

Part A

Faculty: Interdisciplinary Studies

Programme: MSc (Home Science) Food Science and Nutrition

• **Programme Outcomes:**

1. Develop interdisciplinary and intra disciplinary skills which enable students for knowledge acquisition
2. Enable to pursue higher education and research
3. Facilitate students for betterment of individual and community through health and nutrition promotion
4. Provide scope to develop self-dependency among the desirous students to set up their own enterprise in the field of food and nutrition
5. Make students competent to work at local, regional, national and international level

• **Programme Specific Outcomes:**

1. Acquire comprehensive and advanced knowledge in the field of Food Science and Nutrition
2. Develop capacity to explore opportunities in scientific research in the subject related areas
3. Understand the physiology, biochemical markers in disease conditions and plan diets considering the modified nutrient requirements
4. Facilitate analytical and technical skills in food formulations, nutrient estimations, food processing, and food preservation to work as skilled human resources in the food and health sectors
5. Boost the communication skills, presentation skills, oratory skills and technological skills among students
6. Perceive the role and responsibilities of dietitian and nutritionist in different healthcare organizations
7. Develop the necessary skills for diet planning and diet counselling for patients
8. Get acquainted with food processing and preservation techniques along with learning food safety and quality management issues
9. Provide scope for trainings and internships to get real exposure to work environment and professional abilities
10. Enable to explicitly formulating and analyzing value added and innovative products

• **Employability Potential of the Programme:**

A master's degree in Food Science and Nutrition entails studying a generalized version of the field as well as associated areas including community nutrition, food service management, human nutrition, food processing and preservation etc. Therefore, it offers many career alternatives to consider for e.g. working in food sector or health sector, become an academician, set up own clinic, working with agencies related to community welfare etc.

Acquiring post graduate degree in Food Science and Nutrition opens the door for the higher qualification PhD degree and research. The students can also avail fellowships and scholarships for research and pursuing higher education. Various employment opportunities are available in the field of research as a Project fellow, project assistant, research associate, scientific officer, technical assistant, project trainees in the government funded projects or sponsored projects by various agencies or in research institutions or in the universities.

Post graduate degree is a prerequisite for the adoption of academic jobs in the colleges and Universities. Students are eligible to appear for the National Eligibility Test (NET) and State Level Eligibility Test (SLET) for teaching profession in higher education institutes which offer post graduate degree, graduate degree, diploma and certificate courses in Food Science and Nutrition.

Students of Food Science and Nutrition can opt for a very lucrative career as a dietitian or diet/nutrition consultants by offering their expertise in the government hospitals, private hospitals, clinics, nursing homes, where they can plan diet for the patients, manage dietetic departments and counsel patients. Their primary responsibility is to help people regarding the proper nutritional care and adopt wholesome eating practices. By raising awareness about diet and nutrition as well as promoting healthy eating practices for the prevention or treatment of particular diseases, the profession works for the better health of the people.

In health clubs, wellness clinics and in fitness centers, students can work as a diet counselor, wellness coach, lifestyle expert, and trainers. People now a day are health conscious and to lead a healthy lifestyle, they prefer an expert advice. Students have tremendous opportunities in this sector and can also work as a freelancer and can set up their own nutrition clinic or diet clinic and give diet prescription.

In this technological era, many ventures are offering online diet and nutrition consultation through specifically designed applications (Apps) and software. Various companies provide job opportunities to dietitians and nutritionists for online consultation. Students have scope to develop their own diet and nutrition based fitness programs and can launch their own application (Apps) and software as a Startup. Students of Food Science and nutrition well versed with the oratory and presentation skills can opt for use of social media platforms like YouTube and Facebook and can be a content creator. Students have good opportunity as a writer to produce books, articles, promos, and television programmes on the best nutritional practices on television, radio, magazines and newspapers. Also, they can choose to become a food blogger and explore many new things.

Institutions for old age people, residential institutions for students like hostels, schools and corporate kitchens, industrial kitchen, rehabilitation centers and hotels offers professional opportunities for students as a nutrition expert and advise various target groups about the healthy eating habits and proper nutrition.

Students have an opportunity to be a part of the team in the development of the production procedures and recipes for food and drink items as well as work as food technologists to guarantee that food products are safe and adhere to strict requirements. Many private and public agencies hire food safety inspectors to make sure that laws governing food safety and food processing are being followed. Also, the restaurants and other food service establishments must be inspected by state health officials for food safety so students can take up career as food safety officer.

Students may decide to pursue a career as a culinary expert and work in the various food industries, food service establishments or education/communication where they can develop nutritional recipes, plan nutritious menus or organize cooking shows. In various establishments having large scale kitchens, students can work as production managers to make sure goods and services are produced safely, cost-effectively and on time and meet the required quality standards.

Students can pursue a career as a public health nutritionist, which will allow them to play a significant part in the creation of various nutrition interventions to address nutritional concerns on a wide scale and play a crucial role in the growth and development of the vulnerable groups, such as children and women in the reproductive age group.

Students who successfully complete the Food Science and Nutrition programme may work for national and international agencies such as UNICEF (United Nations Children's Fund), Save the Children, United Nations Development Programme, World Food Programme etc. Students have career in government sector in the Department of Women and Child Development as ICDS project officers, superintendent and probationary officers, can be a part of nutrition surveillance programmes as Project workers for carrying out surveys and facilitators for nutrition education programmes. There is an opportunity to join Krishi Vigyan Kendra as a Subject Matter Specialist and work at grass root level for nutritional as well as financial upliftment and empowerment of rural women.

There is a tremendous scope for self-employment for the students after completing the course in Food Science and Nutrition. They can set up home industry for Processed products, value added food products, nutrient enriched mixes, therapeutic food products and recipes for various nutritional disorders and diseases. They can set up their own catering unit to serve ready to eat foods, packed meals, packed lunches for schools, canteens, hospitals and other institutions. Students can also make careers as skill trainers in cookery, bakery and home scale preservation.

To sum up, students opting for the post graduate degree in Food Science and Nutrition have many different kinds of career opportunities as listed ó

- Pursuing Higher degree (Ph.D)
- Research
- Academician
- Dietitian
- Nutritionist
- Freelance diet consultants
- Wellness coach
- Lifestyle experts
- Content creator in Food and Nutrition
- Food bloggers
- Nutrition experts in various institutions
- Food safety inspectors
- Culinary experts
- Food product developer
- Public health nutritionists
- ICDS and Government Schemes
- Subject matter specialist in KVK
- Skill trainers in cookery, bakery and home scale preservation
- Self-employment

Part B

Syllabus Prescribed for 2022-2023 First Year PG Programme

Programme: MSc (Home Science) Food Science and Nutrition

Semester 1

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
FSN101	Food Science (Tr)	60

• **Course Outcomes:**

After completion of the course students would be able to-

1. Use the theoretical knowledge in various application and food preparations
2. Apply the knowledge of cooking methods and evaluation of food
3. Identify the chemical reactions and physical changes which occurs during the processing, storage, and handling of foods and their application
4. Grade the raw and processed food product
5. Describe the mechanism of browning of food

Unit	Content
Unit I	<ul style="list-style-type: none"> • Basic concept and definitions of food science • Food dispersions <ul style="list-style-type: none"> - Types of food dispersion sol, gel, emulsion and foam - Colloidal systems • Cooking ó Preliminary preparation, Dry heat and moist heat cooking methods <ul style="list-style-type: none"> - Microwave cooking, Ohmic cooking, Induction cooking, Solar cooking - Merits and demerits of different cooking methods • Evaluation of food quality <ul style="list-style-type: none"> - Sensory evaluation- Standardization of recipes, sensory attributes, different tests for sensory evaluation, score card - Objective evaluation <p style="text-align: right;">(12 Periods)</p>
Unit II	<ul style="list-style-type: none"> • Cereal, Millets and their Products <ul style="list-style-type: none"> - Structure, composition and nutritive value of cereals and millets - Gluten formation, Gelatinization, Dextrinization - Flour Mixtures ó Batters and Doughs - Fermented and unfermented cereal products - Leavening agents ó types - Role of cereals and millets in cookery • Sugars <ul style="list-style-type: none"> - Different forms of sugars - Stages of sugar cookery - Factors affecting crystallization, crystallized and non- crystallized candies - Role of sugar in cookery <p style="text-align: right;">(12 Periods)</p>
Unit III	<ul style="list-style-type: none"> • Pulses, Nuts and Oil seeds <ul style="list-style-type: none"> - Composition and nutritive value, toxic constituents present and processing - Soaking, germination and fermentation of pulses - Role of pulses, nuts and oilseeds in cookery • Egg, Meat, Fish and Poultry <ul style="list-style-type: none"> - Structure, composition, nutritive value, preservation and storage - Quality of egg and role of egg in cookery - Aging, tenderizing, and curing of meat - Post mortem changes in meat, changes of meat during cooking - Different methods of cooking egg, meat, fish and poultry - Role of meat, fish and poultry in cooking <p style="text-align: right;">(12 Periods)</p>
Unit IV	<ul style="list-style-type: none"> • Fats and oils <ul style="list-style-type: none"> - Composition, nutritional importance, processing and refining of fats - Hydrogenation, smoking point, Rancidity and storage of fats - Role of fat in cookery • Milk and milk products <ul style="list-style-type: none"> - Composition and nutritive value - Types of milk and milk products, effect of heat on milk - Processing of milk - Homogenization, Evaporation, Drying and fermentation - Pasteurization of milk, Cheese making - Role of milk in cookery <p style="text-align: right;">(12 Periods)</p>

Unit V	<ul style="list-style-type: none"> • Vegetables and Fruits <ul style="list-style-type: none"> - Classification, composition, nutritive value, selection and storage - Pigments present in vegetables and fruits - Effect of different cooking methods, acid and alkali on pigments - Enzymatic and non- enzymatic browning • Beverages <ul style="list-style-type: none"> - Classification, Alcoholic beverages, carbonated and non-carbonated beverages - Composition and phenolic compounds in beverages -coffee and tea • Spices and Condiments <ul style="list-style-type: none"> - Active components present, use of spices and condiments in Indian cookery <p style="text-align: right;">(12 Periods)</p>
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Syllabus Prescribed for 2022-2023 First Year PG Programme

Semester I

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
FSN102	Clinical Nutrition and Dietetics- I (Tr)	60

- **Course Outcomes:**

After completion of the course students would be able to-

1. Interpret the role and responsibilities of dietitians
2. Perceive the principles of diet therapy and modification of normal diet for therapeutic purpose
3. Comprehend the nutrition assessment and nutrition care process
4. Correlate the physiological conditions with the altered dietary requirements
5. Describe foods allowed and restricted in different disease conditions

Unit	Content
I	<ul style="list-style-type: none"> • Definitions and concepts of Food, Nutrition, Therapeutic nutrition, Dietetics • Dietitian's Qualifications, types of dietitians, Role and responsibilities of dietitian in hospital and community • Diets of Balanced diet, basic and therapeutic diets • Nutritional screening and assessment of nutritional status of hospitalized and outdoor patients <p style="text-align: right;">(12 Periods)</p>
II	<ul style="list-style-type: none"> • Medical Nutrition Therapy for fevers, infections and trauma conditions Etiology, signs and symptoms, complications, Nutritional care and medical management for - Fevers - Acute and Chronic; Typhoid, Tuberculosis - Infections of HIV/AIDS, SARS-CoV-2 - Preoperative and post-operative diets - Diet for trauma care and Burns <p style="text-align: right;">(12 Periods)</p>
III	<ul style="list-style-type: none"> • Medical Nutrition Therapy for Upper Gastro Intestinal Tract Disorders Etiology, signs and symptoms, complications, Nutritional care and medical management for upper gastro intestinal tract disorders - Disorders of Oesophagus of Oesophagitis, Hiatal Hernia - Disorders of Stomach of Indigestion/Dyspepsia, Gastritis, Peptic Ulcer and Duodenal Ulcer, Dumping Syndrome <p style="text-align: right;">(12 Periods)</p>
IV	<ul style="list-style-type: none"> • Medical Nutrition Therapy for Lower Gastro Intestinal Tract Disorders Etiology, signs and symptoms, complications, Nutritional care and medical management for lower gastro intestinal tract disorders - Disorders of Small Intestine and Colon - Intestinal Gas and Flatulence, Constipation, Diarrhoea, Steatorrhoea, Celiac Disease, Irritable Bowel Syndrome, Diverticular Disease - Inflammatory Bowel Disease: Ulcerative Colitis, Crohn's Disease <p style="text-align: right;">(12 Periods)</p>
V	<ul style="list-style-type: none"> • Nutritional Anemia and Neurologic Disorders - Etiology, classification, signs and symptoms, complications, nutritional care and Medical Nutrition Therapy • Nutrition for oral and dental health, Allergies and Migraine <p style="text-align: right;">(12 Periods)</p>

References:

1. Antia F.P. and Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford Publishing Company.
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Syllabus Prescribed for First Year PG Programme
Programme: M.Sc (Home Science) Food Science and Nutrition
Semester 1

Code of the Course/Subject	Title of the Course/Subject	Total Number of Periods
FSN103	Advance Nutrition (Tr)	60

Course Outcomes:

After completion of the course students would be able to:

1. Explain the human nutritional and energy requirements and basis for recommendations of nutrients
2. Describe the nutritional significance of macro and micronutrients and changing trends in dietary intake
3. Define the role of nutrition in special conditions
4. Discover the sources and bioavailability of macro and micronutrients
5. Apply the knowledge of food components other than essential nutrients

Unit	Content	Periods
Unit I	<ul style="list-style-type: none"> • Nutrition and Human Nutritional Requirements <ul style="list-style-type: none"> - Basic concepts and History of Nutrition - Human Nutritional Requirements - Methods determining human nutrient needs - Description of basic terms and concepts in relation to human nutritional requirements, guidelines and recommendations • Body Composition <ul style="list-style-type: none"> - Significance of body Composition, Methods of assessment and factors affecting body composition • Water <ul style="list-style-type: none"> - Functions of water in the body - Water distribution and compartments of body water, Water balance - Requirements of water and disturbances in fluid balance 	12
Unit II	<ul style="list-style-type: none"> • Human Energy Requirements <ul style="list-style-type: none"> - Components of energy requirement- factors affecting energy expenditure and requirement. - Methods of estimation of energy expenditure and requirement • Carbohydrates <ul style="list-style-type: none"> - Classification, Food sources and functions - Digestion, absorption, storage and utilization - Regulation of blood glucose - Dietary fiber, Resistant Starch, Glycemic Index of foods 	12
Unit III	<ul style="list-style-type: none"> • Proteins and Amino acids <ul style="list-style-type: none"> - Classification, Food sources, Functions, Digestion and absorption - Essential and non-essential amino acids - Evaluation of protein quality - Lipoproteins • Fats and fatty acids <ul style="list-style-type: none"> - Classification, Food sources and functions - Digestion, absorption, storage and utilization - Nutritional significance of fatty acids-SFA, MUFA, PUFA - Trans fats 	12
Unit IV	<ul style="list-style-type: none"> • Vitamins <ul style="list-style-type: none"> Functions, storage, bioavailability, sources, deficiency, toxicity and Recommended Dietary Allowances - Water soluble vitamins - B complex and C Vitamin - Fat soluble Vitamins A, D, E and K • Minerals <ul style="list-style-type: none"> Functions, storage, bioavailability, sources, deficiency, toxicity and Recommended Dietary Allowance - Macro minerals - Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chloride - Micro minerals - Iron, Copper, Manganese, Iodine, Fluoride, Zinc, Selenium, Chromium, Molybdenum 	12
Unit V	<ul style="list-style-type: none"> • Food Components other than essential nutrients <ul style="list-style-type: none"> - Prebiotics and probiotics - Polyphenols - Phytoestrogens - Anti-nutritional factors • Nutrition in Special Conditions <ul style="list-style-type: none"> - Emergencies and extreme environments • Nutritional Regulation of Gene Expression <ul style="list-style-type: none"> - Role of specific macro and micronutrients in controlling gene expression 	12

References:

1. Conn, E.E., Stumpe, P.K. Bruening G. and Doi, R. H. (2001): 5th Ed. Outlines of Biochemistry, John Wiley and Sons.
2. Devlin, T. M. (1947): 4th Ed. Text book of Biochemistry with Clinical Correlations, Wiley Liss Inc.
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Syllabus Prescribed for 2022-2023 First Year PG Programme
Programme: M.Sc (Home Science) Food Science and Nutrition
Semester 1

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
	Applied Physiology (Tr)	60

Course Outcomes:

After completion of the course students would be able to:

- 1) Summarize the structure and functions of cell and tissue
- 2) Interpret the alteration of structure and functions in various organs and systems in disease conditions
- 3) Get insight into role of enzyme and hormones in digestion and absorption
- 4) Explain the mechanism of regulation of various physiological conditions

Unit	Content	Periods
Unit I	<ul style="list-style-type: none"> • Cell and Tissue Structure and function of cell, structure organization of cell, organelle Cell membrane, transport across cell membrane and intracellular communication Formation of tissue, organ and system, elementary tissues in human body • Musculoskeletal system Types of muscle (Skeletal, smooth and cardiac muscles) their properties, characteristics, structure and function. Disorders of skeletal muscles 	12
Unit II	<ul style="list-style-type: none"> • Endocrine system Endocrine glands- structure, function, role of hormones, regulation of hormonal secretion, Disorders of endocrine glands • Nervous system Structure and function of brain, spinal cord, neuron, neurotransmitters Nerve impulse ó Afferent and Efferent nerves Hypothalamus and its role in various body functions obesity, sleep and memory 	12
Unit III	<ul style="list-style-type: none"> • Digestive system Introduction and function of digestive system Salivary gland and its secretion, stomach its section, pancreas, bile, small intestine, large intestine. The role of enzyme and hormones in digestion and absorption • Excretory system Structure and functions of kidney, Urine formation Role of kidney in maintaining pH of blood Water, electrolyte and acid base balance, Diuretics 	12
Unit IV	<ul style="list-style-type: none"> • Respiratory system Review of structure and function. Role of lungs in the exchange of gases Transport of oxygen and carbon dioxide Respiratory quotient, hypoxia and asthma • Circulatory system Structure and function of heart and blood vessel Regulation of cardiac output and blood pressure, heart failure, hypertension 	12
Unit V	<ul style="list-style-type: none"> • Blood Formulation, function and composition of blood Hematopoiesis, erythropoiesis and leukopoiesis Blood clotting, hemoglobin synthesis, Blood abnormalities • Immune system Natural immune system, cell mediated and humoral immunity, components of immune mechanism Activation of WBC and production of antibodies Disorders ó immune deficiency, hypersensitivity 	12

References:

1. Ganong, W.F. (1985): Review of Medical Physiology, 12 th Edition, Lange Medical Publication.
2. Moran Campell E. J., Dickinson, C.J., Slater, J.D., Edwards, C.R.W. and Sikora, K. (1984): Clinical Physiology, 5 th Edition, ELBS, Blackwell Scientific Publications.
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Programme: M.Sc (Home Science)
Food Science and Nutrition
Semester- I

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/hands-on/Activity)	(No .of Periods/Week)
FSN105	Food Science Practical	60

• **Course Outcomes:**

By the end of the Lab/Practical Course, generally students should be able to:

1. Standardize and evaluate the recipes
2. Define the use of cereal, millet and pulse flours in the cookery
3. Apply the knowledge of sugar cookery in the development of various recipes
4. Recognize the factors which affect colour, texture and flavour of vegetables and fruits
5. Prevent the undesirable changes in vegetables and fruits due to browning

***List of Practical/Laboratory Experiments/Activities etc.**

1	Standardization and sensory evaluation of recipes with ranking and rating tests using score card
2	Cereal cookery ó Gelatinization of starch, bread making, fermented and leavened cereal and millet products
3	Sugar cookery - Stages of sugar cookery, crystallization of sugar, crystalline and non-crystalline candies
4	Use of pulse flours in recipes and experiments with eggs to study the properties of coagulation, foaming, emulsifying agent and leavening agent
5	Fats and Oils ó Smoking temperatures ,factors affecting absorption of fat
6	Preparation and evaluation of recipes out of milk, meat and poultry
7	Factors affecting colour, texture and flavour of vegetables and fruits, browning reactions

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Programme: M.Sc (Home Science)Food Science and Nutrition
Semester1

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/hands-on/Activity)	(No. of Periods/Week)
FSN106	Clinical Nutrition and Dietetics – I Practical	60

• **Course Outcomes:**

By the end of the Lab/Practical Course, generally students would be able to:

1. Modify the regular diets
2. Apply the principles of nutrition and menu planning for therapeutic diets
3. Plan appropriate diets for patients with necessary dietary instructions
4. Prepare planned diets and evaluate

***List of Practical/Laboratory Experiments/Activities etc.**

1	Preparation of regular, clear liquid, full liquid, soft diets and mechanically altered diets
2	Planning and preparation of diets/recipes in fevers, infections and burns
3	Planning and preparation of diets in upper gastrointestinal tract diseases
4	Planning and preparation of diets in lower gastrointestinal tract diseases
5	Planning and preparation of diets in conditions of nutritional anemias, neurologic disorders, dental problems and allergies

Syllabus Prescribed for First Year PG Programme
Programme: Msc (Home Science) Food Science and Nutrition
Semester - I

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/hands-on/Activity)	(No. of Periods/Week)
FSN107	Advance Nutrition	30

Course Outcomes

1. **Interpret** the methods of assessment of energy expenditure to be applied in diet planning
2. Critically evaluate the dietary guidelines and recommendations
3. Identify the applications of glycemic index of foods
4. Illustrate the food sources of various nutrients

***List of Practical/Laboratory Experiments/Activities etc.**

1	Critical review of dietary allowances of micronutrients for all age groups
2	Critically evaluate national and international dietary guidelines.
3	Methods of estimation of protein quality
4	Qualitative analysis of macronutrients
5	Methods of calculating energy expenditure for assessing energy requirement
6	Enlisting high and low glycemic index rich foods.
7	Compilation different food sources of micronutrients in the form of learning materials

Part B
Syllabus Prescribed for First Year PG Programme
Programme: M.Sc (Home Science)Food Science and Nutrition
Semester - II

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
FSN201	Nutritional Biochemistry (Tr)	60

• **Course Outcomes:**

After completion of the course students would be able to-

1. Summarize the basic concepts of biochemistry
2. Explain the metabolism of carbohydrates, protein and lipids
3. Relate metabolism of different nutrients with dietary intake
4. Suggest preventive measures to overcome metabolic abnormalities

Unit	Content
Unit I	<ul style="list-style-type: none"> • Carbohydrate metabolism - Energy from dietary carbohydrate through Glycolysis, Tricarboxylic acid cycle - Utilization of glycogen. Gluconeogenesis. Significance of Pentosephosphate pathway and glucuronic acid pathway - Effect of starvation in Carbohydrate metabolism - Inborn errors of carbohydrate metabolism <p style="text-align: right;">(12 Periods)</p>
Unit II	<ul style="list-style-type: none"> • Protein and Aminoacid Metabolism - Urea Biosynthesis ó Transamination and Deamination, Nitrogen excretion and the urea cycle - Essential and non-essential aminoacids - Biosynthesis of the nutritionally non-essential amino acids - Effect of starvation in protein metabolism - Inborn errors of amino acid metabolism <p style="text-align: right;">(12 Periods)</p>
Unit III	<ul style="list-style-type: none"> • Lipid metabolism - Biosynthesis and oxidation of saturated and unsaturated fatty acids, glycerides, phospholipids and cholesterol, bioenergetics - Disorders of lipid metabolism, lipoproteins and their significance - Inborn errors of lipid metabolism <p style="text-align: right;">(12 Periods)</p>
Unit IV	<ul style="list-style-type: none"> • Vitamins - Review of chemistry of vitamins - Biochemical role of water soluble vitamins - Thiamin, Riboflavin, Niacin, Pyridoxine, Folate, Cyanocobalamin, Ascorbic acid - Biochemical role fat soluble vitamins - Vitamin A,D, E and K • Minerals - Review of chemistry of minerals - Biochemical role of macro minerals - Iron, Copper, Selenium, chromium, Manganese, Iodine, Fluorine. - Biochemical role of micro minerals - Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chloride <p style="text-align: right;">(12 Periods)</p>
Unit V	<ul style="list-style-type: none"> • Enzymes - Classification, properties and mechanism of action - Factors affecting enzyme activity- coenzymes and cofactors • Oxidative stress and Antioxidants - Free radicals ó Sources, types and formation in biological systems - Antioxidants ó Classification, types, sources and defense against free radicals - Role of free radicals and antioxidants in health and disease <p style="text-align: right;">(12 Periods)</p>

References:

1. Conn, E.E., Stumpt. P.K. Bruening G. and Doi, R. H. (2001): 5th Ed. Outlines of Biochemistry, John Wiley and Sons.
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6. Plummer, D. T., (1987): 3rd Ed., An Introduction to Practical Biochemistry, McGraw- Hill Publishing Co. Ltd.
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9. Winton, A.L., and Winton, K.B., (1999) Techniques of Food Analysis Allied Scientific Publishers.
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Syllabus Prescribed for 2022-2023 Year PG Programme
Semester-II

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
FSN202	Clinical Nutrition and Dietetics – II (Tr)	60

• **Course Outcomes:**

After completion of the course students will be able to:

1. Identify the metabolic conditions of the lifestyle related diseases
2. Relate the causes, symptoms and onset of various diseases
3. Assess the eating disorders and strategies to overcome
4. Make healthy food choices to avoid weight imbalances
5. Tell the dietary management of diabetes mellitus and diseases of liver, gall bladder and pancreas

Unit	Content
Unit I	<ul style="list-style-type: none"> • Nutritional Care in Weight Management - Obesity: Etiology, Classification, Energy balance, Metabolic aberrations & clinical manifestations, Consequences/risk factors, Dietary modifications, Lifestyle modifications, Pharmaceutical management, Surgical management, Preventive aspects - Underweight – Etiology, Metabolic aberrations & clinical manifestations, Dietary management - Nutrition in Eating Disorders – Anorexia Nervosa and Bulimia Nervosa <p style="text-align: right;">(12 Periods)</p>
Unit II	<ul style="list-style-type: none"> • Nutritional Therapy for Liver, Biliary System and Exocrine Pancreas Disorders Etiology, classification, risk factors, signs and symptoms, complications, Nutritional care and medical management for - Liver diseases: Hepatitis, Cirrhosis and Hepatic Coma - Gallbladder diseases - Cholelithiasis and Cholecystitis - Pancreatic Disorders - Acute and Chronic Pancreatitis <p style="text-align: right;">(12 Periods)</p>
Unit III	<p style="text-align: center;">Medical Nutrition Management of Metabolic disorder – Diabetes Mellitus</p> <p>Prevalence, Etiology, Symptoms, Types, Factors affecting normal blood glucose levels, Diagnostic and screening criteria for diabetes, Complications of diabetes - macro and micro-vascular, Management of Diabetes, medications and Lifestyle modification, Meal planning approaches - Food exchange list, Glycemic index of foods, Sweeteners and sugar substitutes</p> <ul style="list-style-type: none"> - Type 1 Gestational Diabetes Mellitus - Type 2 Gestational Diabetes Mellitus - Gestational Diabetes Mellitus <p style="text-align: right;">(12 Periods)</p>
Unit IV	<p style="text-align: center;">Nutrition and Cancer</p> <ul style="list-style-type: none"> - Development and Characteristics of cancer, Etiology, Metabolic alterations during cancer - Cancer cachexia, Energy metabolism, Other metabolic abnormalities, Sensory changes - Cancer therapy - Chemotherapy, Radiation therapy, Surgery - Nutritional considerations - Oral nutritional management, Enteral tube feeding, Total parenteral nutrition <p style="text-align: right;">(12 Periods)</p>
Unit V	<p>Medical Nutrition Therapy for Pulmonary Diseases</p> <p>Relationship between nutrition and pulmonary system</p> <p>Medical nutrition therapy in - Aspiration, Asthma, Chronic Obstructive Pulmonary Disease, Cystic Fibrosis, lung cancer, Pneumonia, Respiratory failure</p> <p style="text-align: right;">(12 Periods)</p>

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9. Sue Rodwell Williams, (1993): Nutrition, Diet Therapy, (7th Ed): W. B. Saunders Company London.
10. Wohl Shils and Goodheart: Modern Nutrition in Health and Disease, Mc Laren and Ubrman, Philadelphia.

**Syllabus Prescribed for 2022-2023 First Year PG Programme:
Programme: M.Sc (Home Science) Food Science and Nutrition
Semester - II**

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
FSN203	Community Nutrition (Tr)	60

Course Outcomes:

After completion of the course students would be able to-

1. Describe and discuss concept of health with individuals, target groups and community
2. Identify the causes, consequences and preventive strategies for nutritional problems in the community
3. Plan, implement and evaluate nutrition education programmes for identified target groups
4. Use effective communication methods for disseminating nutrition and health information among people
5. Know the various approaches to nutrition and health interventions programmes and policies

Unit	Content
Unit I	<ul style="list-style-type: none"> • Community Nutrition and Health - Concept of community, concept of nutrition and its relation to health - Definition and Concept of health, dimensions and determinants of health, Right to health, Indicators of health, concept of wellbeing - Responsibility of health ó Individual, community, state, international - Demographic profile and vital statistics <p style="text-align: right;">(12 Periods)</p>
Unit II	<ul style="list-style-type: none"> • Problems in Human Nutrition ó Low birth weight, Protein energy malnutrition, Vitamin A deficiency, Nutritional anemia, Iodine deficiency, Fluorosis, Lathyrism • Strategies to combat Nutritional Deficiencies- food fortification, food enrichment, vitamin A Prophylaxis Programme, prophylaxis against nutritional anemias, control of Iodine deficiency disorders <p style="text-align: right;">(12 Periods)</p>
Unit III	<ul style="list-style-type: none"> • Nutrition Education and Communication - Nutrition education ó Definition, meaning and importance, - Process of nutrition education ó Principles of Panning, implementation and evaluation, Methods of Nutrition education, Problems of Nutrition Education Programmes - Process of communication, types of communication, and methods in health communication <p style="text-align: right;">(12 Periods)</p>
Unit IV	<ul style="list-style-type: none"> • Natural and manmade disasters resulting in emergency situation- famine, draught food, earthquake cyclone, war and Political emergencies • Assessment and Surveillance of nutritional status in emergency affected Population • Indicators of malnutrition, Clinical Signs Screening acute malnutrition • Nutritional relief and Rehabilitation- - Assessment of food needs - Mass and Supplementary feeding - Local foods in rehabilitation. - Scarcity ratio <p style="text-align: right;">(12 Periods)</p>
Unit V	<ul style="list-style-type: none"> • Food Production, food and nutritional Security - Food Production, Post-harvest technology, food grain Storage - Food requirements various food availability, food and nutritional Security • Food Security and Food Security programmes - Public Distribution system (PDS) - Antyodaya Anna Yojana (AAY) - Annapurna Scheme - National food for work Programme <p style="text-align: right;">(12 Periods)</p>

References:

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Syllabus Prescribed for 2022-2023 First Year PG Programme

Semester II

Code of the Course/Subject	Title of the Course/Subject	(Total Number of Periods)
FSN204	Food Service Management (Tr)	60

• **Course Outcomes:**

After completion of the course students would be able to-

1. Apply the principles and functions of food service management
2. Comprehend about various types of food services
3. Realize the importance of sanitation and hygiene in food institutions
4. Recognize the importance and planning of available spaces for kitchen and storage
5. Evaluate the equipments used in food service establishments

Unit	Content
Unit I	<ul style="list-style-type: none"> • Food Service establishments- history and development, types of food service establishments -commercial and noncommercial • Food service management - Principles and functions, tools of management – Organization chart, job description, job specification, work/time schedule, job analysis • Approaches to food service management – Traditional approach, classical approach, scientific approach, management by objectives, system approach, quantitative approach, behavioral and human relations approach, contingency approach, just-in-time, total quality management approach <p style="text-align: right;">(12 Periods)</p>
Unit II	<ul style="list-style-type: none"> • Food management - Characteristics, types and quality of food, food purchasing, receiving and storage of food, menu planning, food production and processing, quantity cooking techniques • Food service - Style of service and types of service, environmental hygiene and sanitation, legal responsibilities of food service institutions, food standards <p style="text-align: right;">(12 Periods)</p>
Unit III	<ul style="list-style-type: none"> • kitchen space - types of kitchen, kitchen plan, work simplification in kitchen, designing and layout of kitchen • Storage space- types of storage, planning and layout of storage space, sanitation and safety, service area planning and decoration of service area • Equipments – Classification, factors affecting selection of equipments, purchase and installation, Care and maintenance of equipments <p style="text-align: right;">(12 Periods)</p>
Unit IV	<ul style="list-style-type: none"> • Personnel management- Definition, scope, concept of personnel management approaches of personnel management, personnel policies, staff employment, training, placement, promotion, personnel records, and work appraisals. • Financial management- definition Accounting, cost concept, components of cost, cost control, Pricing, book keeping and accounting <p style="text-align: right;">(12 Periods)</p>
Unit V	<ul style="list-style-type: none"> • Fuel - Types of fuel, advantages of fuel in relation to economy in quantity cookery, fuel saving economy input in service institutions • Hygiene sanitation and safety in food service institution - definition, importance, hygiene in food handling, control of spoilage, safety of leftover foods, disposal of food waste, HACCP and Good hygiene practices <p style="text-align: right;">(12 Periods)</p>

References:

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Syllabus Prescribed for First Year PG Programme
Programme: Msc (Home Science) Food Science and Nutrition
Semester II

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/hands-on/Activity)	(No. of Periods/Week)
FSN205	Nutritional Biochemistry	60

Course Outcomes

By the end of the Lab/Practical Course, generally students would be able to -

1. Illustrate the practical skills in handling the laboratory equipments
2. Develop an understanding of how to follow laboratory procedures safely and accurately
3. Demonstrate the analysis and calculate the selected nutrients in foods
4. Apply the techniques of Chromatographic separation of amino acids in food stuffs

***List of Practical/Laboratory Experiments/Activities etc.**

1	Introduction to Laboratory Equipments ó Digital weighing balance, pH meter, Photo Electric Colorimeter, Spectro photometer and other instruments exclusively used for food and nutrient analysis
2	Analysis of food- Total protein content Total fat content Total carbohydrate content
3	Determination of pH (in acids, alkalies and buffers using pH meter and indicators)
4	Quantitative determination of protein by Biuret Method
5	Estimation of Iron in foods
6	Estimation of calcium (titrimetric method/)
7	Estimation of ascorbic acid (titrimetric/colorimetric method)
8	Chromatographic separation of amino acids in food stuffs

Syllabus Prescribed for 2022-2023 First Year PG Programme
Programme: M.Sc (Home Science) Food Science and Nutrition
Semester- II

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/hands-on/Activity)	(No. of Periods/Week)
FSN206	Clinical Nutrition and Dietetics- II Practical	60

Course Outcomes

By the end of the Lab/Practical Course, generally students should be able to:

1. Describe basis for dietary management of metabolic diseases
2. Develop skills in calculations of nutritional requirements in the diseases
3. Plan and prepare diets based on modified nutritional requirements

***List of Practical/Laboratory Experiments/Activities etc.**

1	Planning and preparation of diets in obesity and underweight
2	Planning and preparation of diets in liver, gall bladder and diseases of exocrine pancreas
3	Planning and preparation of diets in diabetes mellitus ó Type 1 and Gestational Diabetes Mellitus
4	Planning and preparation of diets for Type 2 Diabetes Mellitus
5	Planning and preparation of diets for Pulmonary Diseases

**Syllabus Prescribed for 2022-2023 First Year PG Programme
 Programme: MSc (Home Science)Food Science and Nutrition
 Semester-II**

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/hands-on/Activity)	(No. of Periods/Week)
FSN207	Community Nutrition Practical	30

Course Outcomes:

By the end of the Lab/Practical Course, generally students would be able to:

1. Make aware individuals/groups/communities about right to health and responsibilities for health
2. Plan, implement and evaluate nutrition education programme for different target groups
3. Observe and evaluate ongoing public health nutrition programmes
4. Assess the benefits and problems in food security programmes

***List of Practical/Laboratory Experiments/Activities etc.**

1	Aware individuals/groups/communities about right to health and responsibilities for health and prepare report.
2	Plan, implement and evaluate nutrition education programme for different target groups
3	Preparing Messages, posters, leaflets, videos for nutrition promotion
4	Survey of at schools with ongoing mid day meal programme and survey of at Anganwadi Centre with ongoing ICDS programme with major focus to the quality of food provided
5	Critical review of food security programmes through contacting beneficiaries