & also Determine the Acid value, Saponification of natural fats and oils.
- They will study about Proteins & also know the Reactions of proteins in foods, Reaction of amino acids and their identification in unknown mixtures.
- They will be able to estimate total nitrogen of foods by Kjeldhal method.

## **NUTHCC-03: Nutritional Biophysics and biochemistry**

### **C3 T3: Nutritional Biophysics and biochemistry (Theory)**

#### **Outcomes:**

- Students will be able to know the interrelationship between biochemistry and other biological science.
- By studying Biophysics, they will grow their general idea of biophysics in nutrition.
- They will learn the Basic process, principles and nutritional importance of Diffusion, Osmosis, Absorption, Viscosity, Surface tension, Colloids, Thermodynamics, Acid, Base, Buffer, pH and Acid-Base balance, Fluid, Electrolytes and Acid-Base balance, etc.
- They will develop interest in Molecular aspects of transport: Passive diffusion, facilitated diffusion, active transport & also in Intermediary metabolism: Carbohydrate Metabolism, Lipids, Proteins.
- Students will learn the concept about Enzymes & Definition, types and classification of enzymes, coenzymes. specificity of enzymes, Isozymes, enzyme Kinetics including factors affecting enzyme action, velocity of enzyme catalyzed reactions, enzyme inhibition.
- They will acquire knowledge regarding Lipoproteins & their Types, composition, role and significance in disease.
- Students will also get an idea about Nucleic acids & their Structure, replication, transcription, genetic code & gain elementary knowledge of biosynthesis of proteins.

### **C3 P3: Nutritional Biophysics and biochemistry (Practical)**

#### **Outcome**

- The students of this Dept. will study the general properties of urease and salivary amylase & learn about the Preparation of buffer of particular PH (Phosphate buffer, tris buffer).
- They will also Determine the strength of KMNO<sub>4</sub> using primary standard (oxalic acid).
- They will gain Knowledge about different techniques like Electrophoresis, Dialysis.

### **NUTHCC-04: HUMAN PHYSIOLOGY**

#### **C4 T4: HUMAN PHYSIOLOGY (Theory)**

#### **Outcomes:**

- Students will able to know the Cell structure and function.
- They will have clear concept of Blood cells: Haemoglobin, Blood groups, Coagulation factors, Anaemia.
- They will have prevailing knowledge in Skeletal System (bones, joints and bone deformities), Cardiovascular System (Cardiac cycle, Cardiac output, Blood pressure, Hypertension, Radial Pulse), Lymphatic System (Lymph glands and its function, Spleen-Structure and functions), Respiratory System (Ventilation, functions, Lungs volume and capacities), Gastrointestinal System (Structure of various parts of the GI tract, Digestion and absorption of Carbohydrate, protein and fat. (Digestion and absorption of Carbohydrate, protein and fat), Excretory System (Structure of Nephron, formation of urine).
- They will grow interest in Endocrinology (List of endocrine glands, Hormones their secretion and function).
- Students of this Dept. will study about Central Nervous System: Parts, Sliding filament theory, neuromuscular junction, wallerianegeneration, Motor Nervous System- Upper Motor Nervous System and lower motor Nervous System. Sensory Nervous System, Sympathetic and Parasympathetic nervous system.
- They also gain knowledge regarding Reproductive System: Structure and functions of male and female reproductive organs, Menstrual cycle, Puberty, Menopause, fertilization and development of fertilized ovum, placenta and its function.
- They will learn about Skin (Structure and function of skin) & Special senses: Structure and function of eye and ear, common diseases in eye and ear.

#### **C4 P4: HUMAN PHYSIOLOGY (Practical)**

##### **Outcomes:**

- Students will learn about Identification & Preparations of Slides: Lungs, Supra Renal Gland, Thyroid, Pituitary, Testis, Ovary, Kidney, Liver, Pancreas, Small Intestine, Large Intestine, Spinal cord, Cerebellum.
- They will be able to Prepare of blood film and identification of white blood cells, Differential count.
- The Department also teaches about Determination of Bleeding time and clotting time of blood, Blood grouping.
- They will Measure Blood pressure and Pulse Rate of an individual & also aware them about their health condition.
- They will also learn about Elicitation of Reflexes and jerks.
- They will Estimate the amount of haemoglobin, RBC, WBC, TLC, DLC & ESR.

#### **NUTHCC-05: Family meal management and meal planning**

#### **C5 T5: Family meal management and meal planning (Theory)**

##### **Outcomes:**

- Student will have learned about Nutrition during Pregnancy (Physiology of pregnancy, factors affecting pregnancy outcome, importance of adequate weight gain during pregnancy, antenatal care and its schedule, Nutritional requirements & modification of existing diet & supplementation, nutritional factors affecting breast feeding. Deficiency of nutrients and impact on health, Common problems of pregnancy and their managements, Adolescent Pregnancy.
- They will also learn about Nutrition during Lactation: Physiology of Lactation, Nutritional requirements, dietary management, food supplements, galactogogues, preparation for lactation. Care and preparation of nipples during breast feeding.
- They will gain clear concept about Nutrition during infancy (colostrum's, its composition and importance in feeding, Advantages of exclusive breast-feeding, Nutritional, complementary foods, management of weaning, breast feeding etc. Bottle-feeding circumstances under which bottle-feeding is to be given. Care and sterilization of bottles, Preparation of formula, mixed feeding, breast feeding and artificial feeding, Teething and management of problems).
- They will know Nutrition to toddlers/preschool/school going children or adolescent & Management of preterm and low birth weight children – their special needs.
- The students get idea in Growth and development from infancy to adulthood & Importance of nutrition for ensuring adequate development, Preventions of growth faltering.

- They will expert in Growth assessment by Height, Weight, BMI, Skin fold thickness, Waist Hip Ratio.
- . They will able to know about Geriatric nutrition (Dietary requirement, Geriatric health problems, Nutritional care), Sports Nutrition (nutritional demand on different sports and dietary recommendations) & Space Nutrition (Body composition changes in space, special diet in space persons)
- They will also learn to designed Meal planning for the family, Indian meal pattern-vegetarian and non- vegetarian & gain idea about Nutritive value of common Indian recipes, Food faddism and the faulty food habits.

#### **C5 P5: Family meal management and meal planning (Practical)**

##### **Outcomes:**

- Students will expert in Planning and preparation of balanced diet for a pregnant women & during complication of pregnancy, a lactating women, a pre-school child, school going child & Preparation of packed lunch, adolescents, adult men and women, senior citizen according to their different Physical activity and economic status.
- They will Prepare diet chart for infant including weaning food.

#### **NUTHCC-06: COMMUNITY NUTRITION AND NUTRITIONAL EPIDEMIOLOGY C6 T6:**

##### **Community Nutrition and Nutritional Epidemiology (Theory)**

##### **Outcomes:**

- Students will able to develop the basic Concept of community, types of community, factors affecting health of Community, Biomarkers and nutrient intakes.
- They will able to Interpret of the nutritional assessment data & learn its significance, Nutritional Anthropometry, Biochemical tests and Biophysical methodology (Merits, Limitations), Determining Validity and Reliability.
- They will gain clear knowledge about Diet Survey: Need and importance, methods of dietary survey- Merits and Limitations, Family food security, Food availability, factors affective food availability and its consumption.
- They will able to know identification of Clinical Sign of PEM, vit-A, Vit.-D & iodine deficiency (Merits, Limitations, Need and importance, clinical signs) , Classification of clinical sign according to WHO.
- They will aware about Nutritional problem in the community, Dietary Exposure National, Household, Institution and Individual level (NHFS and NNMB), Sources of errors for different methods of measurement relating to nutritional exposures.

- Students will know about the importance of National Nutritional Intervention Programme to combat malnutrition, Malnutrition and Infection vicious cycle UNICEF conceptual model of Malnutrition, Comparison with norms, standards, Z-scores, Infection and Immunization: Importance and Schedule of Vaccination of Children, Adult and foreign travelers, Full and partial immunization, Role of community for universal vaccination implementation.

- They will learn Principles of Epidemiology: Concept of disease, rate of a disease in a population (attack rate, morbidity rate, mortality rate, incidence and prevalence rate), Epidemiological methods: descriptive studies, analytical studies and experimental studies, Epidemiologic approach – time, place, person distribution. Determinants of disease. Vital statistics and their significance, Demography cycle and its applications. Socio-demographic and psychosocial variables.

- Students will learn about Public health hazards from contaminated foods.

### **C6 P6: Community Nutrition and Nutritional Epidemiology (Practical)**

#### **Outcomes:**

- Students of this Dept. will visit Field survey or Diet and nutrition surveys in the various types of Community.

- They will be well informed about different Vulnerable and risk groups.

- They will gain knowledge from the survey for breast feeding and weaning practices of specific groups.

- They will learn about the Techniques & Uses of anthropometric measurement of children and adolescent girls and boys.

- Students of this Dept. will conduct Awareness Programs, Nutritional Surveillance & also Prepare different types of Visual Aids to highlight community nutrition,

- They will Observe the working of nutrition and health oriented programs & interpret survey based result from Field survey.

### **NUTHCC-07: Basic Dietetics**

#### **C7 T7: Basic Dietetics (Theory)**

#### **Outcomes:**

- They will learn what is the Role of dietician in hospital and community.

- They will gain Basic Concepts of diet therapy, Principle of diet therapy and therapeutic nutrition for changing needs, Routine Hospital Diets: Regular, light, soft, fluid, parenteral and enteral feeding, Feeding problems of children (infants and children).

- The Students will able to know what kind of diet suggested for febrile conditions, infections and surgical conditions, Gastro-intestinal disorders- Constipation, diarrhoea, peptic ulcer, Renal Diseases- Nephritis, Nephrotic syndrome, Renal failure, obesity, diabetes mellitus & different cardiovascular disorders.



- Students will know which type of diets or nutrition suggest in Cancer, Immune system dysfunction (AIDS & Allergy), Metabolic disorder, Burn and surgery.
- They will also learn Addictive behavior in anorexia nervosa, bulimia and alcoholism.
- They gain comprehensive knowledge in Nutrient Drug interaction.
- They will expert to organize Nutrition education program in general & will able to do Patients check-up and dietary counselling, educating the patient and follow up (Nutrition and diet clinics).

#### **C7 P7: Basic Dietetics (Practical)**

##### **Outcomes:**

- Students will acquire the deep knowledge about planning and preparation of Therapeutic Diets as well as normal diet like fluid diets, soft/semi solid diets, high and low calorie diets, Low and medium cost diets for PEM.
- They will also get clear concept about different types of Disease conditions (diabetes mellitus, hypertension and atherosclerosis nephritis and nephrotic syndrome Ulcers, PEM, anaemia and vitamin A deficiency).
- They will give idea about proper guidelines and also advice which food should be included & avoided in the diet

#### **NUTHCC-08: Diet and Diseases**

#### **C8 T8: Diet and Diseases (Theory)**

##### **Outcomes:**

- Students will able to clear the concept Inborn error of metabolism – Lactose Intolerance, Galactosamia, Phenylketonuria and its dietary management.
- The student of this Dept. will gain knowledge about Etiology, symptoms, diagnostic tests and dietary management of intestinal diseases: Diarrhea, Steatorrhea, Diverticular disease, Inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, Irritable Bowel Syndrome, Haemorrhoids, Malabsorption syndrome, Celiac sprue, tropical sprue, Intestinal brush border deficiencies (Acquired disaccharide intolerance), Protein losing enteropathy, Viral Hepatitis, Cirrhosis of liver, Wilson's diseases, Gall Bladder and Pancreas, Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis, Arthritis and gout.
- They will learn the importance of RUTF.
- They will have learned about liver disease, Exocrine Pancreas and Biliary System, Liver function tests, application of diet therapy and nutritional care in liver disease.
- They will know the Pathogenesis and dietary management - Nutritional Anaemias, Sickle Cell Anaemias, Thalassemia, Anaemia resulting from Acute Haemorrhage.

## **C8 P8: Diet and Diseases (Practical)**

### **Outcomes:**

- Students will expert in Planning and preparation of Therapeutic diet for a diarrhoea patient, Steatorrhoea patient, Diverticular disease patient, Ulcerative Colitis patient, Flatulence patient, Constipation patient, Irritable Bowel Syndrome patient, Haemorrhoids patient, Celiac sprue patient, Viral Hepatitis patient, Cirrhosis of liver patient, Cholelithiasis patient, Pancreatitis patient, Anaemia patient, Thalassemia patient and also give them dietary advice.

## **NUTHCC-09: Food Microbiology**

### **C9 T9: Food Microbiology (Theory)**

#### **Outcomes**

- Students will have introduced to microbiology and its relevance to everyday life.
- They will also overview on Cultivation of microorganisms (Nutritional requirements, types of media, methods of isolation).
- They will also learn about Primary sources of microorganisms in foods, Growth of microorganisms, Growth curve, effect of environmental factors in growth, Physical and chemical methods used for destruction of microorganisms (sterilization and disinfection).
- They will aware the role of microorganisms on Food Spoilage (cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and milk products, canned foods).
- They will able to set up microbiological standards, assess the microbiological quality of food.
- Students will know about principles of GMP & HACCP in food processing & they have learn to Safety management at household and industrial level.
- They will study about different types of Foodborne infections (Salmonellosis, Shigellosis and Listeriosis), Food poisoning (Staphylococcal and Botulism), Water and water borne diseases, air and air borne diseases, soil and soil borne diseases, sewage and diseases & also know about the aflatoxin intoxication.
- Beside this they will gain comprehensive knowledge about beneficial effect of microorganisms (probiotics and related factors) & will know about. Fermented Foods and its importance.
- Students will able to Planning for waste disposal methods - solid & liquid wastes (Waste product handling).

### **C9 P9: Food Microbiology (Practical)**

#### **Outcomes:**

- Students will Study about different equipment used in a microbiology lab.
- They will Prepare different culture media.
- They will also learn idea about Staining of bacteria with gram staining and can differentiate between gram positive & gram negative bacteria.
- They will perform Microbiological examination of milk (Methylene blue reduction test).
- They will have comprehensive knowledge about Preparation of traditional Indian fermented food and its quality checking e.g. testing of physical, chemical and nutritional properties.

### **NUTHCC-10: Food processing and Preservation**

#### **C10 T10: Food processing and Preservation (Theory)**

#### **Outcomes:**

- Students will able to know the Significance, principles of different methods of food processing: thermal processing- Cooking (moist heat, dry heat, combination method of cooking), blanching, pasteurization, sterilization, canning, microwave cooking and solar cooking.
- They will learn the Principles of freezing, changes occurring during freezing. Types of freezing - slow freezing, quick freezing.
- They will have complete idea about Food preservation by drying and dehydration, differences between sun drying and dehydration (i.e. mechanical drying), types of driers used in the food industry & Preservation by Irradiation: Units of radiation, kinds of ionizing radiations used in food irradiation. Mechanism of action, concept of cold sterilization.
- They will get idea about Principles and methods of making pickles, jam and jellies from different vegetables / fruits, preparation of food from cereals, meat, fish, poultry and egg products. C10 P10: Food processing and Preservation (Practical) Outcomes:
- Students will get proper knowledge about Different methods of cooking & Experimental Cookery on Milk, Egg, Vegetables (effect of shredding, dicing, acid and alkali, pressure cooking, steaming with and without lid), Fruits (Prevention of browning on fruits).
- They will able to estimate the Sodium, Potassium, Calcium and Iron in different food staffs & know the Estimation of vitamin C content of food by biochemical method.
- They will Visit to a food processing industry and gain knowledge about Food processing, storage, preservation & Food sanitation & Hygiene.

### **C10 P10: Food processing and Preservation (Practical)**

#### **Outcomes:**

- Students will get proper knowledge about Different methods of cooking & Experimental Cookery on Milk, Egg, Vegetables (effect of shredding, dicing, acid and alkali, pressure cooking, steaming with and without lid), Fruits (Prevention of browning on fruits).
- They will able to estimate the Sodium, Potassium, Calcium and Iron in different food staffs & know the Estimation of vitamin C content of food by biochemical method.
- They will Visit to a food processing industry and gain knowledge about Food processing, storage, preservation & Food sanitation & Hygiene.

### **NUTHCC-11: Public Health and Hygiene**

### **C11 T11: Public Health and Hygiene (Theory)**

#### **Outcomes**

- Students will have acquired knowledge Food adulteration, common, adulterants & health hazards, Consumer rights, Food standards and food laws. Central facilities for assessing food adulteration, Role of food inspectors.
- Students will have learned about importance of safe drinking water/portability and tests for portability, water borne infectious agents, etiology and effects of toxic agents, Waste Management (sewage disposal and treatment, solid waste and disposal, liquid waste disposal).
- They will be differentiating between Food borne infections (Typhoid, cholera, hepatitis, amoebiasis) & Food borne intoxications (natural, chemical, microbial).
- They will learn about the importance of Food handling and Public Health, sanitation, hygienic in food handling and personal hygiene of food handler Preventing food borne illness and communicable diseases.
- They will know Indices of thermal comfort, Pollution (Sources, Pollutants, Monitoring, Effects, Prevention & control).
- They will able to know Mental health & Prevention of mental diseases, mental health services in India.
- They will be well informed about Three-tier health care delivery system, Primary health center, Sub Centre, CHV, Urban health infrastructure.
- They will learn Demographic cycle, Population Pyramid, Fertility, Population explosion, Approaches for population control, Family planning methods.

### **C11 P11: Public Health and Hygiene (Practical)**

#### **Outcomes:**

- Students will perform Assignment programs on public health, nutrition and disease covering the following fields- Protein under nutrition and its recovery, Vitamin or Mineral under nutrition and its recovery, Dietary management of non communicable disease, Dietary management of growing child, Impact of nutrition education on awareness development in the field of personal health.

### **NUTHCC-12: Research Methodology**

#### **C12 T12: Research Methodology (Theory)**

#### **Outcomes:**

- Students will gain knowledge regarding Research Methodology, & Objectives, Motivations, Criteria in good Research, of Good Research, Types of Research (Fundamental, Applied, Action, Qualitative, Quantitative, Historical).
- They will Defining the Research Problem (Scientific Problem, Formation of scientific Problem, criteria of good research problem).
- They will aware by the Meaning, Objectives, Need and importance of Review of Literature, of Review of Literature
- They will define Hypothesis& know the Functions, types, Characteristics of a Good Hypothesis. • Students will able to perform Sampling process based on Criteria, Design, Characteristics of good sampling, types of sampling method.
- They have lean about Methods of Data Collection (Primary and secondary data, Criteria of good data, Observation Method, Interview method, questionnaire and Schedules, Case Study Method).
- They will create Experimental design (single and multi-group, Quasi)
- They will know Code of Ethics in Research, Importance of Ethics in Research.

#### **C12 P12: Research Methodology (Practical)**

#### **Outcomes:**

- Students of this Dept. will have to submit a Project work on public health / nutritional biochemistry / nutritional survey to be submitted.
- They will able to Formulate the Project wok, know about Meaning of scientific research and its methods, create project design, use of proper methods, Tools and techniques.
- They will observe, make schedules or rating scale & also learn about tabulation and interpretation.

- They will perform graphic representation of data and its interpretation, bar diagram, pie diagram.
- They will learn about proper Statistical procedures - variables, mean, standard deviation, test of hypothesis (t-test), chi-square test, degrees of freedom, null hypothesis, z-score.

## **NUTHCC-13: Dietetics and Counselling**

### **C13T13: Dietetics and Counselling (Theory)**

#### **Outcomes:**

- Student can learn about Introduction to Psychology and counselling They will gain knowledge about Definition, Nature and Scope in psychology, Attention and perception, Learning and memory, Motivation and emotion, Personality, Psycho analytic theory of personality, Ethical Principles of counselling.
- Students will have learned about Counselling Skills They will be understanding the different Approaches to counselling (Psycho analytic approach, Behavioristic, Humanistic approach). They will aware about Pre – Helping phase (Rapport building skills, Attending and listening skills). They will learn about Action plan Programme and Brainstorming.
- Students will know about , Basics of Diet Counseling Students will learn meaning, significance, process, types, process, Goals of Diet counselling, Basic sequence in counselling, Techniques, Materials needed for counselling (models, charts, posters, AV aids, Handouts etc.), Communication process in counselling and linguistics in clinical dietary practices, problems in communication. They will know Role of Dietician as a part of medical team and research team & also know the Impact of counselling on health and disease of individuals – discussion of hospital case studies. Processes involved in dietary counseling: They will able to Design & Implementation of counselling plans, managing resources, facilitating self-management of disease condition, evaluation instruments, Counseling approaches after evaluation.
- Students will gain basic knowledge about Practical consideration in giving dietary advice and counselling They will know about the Factors affecting an individual food choice, Consideration of behavior modification, give Dietary advice & Motivation.
- Students will know about Counselling and educating patient They will learn about nutrition counselling, role & Responsibilities of nutrition counsellor, Practitioner v/s client managed care and also develop their Conceptualizing entrepreneur skills & behavior, Communication & negotiation skills.
- Student will learn about Use of Teaching aids by dietitians Students will have the capability to prepare Charts, leaflets, posters etc., teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.
- Student can perform Counselling at Hospital and Community level They will play Role as a counsellor in hospital & community. They will Organize health camps and patient feedback – at hospital level & community level. The students will formulate Diet counselling plans for

Geriatric, Obese people, Diabetics, CVD, Dyslipidemia, Cancer risk prevention, Renal diseases, Liver disorders, Mother and Child care, Prenatal and Pregnant women, Lactating women, Childhood nutrition problems like-SAM, weight management, vitamin and mineral deficiencies, School children, Adolescents, Young Adults, eating disorders. They will also gain knowledge in fitness, weight management, counselling. Patient follow up / home visits.

- Student will know the Computer application Students will learn to Execution of software packages, Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients & also draw Statistical computation- mean, median, standard deviation, conclusion and regression test.

- Student will learn about Computer application in dietetic management They will Use of computers as a Dietitian in Dietary computations, Dietetic management, Education/ training, Information storage, Administrations, Research.

- Students will know about Nutritional/medicinal role of traditional foods They will aware by the Traditional food beliefs, role of Ayurveda, Naturopathy, Yoga and other traditional medicines in disease management.

### **C13 P13: Dietetics and Counselling (Practical)**

#### **Outcomes:**

- Students will able to perform the Computer application for collection of data of different diseases & also Submit computed data.
- They will able to Prepare teaching aids in the field of nutrition.
- They will be aware & prepare case history of a patient and feeding of information in the hard disc.
- They will Understand the use of conventional and non-conventional methods of counseling like Face to face counseling, Use of software for counseling e.g. Diet Cal, Use of any one Diet App for counseling and assessing food intake.
- They will have the ability of Planning Nutrition counseling sessions and identifying ways to adhere to dietary changes for the following conditions: Lactation counseling, SAM. Eating disorders, Overweight / Obesity in School children, adolescent and adults, Metabolic syndrome, Diabetes- Gestational Diabetes, Renal disease, Liver disorders.
- They will Organize health camps and patient feedback – both at hospital level and community level.
- They have to submit Project planning for any one disease topic.

**NUTHCC-14: Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units**

**C14 T14: Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units (Theory)**

**Outcomes:**

- Entrepreneurship development The students will learn the definition, concept, need, significance of entrepreneurship development in India, entrepreneurship growth process, barriers, entrepreneurship education model and also know about Entrepreneur, their role or demands, Entrepreneurial motivation, Challenges faced by Women Entrepreneurs.
- Enterprise Planning and Launching They will expert in Enterprise Planning and Launching business, assessing market potential, appraising of project and feasibility.
- Enterprise Management and Networking Students of this Dept. will have ability to Organize and Management Managing Production, Organizing Production, Managing marketing, Financial Management, Budgets and Budgeting process, Estimation of project cost & Profit Assessment.
- Personnel management They will know the Functions of a personnel manager, Type of service, Job description and job specification.
- Food service units, Menu planning, Food production process, Space and equipment They will learn about food service units, Food Production Process & techniques, Standardization of recipes, Importance of Menu Planning, Space and Equipment, Food hygiene and sanitation.
- Planning of a small food service unit They will able to Preliminary Planning, identifying resources, Developing Project plan, Determining investments.
- Development of a business plan They will able to develop a new business plan in the future as an entrepreneur.

**C14 P14: Entrepreneurship development, Enterprise management and Entrepreneurship for small catering units (Practical)**

**Outcomes:**

- Students will able to SWOT analysis with respect to entrepreneurial competencies through case profiling of successful entrepreneurs and enterprises.
- They will Achieve Motivation for lab-development of entrepreneurial competencies, Survey of an institution facilitating entrepreneurship development in India & also Prepare business plan.
- They will survey for food items both raw and processed, food service units in the market & will make Standardization of a recipe & also Preparing Quick Foods for scaling up for quantity production.



- They will Plan menus for the following: Packed meals for office employees, Nutritious Tiffin for school children, School/college canteens.
- They will perform Demonstration of a specialized cuisine.
- Students will Develop a checklist for good hygiene practices.

## **NUTHDS**

### **Outcomes:**

- Students will know about Chemical Safety of Foods, Microbiological Safety of Foods.
- Students will learn about Food Sanitation and Hygiene & also upgrade the practical knowledge by the survey or field visit.
- They will get idea about Quality Assurance in Food Sectors, Food Quality and Sensory Evaluation, Quality Control and also aware the history of Food Standards.
- They will acquire knowledge about Geriatric Nutrition, their physiological problems, their Nutritional Requirements, their food habits & dietary modification.
- They will get idea about Nutrition communication for Health promotion.
- They will learn Personnel management and Food service management/
- They will perform the Methods for Epidemiological Data Analysis.
- They will have comprehensive knowledge about Food packaging, Bakery Technology and Mushroom Culture, Sea food and Dairy Technology.

## **NUTHSE**

### **Outcomes:**

- They will gain Knowledge about Immunology, Toxicology & public health
- They will be able to solve Statistics and acquire knowledge from the different aspects of Bioinformatics.
- They will obtain the basic concept from molecular biology.
- They will develop their concept about Entrepreneurship.
- They will learn ideas about Nutrition, Health(women), Fitness, etc.

## NUTHGE

### Outcomes:

- Students will learn about definition of terms-Nutrition, Malnutrition and Health. Brief history of nutrition science. Scope of Nutrition.. Body Composition and Changes through the life cycle. Minimum Nutritional Requirement and RDA. Reference Man and Reference Woman. Energy in Human Nutrition : Idea of Energy and its unit, Energy Balance, Assessment of Energy Requirements of the body, B.M.R & influencing factors, S.D.A, Calorific value of food, Determination of Energy in food. Food groups. Function of nutrients- Carbohydrate, dietary fibre, protein, fat, vitamins, minerals, anti-oxidants, water. Effect of cooking and heat processing on the nutritive value of foods.
- Students will know about Cereals and Millets: Cereal products, breakfast cereals, fast foods. Structure, processing, storage, use in various preparations, variety, selection and cost. , Pulses and Legumes: Production (in brief), structures, selection and variety. Storage, processing and use in different preparations. Nutritional aspects and cost, Milk and Milk-products: Composition, classification, selection quality and cost, processing, storage and uses in different preparations. Nutritional aspects, shelf - life and spoilage, Eggs: Production, grade, quality, selection, storage and spoilage, cost, nutritional aspects and use in different preparations, Meat, Fish and Poultry: Types, selection, purchase, storage, uses, cost, spoilage of fish poultry and meat, uses and preparations, Vegetables and Fruits: Types, selection, purchase, storage, availability. Cost of use and nutritional aspects of raw & processed products and use in different preparations, Sugar and Sugar products: Types of natural sweeteners, manufacture, selection, storage and use as preserver, stages in sugar cookery. , Fats and Oils: Types and sources (animal and vegetable), processing, uses in different preparations, storage, cost and nutritional aspects. , Raising and Leavening agents: Types, Constituents, Uses in cookery and bakery, Storage. , Food Adjuncts: Spices, Condiments, Herbs, Extracts, Concentrates, Essences, Food Colours. Origin, classification, Description, uses, Specifications, procurements and Storage. , Convenience Foods: Role, types, advantages, uses, cost and contribution to diet., Salt : Types and uses. Beverages : Tea; Coffee. Chocolate and Cocoa Powder-Processing, cost and nutritional aspects, other beverages-Aerated beverages, juices. Preserved Products : Jams, Jellies, Pickles, Squashes, Syrups types, composition and manufacture, selection, cost, storage, uses and nutritional aspects. Food Standards : ISI, Agmark, FPO, MPO, PFA. 16. New food: fast food, junk food, GM food, Free food Food, preservation, food processing, food adulteration and food storage.

- Student have clear concept about of community, types of community, factors affecting health of Community. 2. Basic concept of Nutritional Programme Formulation. 3. ICDS Programme – Aims, Objectives, Target group, Services provided, Advantages, Limitation, Suggestion for improvement. 4. MDMP – Aims, Objectives, Target group, Service provided, Advantages, Limitation, Suggestion for improvement. 5. ANP, SNP, CNP, BFP – Aims and Objectives, Target group, Service provided, Advantages, Limitation. 6. PHC and Public distribution system to combat malnutrition 7. Identifying signs and symptoms of vitamin A deficiency, Vit.-D deficiency, iodine and iron deficiency, and role of prophylaxis programme to overcome such deficiencies. 8. Nutritional Anthropometry, Biochemical tests and Biophysical methodology - Merits, Limitations 9. Diet Survey: Need and importance, methods of dietary survey- Merits and Limitations. Family food security. 10. Concept of Surveillance Systems: Role of international, national, regional agencies and organizations. 11. Nutritional problem in the community : Epidemiology, etiology and prevention of Marasmus, Kwashiorkor, Scurvy, Ricket, Osteomalacia, Obesity. 12. Importance of dietitian in community Nutrition in specific pathophysiological conditions: 1. Hospital diets- liquid, clear fluid, soft & normal diets. 2. Diet therapy in diabetes mellitus and obesity. 3. Dietary management and nutritional factors involved in cardiovascular disease like atherosclerosis, hyperlipidemia, hypertension. 4. Diet therapy in peptic ulcer, gastritis, diarrhea, colitis, constipation, flatulence and jaundice. 5. Diet during febrile condition, infection, surgical condition, nephritis, and nutritional anemia. 6. Therapeutic uses of dietary fibers with special reference to chronic constipation, diverticular disease, irritable bone syndrome, obesity and diabetes, possible adverse effects of dietary fibers. 7. Rehydration therapy- Elementary idea about rehydration, Conditions for rehydration. Different types of rehydration therapy with special emphasis on ORS -its types and importance, Age dependent ORS quantity for rehydration therapy. 8. Nutrition and Infection: Infection, a cause of malnutrition and vice-versa. Nutrition and immunity during childhood and in adult.
- . Students will know about Introduction to meal management - balanced diet, food groups & the planning of balance diet. 2. Food guides for selecting adequate diet . 3. Diet therapy 4. Diet & stress in current scenario. 5. Meal planning for the family. 6. Indian meal patterns - vegetarian & non-vegetarian. 7. Food faddism & the faulty food habits. 8. Nutritive value of common Indian recipes. 9. Nutrition in pregnancy - Physiological stages of pregnancy, nutritional requirements. Food selection, complication of pregnancy. 10. Nutrition during lactation - Physiology of lactation, nutritional requirements. 11. Nutrition during infancy - growth & development, nutritional requirements, breast feeding, infant formula, introduction of supplementary foods. 12. Nutrition during early childhood (Toddler/Preschool)- Growth & nutrient need, nutrition related problems, feeding patterns. 13. Nutrition of school children- Nutritional requirement, importance of snacks, school lunch. 14.

Nutrition during adolescence - Growth & nutrient needs, food choices, eating habits, factor influencing needs. 15. Nutrition during adulthood - Nutritional requirements, feeding pattern. 16. Geriatric nutrition: Factors affecting food intake and nutrient use, nutrient needs, nutrition related problems.

