



SNDT Women's University, Mumbai

**Undergraduate Degree / UG
Programme (Syllabus as Per NEP) -
Faculty of Science & Technology**

**Bachelor of Science
Home Science
(Food Science & Nutrition)**

B.Sc. In H.Sc. – FSN

As Per NEP – 2020

Semester – V & VI

**Syllabus
(W.E.F. Academic Year 2026-27)**

Terminologies

Vertical	Full-Form/Definition	Remarks	Related To Major And Minor Courses
Major (Core)	Subject Comprising Mandatory and Elective Courses, Major Specific IKS, Vocational Skill Courses, Internship/ Apprenticeship, Field Projects, Research Projects Connected to Major	Minimum 50% Of Total Credits Corresponding to Three/Four - Year UG Degree- Mandatory Courses	Related To The Major
Minor Course	Course From Same Or Different Faculty	Minimum 18-20 Credits to Be Completed in The First Three Years of UG Programme	Related To the Minor
OEC	Open Elective Courses/ Generic Courses	10-12 Credits to Be Offered in I And/Or II Year. Faculty-Wise Baskets of OEC To Be Prepared	OEC Is to Be Chosen Compulsorily from Faculty Other Than That of the Major
VSC	Vocational Skill Courses, Including Hands On Training Corresponding To The Major And/Or Minor Subject	8-10 Credits, To Be Offered in First Three Years, Wherever Applicable Vocational Courses Will Include Skills Based on Advanced Laboratory Practical's of Major	Related To the Major or Minor
SEC	Skill Enhancement Courses	06 Credits, To Be Offered in I And II Year, To Be Selected from The Basket of Skill Courses Approved by University	Related To the Major or Minor Any Relevant Skill
AEC	Ability Enhancement Courses	08 Credits, To Be Offered in I And II Year, English: 04 Credits to Be Earned in Sem - I, Modern Indian Language Of 04 Credits to Be Offered in II Year	NA
VEC	Value Education Courses	Understanding India, Environmental Science/Education, Digital	NA

		and Technological Solutions, Health & Wellness, Yoga Education, Sports, And Fitness	
IKS	Indian Knowledge System	Generic IKS Course: Basic Knowledge Of The IKS To Be Offered At First Year Level	Major-Specific IKS Courses: Advanced Information About the Major, Part of the Major Credit to Be Offered at Second- Or Third-Year Level
OJT	On-Job Training (Internship / Apprenticeship)	Corresponding To the Major Subject	Related To The Major
FP	Field Projects	Corresponding To the Major Subject	Related To the Major
CC	Co-Curricular Courses	Health And Wellness, Yoga Education Sports, And Fitness, Cultural Activities, NSS/NCC And Fine/ Applied/Visual/ Performing Arts	NA
CE	Community Engagement and Service		Related To Major
RP	Research Project	Corresponding To the Major Subject	Related To Major

Programme Template

Programme		B.Sc.
Specialization		Food Science & Nutrition
Faculty		Science & Technology
Preamble		This academic programme will enable the students to understand human physiology and human health, basics of nutrition and its relation to health. The learner is empowered to manage food related activities in terms of processing, preservation and product development keeping nutrients and nutritional requirement related aspects.
Programme Specific Outcomes (PSOs)		After completing this programme, Learner will -
	1.	Enlist nutrients and their functions.
	2.	Assess nutritional requirements for different age groups.
	3.	Undertake food processing, preservation and food product development.
	4.	Employ techniques of nutritional assessment.
	5.	Apply skills of food entrepreneurship and food sanitation and hygiene.
Eligibility Criteria for Programme		Any woman who has successfully cleared 10+2 in Home Science/Science subject from the recognized Boards by the Government of India/respective state with required credits as per the government norms to be able to join undergraduate programme.
Intake		30 (Batch size for Practical = 15 students)

Structure with Course Titles**B.Sc. In Home Science - Food Science & Nutrition****Semester – V**

Sr. No.	Course	Type of Course	Credits	Marks	Int Marks	Ext Marks
	Semester – V					
50130111	Nutritional Biochemistry (Th+Pr) (2+2)	Major (Core)	4	100	50	50
50130112	Food Science & Processing (Th+Pr) (2+2)	Major (Core)	4	100	50	50
51030111	Indian Culinary Heritage (Th)	IKS (Major Specific)	2	50	0	50
50230111	Medical Nutrition Therapy-I (Th+Pr) (2+2)	Major (Elective) (Any One)	4	100	50	50
50230112	Empathetic Nutrition (Th+Pr) (2+2)					
50330111	Recent Trends in Health & Nutrition (Th+Pr) (2+2)	Minor Stream	4	100	50	50
50630101	Food Analysis (Pr)	VSC-4	2	50	50	0
51330101	Nutrition Communication (Pr)	FP	2	50	50	0
			22	550	300	250

Semester – VI

Sr. No.	Course	Type of Course	Credits	Marks	Int Marks	Ext Marks
	Semester - VI					
60130111	Food Preservation (Th+Pr) (2+2)	Major (Core)	4	100	50	50
60130112	Public Health Nutrition for Mother and Child Care (Th+Pr) (2+2)	Major (Core)	4	100	50	50
60230111	Medical Nutrition Therapy-II (Th+Pr) (2+2)	Major (Elective) (Any One)	4	100	50	50
60230112	Food Product Development (Th+Pr) (2+2)					
60330121	Food Safety & Preservation (Pr)	Minor Stream	2	50	0	50
60330112	Food Safety & Preservation in Practice (Th)	Minor Stream	4	100	50	50
61230121	On The Job Training in Food Science & Nutrition (Pr)	OJT	4	100	50	50
			22	550	250	300

Exit with Degree (3-year)

Course Syllabus

Semester – V

.5.1 Major (Core)

Course Titles	Nutritional Biochemistry (Th+Pr)
Course Credits	4 Credit's (2 Th +2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Understand the fundamentals of metabolic processes occurring in the body and their significance.
	2. Understand the integration of these metabolic processes.
	3. Explain biochemical laboratory reports, including reference ranges, units used in biochemical tests, and factors affecting biochemical values.
	4. Interpret clinical laboratory reports by identifying normal and abnormal biochemical parameters and relating them to nutritional status and health conditions.
	5. Perform qualitative and quantitative estimations of normal and abnormal constituents in urine.
6. Evaluate biochemical test results using simulated clinical case studies to assess possible metabolic disorders and nutritional implications.	
Module 1 (Credit 1): Carbohydrate Metabolism and Biological Oxidation	
	1. Understand the various ways of carbohydrate utilization in the body.
	2. Create awareness of regulation of the pathways.
	3. Realize the significance of the pathways.
	4. Understand the process of energy yield from the organic substrates.
Content Outline	<ul style="list-style-type: none">• Biological Pathways<ul style="list-style-type: none">○ Overview of biological pathways including site, key steps, enzymes, coenzymes, regulation, physiological significance, and energetics.• Carbohydrate Metabolism<ul style="list-style-type: none">○ Glycolysis – pathway, key enzymes, regulation and energy yield.○ Tricarboxylic Acid Cycle (TCA / Krebs Cycle) – steps, enzymes and role in energy production.○ Pentose Phosphate Pathway – role in NADPH production and biosynthetic reactions.○ Gluconeogenesis – role in maintaining blood glucose during

	<p>fasting.</p> <ul style="list-style-type: none"> ○ Glycogenesis and Glycogenolysis – storage and mobilization of glycogen. ● Alcohol Metabolism <ul style="list-style-type: none"> ○ Metabolism of alcohol and biochemical alterations associated with excessive intake. ● Biological Oxidation <ul style="list-style-type: none"> ○ Electron Transport Chain and oxidative phosphorylation in ATP generation.
Module 2 (Credit 1): Protein and Lipid Metabolism	
	<ol style="list-style-type: none"> 1. Understand the various metabolic pathways 2. Significance, regulatory mechanisms and synthesis of various essential non nitrogenous compounds synthesized from amino acids. 3. To understand the various ways of utilization of lipids in the body. 4. Create awareness of regulation of the pathways. 5. Realize the significance of the pathways.
Content Outline	<ul style="list-style-type: none"> ● Amino Acid and Nitrogen Metabolism <ul style="list-style-type: none"> ○ Transamination – role of Vitamin B6 (pyridoxine) in amino acid metabolism. ○ Deamination – oxidative and non-oxidative. ○ Metabolic fate of ammonia – formation of glutamate and glutamine. ○ Urea Cycle ○ Metabolism of Nitrogenous Compounds ○ Metabolism of purines, pyrimidines and uric acid. ○ Gout – causes and metabolic significance. ○ Glutathione – synthesis and antioxidant role. ○ Creatine and Creatinine metabolism in muscle energy. ○ One-Carbon Metabolism and transmethylation reactions. ○ Metabolic fate of amino acids – glucogenic & ketogenic ● Lipid Metabolism <ul style="list-style-type: none"> ○ Lipogenesis and Lipolysis. ○ Fatty Acid Oxidation – oxidation of saturated, unsaturated and odd-chain fatty acids. ○ Fatty Acid Synthesis – elongation and desaturation.

	<ul style="list-style-type: none"> ○ Ketogenesis and ketosis ○ Lipoprotein and Cholesterol Metabolism ○ Triglyceride metabolism – intestinal resynthesis and hepatic synthesis. ○ Cholesterol Metabolism – sources, synthesis, functions and regulation. ○ Lipoproteins – metabolism of chylomicrons, VLDL, LDL and HDL in lipid transport.
Module 3 (Credit 1) Understanding Laboratory Reports of Biochemical Parameters (Practical)	
	<ol style="list-style-type: none"> 1. Read and understand clinical laboratory reports of patients. 2. Identify normal and abnormal biochemical parameters relevant to nutritional status. 3. Interpret biochemical findings in relation to clinical conditions and nutritional deficiencies.
Content Outline	<ul style="list-style-type: none"> • Structure of a biochemical laboratory report • Understanding reference ranges for various biochemical parameters • Units used in biochemical tests • Factors affecting biochemical value • interpretation of biochemical reports to understand Normal values, Abnormal values, Possible nutritional implications
Module 4 (Credit 1): Analysis of Simulated Case Studies for Metabolic Disorders (Practical)	
	<ol style="list-style-type: none"> 1. Perform qualitative and quantitative analysis of normal and abnormal constituents in urine, including urea and glucose, to assess and interpret metabolic conditions. 2. Estimate and interpret serum/blood constituents such as urea, uric acid, total protein, and cholesterol to evaluate and investigate metabolic disorders
Content Outline	<ul style="list-style-type: none"> • Qualitative Estimation of Normal Constituents of Urine. • Qualitative Estimation of Abnormal Constituents of Urine. • Quantitative Estimation in Urine. <ul style="list-style-type: none"> ○ Urea ○ Uric acid ○ Glucose • Quantitative estimation in serum / blood. <ul style="list-style-type: none"> ○ Urea

	<ul style="list-style-type: none"> ○ Uric acid ○ Total protein ○ Albumin ○ Cholesterol ● Interpretation of results with clinical case studies examples of Metabolic Disorders
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Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Assignments involving illustration and explanation of metabolic pathways and their integration in human metabolism.
- Reading and interpretation of medical laboratory reports to understand alterations in biochemical parameters and suggest appropriate nutritional interventions

References:

1. Rastogi S.C. "Biochemistry", 2nd Edition, (2003) Tata MacGraw Hill Publishing Co. Ltd.
2. Jain, J, L., S. Jain and N. Jain. "Fundamentals of Biochemistry". 6th Edition, (2005). S.Chand Company Ltd.
3. Plummer, D.T., "An Introduction to Practical Biochemistry". 2nd Edition, (1971) McGraw-Hill Publishing Co. Ltd.
4. Apps D.K. and Cohen B.B. and Steel C.M. "Biochemistry: A Concise Text for Medical Students" (1992), Bailliere Tindall
5. Debajyoti D, "Biochemistry" 2nd Edition, (1980) Academic Publishers
6. Satyanarayana U and Chakrapani U "Biochemistry", 3rd Edition, (2008), Books & Allied Publishers
7. Chatterjee M.N., Shinde R. "Textbook of Medical Biochemistry" 8th Edition (2012) Jaypee Brothers, Medical Publishers
8. Nelson DL & Cox MM. 5th Edition, 2009. "Lehninger's Principles of Biochemistry". Freeman and Co.
9. Berg J.M. Tymoczko J.L., and Stryer. L. "Biochemistry", 5th edition, (2002). W.H. Freeman
10. Vasudevan D.M. and Sreekumari S – (2007) "Textbook of Biochemistry for Medical Students". 5th Edition, Jaypee Brothers, Medical Publishers
11. "Murray Harper's Illustrated Biochemistry" 29th Edition, (2012) Prentice Hall Int.
12. Voet D, and Voet J.G "Biochemistry" 4th Edition. (2011), John Wiley
13. Oser, B. L. Ed "Hawk's Physiological Chemistry" (1979), 14th Rep. ed Tata McGraw-Hill Publishing Company Ltd.
14. H. Varley, A. H. Gowenlock, and M. Bell, "Practical Biochemistry, Vol. 1", London, UK, 5th Edition, (1976), Edited by: I. W. Heinemann
15. Godkar P.B. Godkar D.P Textbook of Medical Laboratory Technology (2006), 2nd Edition, Bhalani Publishing House
16. Burtis C.A, Ashwood E.R, Bruns D.E. (2007), "Tietz Fundamentals of Clinical Chemistry", 6th Edition, Elsevier Health Sciences
17. Davidsohn, I (Editor) & Henry, J B (Editor) "Todd-Sanford Clinical Diagnosis by Laboratory Methods" (1984), 17th Edition. W.B. Saunders

Semester – V

.5.2 Major (Core)

Course Titles	Food Science & Processing (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Explain the nature, structure and composition of foods.
	2. Understand the functional properties of food ingredients in food preparation.
	3. Describe the physical and chemical changes occurring during cooking and processing.
	4. Explain the basic principles of food processing and preservation.
	5. Identify processing techniques used for plant and animal foods.
Module 1 (Credit 1): Fundamentals of Food Science and Plant-Based Foods	
Learning Outcomes	1. Explain the basic concepts and importance of food processing.
	2. Describe the functional properties of water, beverages, fats and oils in foods.
	3. Explain the composition and cooking changes of plant foods such as cereals, pulses, fruits and vegetables.
Content Outline	<ul style="list-style-type: none"> • Introduction to Food Science and Processing <ul style="list-style-type: none"> ○ Definition and objectives of food processing. Importance of food processing in modern food systems • Water <ul style="list-style-type: none"> ○ Role of water in cookery, Forms of water – Bound and free water. ○ Types: Hard and Soft • Beverages <ul style="list-style-type: none"> ○ Types and Classification. Bottled water, Coffee, Tea, Cocoa Processing (Briefly) • Fats and Oils <ul style="list-style-type: none"> ○ Physical properties – plasticity, smoke point, flash point, Functional role of fats ○ Functional role of fats – flavor, texture, tenderness, emulsification, shortening and leavening effects. Emulsions ○ Fat Spoilage – rancidity, its types and its prevention. Antioxidants flavor reversion. ○ Fat absorption and factors affecting it. ○ Blending of oils, Fat substitutes – discuss specific products

	<p>available.</p> <ul style="list-style-type: none"> • Cereals <ul style="list-style-type: none"> ○ Structure and composition of cereal grain. Properties of starch: gelatinization, retrogradation, syneresis, dextrinization, Lump formation, Identity of grains. Gluten formation and factors affecting it. Processing of wheat and rice. Cereal products: breakfast cereals, macaroni/pasta products. • Pulses and legumes <ul style="list-style-type: none"> ○ Composition, toxic factors, its effects, and elimination. Effect of soaking, germination and fermentation. Processing of soybean products: soy flour, soy milk, tofu, tempeh, textured vegetable protein. • Vegetable and Fruits <ul style="list-style-type: none"> ○ Composition, color pigments and effect of cooking. Pectic substances and gel formation. Vegetable gums and their uses.
Module 2 (Credit 1): Animal-Based Foods and Their Processing	
Learning Outcomes	<ol style="list-style-type: none"> 1. Describe the composition of foods of animal origin. 2. Explain the changes occurring in animal foods during cooking and processing. 3. Understand the processing techniques used for milk, eggs, meat, fish and poultry products.
Content Outline	<ul style="list-style-type: none"> • Milk <ul style="list-style-type: none"> ○ Composition, effect of heat, acid, alkali and enzymes on milk, scum formation, maillard reaction. ○ Processing of milk: Various processed products of milk, cheddar cheese, paneer and ice cream. • Egg <ul style="list-style-type: none"> ○ Structure and composition of egg,protein in egg White and Egg Yolk, Methods to judge Egg quality (grading) Physical and chemical changes during egg storage, foams, role of egg in Cookery, methods of cooking egg. ○ Processing of Egg products, pasteurization, freezing desugaring & dehydration. • Meat, Fish and Poultry <ul style="list-style-type: none"> ○ Composition, Structure, post mortem changes, ripening or ageing of meat, tenderization of meat, changes during meat cooking. ○ Processing of Meat/ Fish /Poultry – Curing, Smoking, dehydration, etc. Sausages.

	<ul style="list-style-type: none"> • Fish <ul style="list-style-type: none"> ○ Classification, quality indicators of fish, types of fish spoilage, gelatin, and Fish Protein Concentrate (FPC).
Module 3 (Credit 1): Sensory Evaluation and Leavening Techniques (Practical)	
Learning Outcomes	1. Demonstrate sensory evaluation techniques for assessing food quality.
	2. Demonstrate the action of natural and chemical leavening agents in food products.
Content Outline	<ul style="list-style-type: none"> • Sensory Evaluation <ul style="list-style-type: none"> ○ Sensory characteristics of food, importance and objectives of Sensory evaluation and its Prerequisites. • Tests for Sensory Evaluation <ul style="list-style-type: none"> ○ Sensitivity Threshold test ○ Difference test – paired comparison, triangle and Duo-trio test. ○ Rating test – Hedonic, Numerical, Composite scoring and ranking test. • Leavening Agents <ul style="list-style-type: none"> ○ Preparation of baked products to demonstrate the action of natural and chemical leavening agents (yeast, baking powder and baking soda) and study their effect on volume, texture and quality of the product.
Module 4 (Credit 1): Food Science Principles and Processing Techniques (Practical)	
Learning Outcomes	1. Perform practical experiments demonstrating the functional role of ingredients in food preparation and processing.
Content Outline	<ul style="list-style-type: none"> • Sugar and Starch Cookery <ul style="list-style-type: none"> ○ Preparation of sugar syrups: one thread, two thread, soft ball, and crack stage. ○ Stiffness of starch gel and factors affecting it ○ Factors affecting gluten formation i.e. kneading time, types of cereal and flours, effect of amount of fat etc. • Fat Cookery <ul style="list-style-type: none"> ○ Shortening effect and factors affecting fat absorption. • Milk Cookery <ul style="list-style-type: none"> ○ Curd, Paneer, Maillard Reaction. • Egg Cookery <ul style="list-style-type: none"> ○ Role of Egg – Boiled, poached, Omelette, French toast,

	<p>mayonnaise etc.</p> <ul style="list-style-type: none"> • Preparation of one processed food product (e.g., jam, squash, cereal product or soy product, etc)
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Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Study of processing steps of a selected food product (e.g., bread, jam, cheese, breakfast cereals).
- Market survey of processed foods to identify ingredients, additives, and labeling information.
- Observation report on sensory evaluation of a food product using hedonic or ranking tests.

References:

1. Chakraborty, (1988). Post Harvest Technology of Cereals, Pulses and Oilseeds, (revised ed.), Oxford & IBH Publishing Co. Pvt Ltd,
2. Charley, H. (1982). Food Science, (2nd ed), John Wiley & Sons Publication.
3. Frazier W. C. and Westhoff, D. C. (2004). Food Microbiology, TMH, New Delhi
4. Girdharilal, S. G.S and Tandon, G.L. (1998). Preservation of fruits & Vegetables, ICAR, New Delhi.
5. Rao, I. S. (2013). Food Quality Evaluation (1st ed.)
6. Joshi S. A. (2000). Nutrition and Dietetics. (8th ed.) New Delhi: Tata McGraw Hill Publishing Co. Ltd.
7. Kent (2003). Technology of Cereal, (5th ed). Pergamon Press,
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9. Potter, N. M., (1996) Food Science, CBS Publication,
10. Ramaswamy, H. and Marcott, M. (2012), Food Processing Principles and Applications CRC Press,
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12. Srilakshmi, B. (2002). Nutrition Science. New Age International (P) Limited, New Delhi.
13. Swaminathan, M. (1987). Food Science, Chemistry and Experimental Foods, (2nd) ed

Semester – V

.5.3 Indian Knowledge System (IKS) (Major Specific)

Course Titles	Indian Culinary Heritage (Th)
Course Credits	2 Credit's
Course Outcomes	After going through the course, learners will be able to -
	1. Understand the historical evolution of Indian food traditions
	2. Explore regional diversity in Indian cuisine
	3. Learn about traditional ingredients, spices, and cooking methods
	4. Appreciate the cultural and social significance of food practices in India
5. Analyze the impact of globalization and modernization on Indian culinary heritage.	
Module 1 (Credit 1): Historical and Cultural Foundations of Indian Cuisine	
Learning Outcomes	1. Describe the historical influences that shaped Indian cuisine
	2. Identify major regional culinary traditions in India
	3. Recognize traditional ingredients and cooking methods
	4. Explain the cultural significance of food in festivals, rituals, and daily life
Content Outline	<ul style="list-style-type: none">• Concept of culinary heritage and food culture• Food traditions in ancient and medieval India• Influence of trade, migration, and colonial encounters on Indian cuisine• Role of spices and the global spice trade• Food in festivals, rituals, and social customs
Module 2 (Credit 1): Regional Culinary Traditions and Contemporary Relevance	
Learning Outcomes	Examine effect of Globalization and changing food habits
	1. Enable reservation of traditional food knowledge and sustainable food practices
Content Outline	<ul style="list-style-type: none">• Overview of regional cuisines of India (North, South, East, West, North-East)• Local ingredients, staple foods, and spice combinations• Traditional cooking methods (tandoor, dum, fermentation, pickling)• Street food culture and everyday food traditions• Culinary heritage preservation and sustainability• Role of Indian cuisine in tourism and globalization

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Documenting a family recipe and its cultural history
- Research on regional food traditions
- Study of traditional spice blends
- Documentation of festival foods
- Photo essay on local food markets

References:

1. Krish, A. (2020). Masala Lab: The Science of Indian Cooking. Penguin Publishers
2. Sen, C. T. (2015). Feasts and Fasts: A History of Food in India. Reaktion Books
3. Achaya, K. T. (2000). The Story of our Food. Universities Press (India) Private Ltd.
4. Nambiar, V (2021) 'Indian Food Anthropology and the Eat Right Movement' - Volume 2. 9.
5. Patil V (1992), 'Food Heritage of India: A collection of Unusual Recipes from every corner of India, pp:123-147, Vakil & sons ltd Bombay Print.

Semester – V

.5.4 A. Major (Elective)

Course Titles	Medical Nutrition Therapy – I (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Explain the etiology, pathophysiology, and clinical features of major metabolic, gastrointestinal,
	2. Analyze the role of nutrition and dietary principles in the prevention and management of various disease conditions.
	3. Apply dietary planning techniques, nutrient calculations, and therapeutic diet principles for the nutritional management of different clinical conditions.
	4. Design appropriate therapeutic diets and meal plans based on the specific nutritional requirements of individuals with various diseases.
Module 1 (Credit 1): Medical Nutrition Therapy for Metabolic & Lifestyle disorders	
Learning Outcomes	1. Explain the etiology and pathophysiology of metabolic and lifestyle disorders.
	2. Analyze the dietary principles and nutritional requirements involved in the management of metabolic and lifestyle disorders.
	3. Apply dietary planning techniques including carbohydrate counting, salt calculation, DASH diet, and Mediterranean diet for the nutritional management of these conditions.
	4. Design appropriate dietary modifications and meal plans for individuals with metabolic and lifestyle disorders.
Content Outline	<ul style="list-style-type: none"> • Etiology, Pathophysiology, Dietary considerations and modifications for: <ul style="list-style-type: none"> ○ Weight management (obesity, underweight) ○ Diabetes Mellitus (IDDM, NIDDM, Gestational DM) carbohydrate counting, ○ Cardiovascular Disease (Atherosclerosis, Coronary Heart Disease, Hypertension)- DASH Diet, Salt calculation, Mediterranean diet.
Module 2 (Credit1) Medical Nutrition Therapy For GI Disorders	
Learning Outcomes	1. Explain the etiology and pathophysiology of gastrointestinal disorders.
	2. Analyze the dietary considerations and nutritional requirements involved in the management of these gastrointestinal disorders.
	3. Apply dietary strategies such as elimination diets and the

	FODMAP eating plan in the nutritional management of gastrointestinal conditions.
	4. Design appropriate dietary modifications and meal plans for individuals with gastrointestinal disorders.
Content Outline	<ul style="list-style-type: none"> • Etiology, Pathophysiology, Dietary considerations and modifications for: <ul style="list-style-type: none"> ○ GERD ○ Gastritis & Peptic Ulcers – H.pylori infection ○ Celiac disease & Lactose intolerance ○ IBD (Crohn’s Disease, Ulcerative Colitis) IBS, FODMAPs Eating Plan
Module 3 (Credit 1): Therapeutic modifications for Metabolic & Lifestyle disorders (Practical)	
Learning Outcomes	1. Modify diets for Metabolic & Lifestyle disorders
	2. Apply nutritional principles for specific conditions
	3. Consider practical aspects of therapeutic meal planning
	4. Interpret biochemical reports
Content Outline	<ul style="list-style-type: none"> • Use clinical and biochemical indicators to plan dietary management for obesity and underweight. • Interpret biochemical parameters to provide medical nutrition therapy for IDDM, NIDDM, and Gestational Diabetes, including carbohydrate counting. • Evaluate clinical and biochemical markers to plan diets for atherosclerosis, coronary heart disease, and hypertension using approaches such as the DASH and Mediterranean diets with salt calculation.
Module 4 (Credit 1): Therapeutic modifications GI Disorders (Practical)	
Learning Outcomes	1. Modify diets for GI Disorders disorders
	2. Apply nutritional principles for specific conditions
	3. Consider practical aspects of therapeutic meal planning
	4. Interpret biochemical reports
Content Outline	<ul style="list-style-type: none"> • Interpretation of biochemical reports for planning Medical Nutrition Therapy (MNT) for <ul style="list-style-type: none"> ○ GERD ○ Gastritis & Peptic Ulcers – H.pylori infection ○ Celiac disease & Lactose intolerance • IBD (Crohn’s Disease, Ulcerative Colitis) IBS – use low FODMAPs Eating Plan

**Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)
(TH.):**

- Group Analysis of clinical case studies and recommendation of appropriate Medical Nutrition Therapy (MNT).
- Presentations on recent research papers and evidence-based guidelines for the management of various metabolic disorders.
- Group discussions and dietary recommendations for case studies involving multiple or overlapping clinical conditions.

References:

1. Mahan, L.K. and Escott-Stump, S. (2014): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
3. Escott-Stump, S. (1998): Nutrition and Diagnosis-Related Care, 4th Edition, Williams and Wilkins.
4. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
5. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.
6. Davis, J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd Edition, W.B. Saunders Co.
7. Walker, W.A. and Watkins, J.B. (Ed) (1985): Nutrition in Pediatrics, Boston, Little, Brown & Co.
8. Guyton, A.C. and Hall, J.E. (1999): Textbook of Medical Physiology, 9th Edition, W.B. Saunders Co.

Semester – V

.5.4 B. Major (Elective)

Course Titles	Empathetic Nutrition (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Explain the concept, principles, and significance of empathetic nutrition.
	2. Analyze the psychological, social, and cultural factors influencing eating behavior.
	3. Apply empathetic communication techniques in nutrition counseling situations.
	4. Design personalized and culturally appropriate nutrition interventions addressing the needs of diverse populations
	5. Assess the effectiveness of empathetic nutrition interventions using behavioral and patient-feedback indicators.
Module 1 (Credit 1): Foundations of Empathetic Nutrition	
Learning Outcomes	1. Define empathetic nutrition and its relevance in modern healthcare.
	2. Understand psychological and social determinants influencing dietary behavior.
	3. Recognize cultural and socioeconomic influences on food choices.
	4. Apply empathy-based communication in nutrition counseling.
Content Outline	<ul style="list-style-type: none"> • Introduction to Empathetic Nutrition: Concept and evolution of empathy in healthcare, Difference between traditional nutrition counseling and empathetic approaches, Role of empathy in patient adherence and health outcomes • Psychology of Eating Behavior: Emotional eating and stress-related eating, Relationship between food, mood, and mental health, Motivation and behavior change models • Socio-cultural Determinants of Nutrition: Socioeconomic status and food accessibility, Food insecurity and nutrition disparities, Environmental and community influences, Cultural food practices and beliefs • Nutrition Across Diverse Populations: Children and adolescents, Elderly populations, Chronic disease patients, Marginalized communities
Module 2 (Credit 1): Application of Empathetic Nutrition in Practice	
Learning Outcomes	1. Integrate empathy into clinical nutrition practice.
	2. Design personalized nutrition interventions.

	3. Address nutrition challenges in diverse populations.
	4. Evaluate ethical and professional considerations in counseling.
Content Outline	<ul style="list-style-type: none"> • Empathy in Nutrition Communication: Components of empathy in practice • Patient-Centered Nutrition Counseling: Building rapport with clients, Active and non-judgmental listening, Shared decision-making in diet planning • Ethical Considerations in Nutrition Counseling: Respecting autonomy and personal beliefs, Avoiding stigma and food shaming, Ethical communication • Evaluating Empathetic Practice: Measuring patient satisfaction, Behavioral change indicators, Long-term health outcomes
Module 3 (Credit 1): Empathetic Nutrition Assessment and Counseling (Practical)	
Learning Outcomes	1. Conduct patient-centered nutrition interviews using active listening and non-judgmental techniques.
	2. Identify emotional and stress-related eating patterns and relate them to mood and behavioral cues.
	3. Assess social and cultural factors affecting nutrition, including food accessibility and dietary practices.
	4. Build trust and rapport with clients using empathetic communication.
	5. Document, interpret, and report nutrition assessments ethically and sensitively.
Content Outline	<ul style="list-style-type: none"> • Contextualizing Case Histories Evaluate the influence of socioeconomic status, religion, and cultural practices on dietary behavior using mock or real data. • Case studies on emotional eating: Analyze triggers and design empathetic counseling strategies. • Different Forms of Empathy: Primary and Advanced Empathy, Summarizing, Paraphrasing and verbalizing reflections • Reflective journaling: Document learning from counseling sessions, communication techniques, and ethical considerations.
Module 4 (Credit 1): Personalized Nutrition Planning and Evaluation (Practical)	
Learning Outcomes	1. Design personalized nutrition plans for diverse populations (children, elderly, chronic disease patients, marginalized groups).
	2. Apply behavior change models and motivational strategies to support dietary adherence.
	3. Integrate ethical, inclusive, and culturally appropriate

	recommendations into interventions.
	4. Evaluate the effectiveness of counseling and nutrition education using feedback, behavior indicators, and reflective practice.
	5. Present nutrition interventions professionally, highlighting empathetic strategies used.
Content Outline	<ul style="list-style-type: none"> • Meal planning exercises: Develop culturally sensitive, nutritionally balanced meal plans for specific case studies. • Role-play counseling sessions: Practice active listening, empathy, and motivational interviewing with peer simulations. • Evaluation exercises: Use peer or standardized patient feedback to assess effectiveness and adherence potential. • Group presentations: Present intervention plans, ethical considerations, expected outcomes, and reflections on empathetic practice.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Assignments on documenting emotional eating, mindful eating, etc
- Role Play for Nutrition Counseling
- Case-based Learning Assignments

References:

1. Ainapure, A. (2024). Empathetic nutrition: Professional and ethical counselling for dietitians. Peach Blink Publishers
2. Bauer, K. D., & Liou, D. (2021). Nutrition counseling and education skill development (4th ed.). Cengage Learning India.
3. Joshi, S. A. (2021). Nutrition and dietetics with Indian case studies (5th ed.). McGraw Hill Education India.

Semester – V

.5.5 Minor Stream

Course Titles	Recent Trends in Health and Nutrition (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Explain emerging concepts in health and nutrition science.
	2. Evaluate the role of functional foods, superfoods, and dietary patterns in health promotion.
	3. Identify and analyze nutrition myths and misleading dietary claims.
	4. Access popular diet trends and their health implications.
Module 1 (Credit 1): Foundations and Emerging Concepts in Health and Nutrition	
Learning Outcomes	1. Students will be able to understand the scientific basis of modern nutrition trends and evaluate their relevance to health.
Content Outline	<ul style="list-style-type: none"> • Balanced Diet and Modern Dietary Concepts Concept and components of a balanced diet Role of macronutrients and micronutrients in health My Plate and other dietary guidelines • Superfoods and Functional Foods Concept and characteristics of superfoods- evaluation of superfood claims Functional foods and nutraceuticals Role of functional foods in health promotion and disease prevention • Cultural and Lifestyle Influences on Food Choices Cultural diversity in diets Traditional diets and health Influence of media, globalization and food marketing on dietary practices
Module 2 (Credit 1): Popular Diet Trends, Myths and Evidence-Based Nutrition	
Learning Outcomes	1. Students will be able to critically evaluate diet trends and identify myths related to nutrition and health.
Content Outline	<ul style="list-style-type: none"> • Nutrition Myths and Misconceptions Common myths related to food, immunity and weight management Sources of nutrition misinformation (social media, marketing, fad diets) Scientific approach to evaluating nutrition claims • Popular Dietary Trends Overview, principles, advantages and limitations of: Ketogenic Diet

	<p>Intermittent Fasting Mediterranean Diet Vegan and Plant-based Diets GM Diet and other fad diets</p> <ul style="list-style-type: none"> • Emerging Trends in Health and Nutrition Personalized nutrition Gut health and probiotics Sustainable diets and plant-based nutrition Nutrition for immunity and lifestyle disease prevention
Module 3 (Credit 1): Survey and Community Assessment of Nutrition Trends (Practical)	
Learning Outcomes	1. Students will develop skills in survey design, data collection, and assessment of nutrition trends in the community.
Content Outline	<ul style="list-style-type: none"> • Designing a Nutrition Survey Tool Preparation of questionnaire related to: Eating habits, Awareness of balanced diet, Knowledge about superfoods and functional foods • Community Survey Conduct a small-scale survey (10–15 respondents per student or group) on: Popular diet trends followed Awareness about healthy eating practices Sources of nutrition information (social media, doctors, influencers) • Based on the survey identify common food habits and nutritional gaps.
Module 4 (Credit 1): Field Study on Nutrition Trends and Awareness (Practical)	
Learning Outcomes	<ul style="list-style-type: none"> • Students will evaluate real-life dietary practices and understand the influence of nutrition trends on lifestyle.
Content Outline	<ul style="list-style-type: none"> • Field Visit Activity – Observation and Documentation Visit any one of the following establishments: Health food store, organic food market, or a fitness/diet counselling centre. • Observe and document: Types of popular health foods and products available Consumer preferences and purchasing patterns Nutritional or health claims associated with the foods and diet practices promoted • Case Study on Popular Diet Trends <ul style="list-style-type: none"> ○ Interview 1-2 individuals following diets such as: Keto diet, Intermittent fasting, Vegan diet, Weight-loss diets ○ Record the following observations: Motivation for diet, Dietary changes, Perceived health benefits

	<p>or challenges</p> <ul style="list-style-type: none"> • Nutrition Myth Documentation Collection of common nutrition myths from community members Verification using scientific nutrition guidelines • Preparation of a report based on the information collected & Group presentation
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Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Group projects and presentations on emerging dietary patterns and recent trends in nutrition and health.
- Development of nutrition education materials aimed at debunking common myths and misconceptions related to food and dietary practices.

References:

1. World Health Organization. (2023). Healthy diet. <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
2. Food and Agriculture Organization. (2022). Sustainable healthy diets: Guiding principles. <https://www.fao.org>
3. Indian Council of Medical Research & National Institute of Nutrition. (2020). Dietary guidelines for Indians. <https://www.nin.res.in>
4. National Institute of Nutrition. (2020). Dietary guidelines for Indians: A manual. <https://www.nin.res.in>
5. Academy of Nutrition and Dietetics. (2023). Food and nutrition information. <https://www.eatright.org>

Semester – V

.5.6 Vocational Skill Courses (VSC-4)

Course Titles	Food Analysis (Pr)
Course Credits	2 Credit's
Course Outcomes	After going through the course, learners will be able to -
	1. Demonstrate basic laboratory skills used in food analysis.
	2. Understand principles of analytical methods used for food components.
	3. Perform simple quantitative estimations of selected nutrients in foods.
	4. Detect common adulterants in frequently consumed foods.
	5. Interpret analytical results in relation to food quality and safety standards.
Module 1 (Credit 1): Fundamentals of Food Analysis and Detection of Food Adulterants (Practical)	
Learning Outcomes	1. Understand the significance of food analysis.
	2. Gain knowledge of sampling techniques used in food analysis.
	3. Understand the working principles of common laboratory instruments.
	4. Identify common adulterants present in foods.
Content Outline	<ul style="list-style-type: none"> • Introduction to Food Analysis Importance of food analysis Sampling in food analysis Sampling methods and techniques Advantages and limitations of sampling methods • Laboratory Instruments Used in Food Analysis Working principle and uses of: Colorimeter Spectrophotometer Centrifuge Analytical balances Muffle furnace Water bath Glass distillery unit • Detection of Food Adulterants Qualitative analysis of adulterants in: Fats and oils Spices and condiments Milk and milk products Cereals and pulses Honey and jaggery Tea and coffee

	Sweets and confectionery
Module 2 (Credit 1): Proximate Analysis and Estimation of Food Components (Practical)	
Learning Outcomes	1. Understand analytical methods used for estimation of proximate principles.
	2. Perform titrimetric and colorimetric methods used in food analysis.
	3. Interpret results obtained from estimation of food components.
Content Outline	<p>Proximate Analysis</p> <p>Estimation of moisture by AOAC method of dehydration Estimation of crude fat by solvent extraction method (Demonstration) Estimation of total ash by AOAC method Estimation of protein by Macro-Kjeldahl method (Demonstration)</p> <p>Chemical Constants of Fats and Oils</p> <p>Determination of Acid Value (NIN Method) Determination of Saponification Value (NIN Method) Determination of Iodine Value (NIN Method)</p> <p>Estimation of Food Components</p> <p>Estimation of total and free sugar in honey by Benedict's / Lane and Eynon method Determination of ascorbic acid (Vitamin C) using 2,6-dichlorophenol indophenol method Estimation of sodium chloride in butter by Mohr's titrimetric method Estimation of calcium by titrimetric method (Clark and Collip) Estimation of phosphorus by Vanadate-Molybdate / Fiske and Subbarao method Estimation of iron by dipyriddyil reagent method Estimation of acidity in milk by titrimetric method</p>

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Survey of Commonly Adulterated Foods – Students will identify commonly adulterated food products available in the market (such as milk, spices, edible oils, honey, tea, etc.) and prepare a brief report describing the possible adulterants and simple methods used for their detection.

References:

1. Chakraborty, (1988). Post Harvest Technology of Cereals, Pulses and Oilseeds, (revised ed)., Oxford & IBH Publishing Co. Pvt Ltd,
2. Charley, H. (1982). Food Science, (2nd ed), John Wiley & Sons Publication.
3. Frazier W. C. and Westhoff, D. C. (2004). Food Microbiology, TMH, New Delhi

4. Girdharilal, S. G.S and Tandon, G.L. (1998). Preservation of fruits & Vegetables, ICAR, New Delhi.
5. Rao, I. S. (2013). Food Quality Evaluation (1st ed.)
6. Joshi S. A. (2000). Nutrition and Dietetics. (8th ed.) New Delhi: Tata McGraw Hill Publishing Co. Ltd.
7. Kent (2003). Technology of Cereal, (5th ed). Pergamon Press
8. Manay, S. & Shadaksharaswami, M. (2004) Foods: Facts and Principles, New Age Publishers
9. Potter, N. M., (1996) Food Science, CBS Publication
10. Ramaswamy, H. and Marcott, M. (2012), Food Processing Principles and Applications CRC Press
11. Ranganna, S. (1986) Handbook of Analysis and Quality Control for Fruits and Vegetable Products, (2nd ed.) TMH Education Pvt. Ltd
12. Srilakshmi, B. (2002). Nutrition Science. New Age International (P) Limited, New Delhi.
13. Swaminathan, M. (1987). Food Science, Chemistry and Experimental Foods, (2nd ed.)

Semester – V

.5.7 Field Project (FP)

Course Titles	Field Project (Pr)
Course Credits	2 Credit's
Course Outcomes	After going through the course, learners will be able to -
	1. Create and exhibit skills to effectively deliver nutrition messages using various channels for promoting healthy eating behaviors
	2. Design and execute community-based nutrition campaigns for select major health concerns in the community.
Module 1 (Credit 1): Nutrition Communication using Media & Tools for Select Basic Concepts in Nutrition	
Learning Outcomes	1. Develop Information Education & Communication (IEC) materials (leaflets, posters)
	2. Use appropriate communication tools social media, digital health interventions (mobile apps, blogs), and traditional folk media for the delivery of messages
Content Outline	<ul style="list-style-type: none"> • Message Development: Crafting clear, concise, and non-judgmental messages tailored to specific audiences • Material Design: Creating tools like leaflets, posters, and multimedia content for specific topics eg: sugar content in drinks or fibre content of food • Pretesting materials before full implementation to ensure comprehension and relevance • Delivery Channels: Utilizing various methods, including face-to-face and digital platforms to deliver the message
Module 2 (Credit 1): Community Campaign Planning and Execution	
Learning Outcomes	1. Design evidence-based community interventions for target audiences like community groups, or patients for public health concerns issues such as non-communicable diseases
	2. Implement, and evaluate the intervention
Content Outline	<ul style="list-style-type: none"> • Selection of Theme • Planning the Programme • Executing the Programme • Evaluation of the Programme

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Reading food labels to identify common preservatives and additives used in processed and preserved foods
- Short assignment on Nutrition Myths and Facts

- Making infographics related to nutrition information

References:

1. Nutrition Education: Linking Research, Theory, And Practice, 2020, Isobel R. Contento, Pamela A Koch, 4th Edition, Jones and Bartlett Publishers, Inc
2. Community Nutrition by V Srilakshmi, B;Suganthi, 2022

Course Syllabus

Semester – VI

.6.1 Major (Core)

Course Titles	Food Preservation (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Explain the causes of food spoilage and the principles underlying food preservation techniques
	2. Describe and compare traditional and modern methods of food preservation used in households and the food industry
	3. Demonstrate safe food handling, sanitation, and proper storage practices during food preservation processes
	4. Analyze the role of preservatives, packaging, and storage conditions in extending food shelf life
	5. Apply appropriate food preservation techniques to prepare preserved food products under hygienic conditions
Module 1 (Credit 1): Fundamental Principles of Food Preservation	
Learning Outcomes	1. Define food preservation and explain its importance in ensuring food safety, quality, and availability
	2. Identify the major causes of food spoilage, including microbial, enzymatic, chemical, and physical factors
	3. Explain the basic principles of food preservation, such as control of temperature, moisture, pH, and oxygen
	4. Describe different traditional and modern methods of food preservation used in households and the food industry
Content Outline	<ul style="list-style-type: none">• Introduction to Food Preservation• Importance and objectives of food preservation and traditional methods of food preservation• Factors affecting post-harvest storage stability of foods• Basic principles of Food Preservation• Causes of food spoilage
Module 2 (Credit 1): Methods of Food Preservation	
Learning Outcomes	1. Identify and classify different methods of food preservation into physical, chemical, and biological techniques
	2. Explain the principles and mechanisms involved in major preservation methods such as refrigeration, freezing, drying, canning, fermentation, and pickling

	3. Describe the role of sugar, salt, oil, acids, and chemical preservatives in preventing food spoilage
	4. Select appropriate preservation methods for different food commodities such as fruits, vegetables, dairy, and meat products
	5. Discuss the impact of preservation methods on food quality, nutritional value, and shelf life
Content Outline	<ul style="list-style-type: none"> • Asepsis and removal of microorganisms • Use of high temperature: Factors affecting heat resistance, TDT and Pasteurization. Canning and its use in food industry • Use of low temperature- Freezing, frozen storage, blanching, changes during storage and thawing • Drying or dehydration- factors affecting dehydration, pretreatments and post treatments, different techniques of dehydration • Use of preservatives, PFA classification of food preservatives- class I and class II preservatives, developed preservatives • Irradiation and applications in for various foods, advantages and disadvantages • Other methods- microwave heating, hurdle technology, wax emulsion
Module 3 (Credit 1): Asepsis and Preparation of Foods preserved using sugar, salt, and heat (Practical)	
Learning Outcomes	1. Demonstrate aseptic techniques and hygienic practices during the preparation and handling of preserved foods
	2. Apply proper cleaning, sterilization, and sanitation procedures for utensils, equipment, and containers used in food preservation
	3. Prepare food products preserved using sugar such as jams, jellies, or squashes by following standard procedures
	4. Prepare food products preserved using salt such as pickles or brined vegetables
	5. Perform preservation using heat treatments such as blanching, pasteurization, or bottling
Content Outline	<ul style="list-style-type: none"> • Introduction to Food Preservation – aseptic handling in lab • Preparation of products using sugar as the main preservative – Jam, Jelly, Squash, Synthetic Syrups • Preparation of products using salt as the main preservative – Pickles • Preparation of products preserved using heat/dehydration – sundrying and dehydration fruits and vegetables, demonstration

	of home-scale bottling and canning
Module 4 (Credit 1): Preparation of other Preserved products (Practical)	
Learning Outcomes	1. Identify suitable raw materials and ingredients required for the preparation of various preserved food products
	2. Prepare different types of preserved products such as chutneys, sauces, squashes, fruit beverages, and dehydrated foods using appropriate techniques
	3. Apply correct processing steps and preservation conditions to ensure product safety and quality
	4. Demonstrate proper handling, packaging, and storage practices for preserved food products
Content Outline	<ul style="list-style-type: none"> • Tomato sauce, Tomato Ketchup, Green and Red Chilli Sauce • Dry chutneys and masalas • Freezing of fruits and vegetables

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Preparation of preserved foods using various home-scale methods of food preservation
- Assignments on collecting information on traditionally preserved foods and modern methods of food preservation

References:

1. Desrosier, N. W. and Desrosier, J. N. (2004) The Technology of Food Preservation (4th ed.). CBS.
2. Sharma, A. (2019) Textbook of food Science and Technology (3rd ed.), CBS.
3. Sivasankar, B. (2022). Food Processing and Preservation. PHI.
4. Srivastava, P. (2013). Methods of food Preservation. Discovery Publishing House.
5. Srivastava, P. and Swaroop, A. (2014). Techniques of food Preservation. Discovery Publishing House.
6. Srivastava, R. P. and Sanjeev Kumar (2019). Fruit and Vegetable Preservation (3rd ed.). CBS.
7. Subbulakshmi, G. and Udipi, S. A. and Ghugre, Padmini. (2021). Food Processing and Preservation. New Age International Publishers.

Semester – VI

.6.2 Major (Core)

Course Titles	Public Health Nutrition for Maternal and Child Care (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Explain maternal and childhood nutritional requirements and concerns during pregnancy and lactation, importance of antenatal and postnatal care and causes and consequences of childhood nutritional problems and micronutrient deficiencies in relation to the first 1000 days of life
	2. Describe appropriate infant and young child feeding practices, including breastfeeding guidelines, complementary feeding, and nutritional requirements of infants and preschool children
	3. Evaluate the role of national nutrition programmes and community services in improving maternal and child nutritional status
	4. Analyze clinical case studies related to maternal and child nutrition problems and recommend appropriate dietary interventions
	5. Design, implement, and evaluate community-based nutrition education programmes by developing educational materials (posters, pamphlets, presentations) on maternal and child nutrition and relevant government nutrition initiatives
Module 1 (Credit 1): Maternal and Child Nutrition	
Learning Outcomes	1. Explain the importance of maternal nutrition requirements during pregnancy and lactation
	2. Identify and describe common maternal and child nutritional problems along with their nutritional implications
	3. Discuss and apply appropriate infant and young child feeding practices during the first 1000 days of life
Content Outline	<ul style="list-style-type: none"> • Maternal Nutrition & Health - nutritional requirements during pregnancy/ lactation, antenatal and postnatal care • Common nutritional problems during pregnancy - IDA, GDM, Pregnancy induced Hypertension • Breastfeeding guidelines, Positioning and attachment for breastfeeding, feeding preterm and/or low birth weight infants, WHO recommendations for infant feeding for HIV-Positive Women • Nutritional status in first 1000 days - Importance of breastfeeding, Colostrum feeding • Complementary feeding- Timing of introduction, Types of

	<p>complementary foods, weaning diet</p> <ul style="list-style-type: none"> Nutritional requirements of infants and preschool children and common nutritional problems in children: Low birth weight, Protein Energy Malnutrition (PEM), Micronutrient deficiencies
Module 2 (Credit 1): Public Health Programmes and Interventions for Mothers and Children	
Learning Outcomes	1. Explain the role of maternal and child health services in improving public health and nutritional status of mothers and children
	2. Describe major nutrition and health programmes in India
	3. Analyze the role of community-based strategies in improving maternal and child nutritional status
Content Outline	<ul style="list-style-type: none"> Role of maternal and child health services in public health Nutrition and health programmes in India: <ul style="list-style-type: none"> Pradhan Mantri Matru Vandana Yojana (PMMVY) Integrated Child Development Services (ICDS) POSHAN Abhiyaan PM POSHAN (Mid-Day Meal Scheme) Anaemia Mukta Bharat Weekly Iron and Folic Acid Supplementation Programme (WIFS) Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (SABLA) National Iron Plus Initiative Role of Anganwadi centres in maternal and child nutrition Community-based strategies to improve maternal and child nutritional status
Module 3 (Credit 1): Maternal Nutrition and IYCF Practices (Practical)	
Learning Outcomes	1. Apply dietary survey methods to assess the nutritional intake of pregnant and lactating women, infants, and young children, and modify diet plans based on nutritional requirements
	2. Analyze clinical case studies related to maternal and child nutritional problems and recommend appropriate dietary interventions
	3. Demonstrate and evaluate appropriate infant feeding practices
Content Outline	<ul style="list-style-type: none"> Dietary survey of pregnant / lactating women & modification of their diet plan Case Study on Nutritional Problems in Pregnancy

	<ul style="list-style-type: none"> ○ Iron Deficiency Anemia ○ Gestational Diabetes Mellitus ○ Pregnancy Induced Hypertension ● Demonstration of Breastfeeding Techniques Correct positioning of mother and baby, Proper attachment (latch) ● Infant Feeding Practices- colostrum feeding <ul style="list-style-type: none"> ○ Feeding preterm or low birth weight infants ○ Infant feeding for HIV-positive mothers according to World Health Organization recommendations ● Dietary survey of weaning diet given by mothers -modification of Complementary Feeding and Weaning Diet of infants after 6 months ● Assessment of Nutritional Problems in Children <ul style="list-style-type: none"> Low Birth Weight Protein Energy Malnutrition Micronutrient deficiencies
Module 4 (Credit 1): Maternal and Child Health & Nutrition Education and Communication (Practical)	
Learning Outcomes	1. Design nutrition education materials such as posters, pamphlets, and short presentations on topics related to maternal nutrition, infant feeding practices, and awareness of government nutrition programmes
	2. Plan and conduct a community-based nutrition education programme to promote healthy maternal and child nutrition practices
	3. Evaluate the effectiveness of the nutrition education programme using appropriate feedback and assessment mechanisms
Content Outline	<ul style="list-style-type: none"> ● Design nutrition education materials such as Posters, Pamphlets, Short presentations on: <ul style="list-style-type: none"> ○ Maternal nutrition, Infant feeding practices, Prevention of anemia, Importance of government nutrition programmes ○ Plan and conduct an appropriate nutrition education programme for community outreach ○ Evaluate the programme through a feedback mechanism

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Presentations or assignments reviewing public health programmes launched by the government to improve maternal and child health
- Preparation of nutrition education materials highlighting the importance of maternal nutrition during pregnancy and lactation and the nutritional needs of infants during the first 1000 days of life

- Conducting dietary surveys among pregnant and lactating women and suggesting appropriate dietary modifications based on their nutritional requirements
- Formulation and demonstration of nutrient-dense recipes, including weaning foods for infants
- Planning and implementation of nutrition education programmes or activities in community settings

References:

1. Ministry of Health and Family Welfare, Government of India. (n.d.). *Infant and young child feeding: One day sensitization module*. National Health Mission. https://www.nhm.gov.in/MAA/One_Day_Sensitization_Module/One_Day_Sensitization_Module_English_lowres.pdf
2. World Health Organization. (2013). *Counselling for maternal and newborn health care: A handbook for building skills* (Chapter 13: Breastfeeding). <https://www.ncbi.nlm.nih.gov/books/NBK304199/>
3. Ministry of Women and Child Development, Government of India. (n.d.). *Integrated Child Development Services (ICDS): About us*. <https://icds.gov.in/en/about-us>
4. Ministry of Health and Family Welfare, Government of India. (n.d.). *Anemia Mukta Bharat*. National Health Mission. <https://nhm.gov.in/index1.php?lang=1&level=3&lid=797&sublinkid=1448>
5. World Health Organization. (n.d.). *Complementary feeding*. <https://www.who.int/health-topics/complementary-feeding>
6. Indian Council of Medical Research & National Institute of Nutrition. (2020). *Dietary guidelines for Indians*. <https://www.nin.res.in>

Semester – VI

.6.3 A. Major (Elective)

Course Titles	Food Product Development (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Introduce the concepts, principles, and stages of food product development
	2. Develop students' ability to formulate, standardize, and evaluate new or modified food products
	3. Equip students with skills for sensory evaluation, quality assessment, and shelf-life studies
	4. Familiarize students with packaging, labeling, and basic marketing of new products
	5. Promote innovation, critical thinking, and problem-solving in food science and nutrition
Module 1 (Credit 1): Introduction to Food Product Development, Consumer Needs and Market Research	
Learning Outcomes	1. Define food product development and its scope in the food industry
	2. Explain the importance of innovation in product development
	3. List and describe the stages of product development: idea generation, screening, formulation, prototyping, testing, commercialization
	4. Understand the role of research and development in new product creation
	5. Conduct basic market research and surveys to identify consumer needs, preferences, and dietary trends, factors affecting food choice and acceptability
Content Outline	<ul style="list-style-type: none"> • Concept and scope of food product development, innovation and trends in food industry • Stages of product development • Role of R&D, patents, and intellectual property • Techniques for market research and data collection including consumer preferences and demographics, analysis of food trends and dietary patterns, product positioning and segmentation • Incorporating consumer feedback into product design
Module 2 (Credit 1): Product Formulation, Standardization, Evaluation, Packaging, and Marketing	

Learning Outcomes	1. Select appropriate raw materials and functional ingredients
	2. Standardize recipes for consistent quality, apply nutritional modification and value addition, conduct cost and yield analysis for product feasibility
	3. Conduct sensory evaluation using hedonic and analytical methods
	4. Design packaging and labeling as per regulations
	5. Understand marketing strategies and product commercialization
Content Outline	<ul style="list-style-type: none"> • Ingredient selection and formulation strategies, functional properties of ingredients (emulsification, gelling, stabilizing), recipe standardization and scaling up, nutritional enrichment and fortification • Costing, yield, and feasibility studies • Sensory evaluation techniques (taste, texture, aroma, appearance), Shelf-life and storage studies • Packaging materials, labeling, and regulatory considerations (FSSAI) • Marketing, promotion, and commercialization of food products
Module 3 (Credit 1): Introduction to Product Development (Practical)	
Learning Outcomes	1. Define food product development and scope of innovation in the food industry
	2. List and describe the stages of product development: idea generation, screening, formulation, prototyping, testing, commercialization
	3. Understand the role of research and development in new product creation, identify consumer preferences and dietary trends relevant to food products
	4. Conduct basic market research and surveys, explain product positioning and target market selection
Content Outline	<ul style="list-style-type: none"> • Orientation to food product development steps • Conducting consumer preference surveys • Development of any one product (for example): <ul style="list-style-type: none"> ○ value-added cereal or snack products ○ fruit/vegetable-based products (juices, jams, sauces) ○ protein-enriched foods (dairy, legumes, or alternative proteins)
Module 4 (Credit 1): Standardization, Quality Evaluation, Packaging and Presentation (Practical)	
	1. Select raw materials and functional ingredients for product

	development
	2. Develop recipes and standardize formulations for consistent quality
	3. Apply nutritional modifications and value addition to new products, perform cost analysis and yield calculations for product feasibility
	4. Design packaging and labeling according to regulations
	5. Understand marketing strategies and product commercialization
Content Outline	<ul style="list-style-type: none"> • Designing packaging and labeling for developed products • Documentation of preparation, evaluation, and product description • Presentation of developed product prototypes

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Develop a new or modified food product using local ingredients
- Conduct sensory evaluation, yield calculation, and cost analysis
- Design packaging and labeling, and present a mini-marketing plan

References:

1. Sharma, A. (2018). Food product development. CBS Publishers & Distributors
2. Mishra, H. N. (Ed.). (2018). Food product and process innovations (Vols. 1–2). New India Publishing Agency
3. Bakshi, A. K., Joshi, V. K., Vaidya, D., & Sharma, S. (Eds.). (2013). Food processing and preservation (Vols. 1–2). Jagminder Book Agency
4. Anandharamakrishnan, C., & Subramanian, P. (Eds.). (2023). Industrial application of functional foods, ingredients and nutraceuticals: Extraction, processing and formulation of bioactive compounds. Academic Press
5. Anandharamakrishnan, C., Moses, J. A., & Anukiruthika, T. (2023). Food digestion and absorption: Its role in food product development. Royal Society of Chemistry
6. Varghese, S. M., Parisi, S., Singla, R. K., & Begum, A. S. A. (2022). Trends in food chemistry, nutrition and technology in the Indian sub-continent. Springer
7. Indian Council of Agricultural Research. (n.d.). Textbook of food science and technology. ICAR
8. Indian Council of Agricultural Research. (n.d.). Textbook of food engineering. ICAR
9. Mudgil, D., & Mudgil, S. (2023). Food science and technology for ICAR AIEEA (PG). Scientific Publishers
10. Singh, A. K. (n.d.). Food technology (ICAR e-course). ICAR e-Krishi Shiksha

Semester – VI

.6.3 B. Major (Elective)

Course Titles	Medical Nutrition Therapy - II (Th+Pr)
Course Credits	4 Credit's (2 Th + 2 Pr)
Course Outcomes	After going through the course, learners will be able to -
	1. Explain the etiology, pathophysiology, and clinical features of Hepatobiliary & Pancreatic Disorders
	2. Analyze the role of nutrition and dietary principles in the prevention and management of various disease conditions
	3. Apply dietary planning techniques, nutrient calculations, and therapeutic diet principles for the nutritional management of different clinical conditions
	4. Design appropriate therapeutic diets and meal plans based on the specific nutritional requirements of individuals with various diseases
Module 1 (Credit 1): Medical Nutrition Therapy For Hepatobiliary & Pancreatic Disorders	
Learning Outcomes	1. Explain the etiology and pathophysiology of hepatobiliary, pancreatic disorders, Renal & Pulmonary Disorders
	2. Analyze the dietary considerations and nutritional requirements involved in the management of liver, gallbladder, and pancreatic disorders
	3. Apply appropriate dietary strategies and nutrient modifications in the nutritional management of hepatobiliary and pancreatic diseases
	4. Design suitable dietary modifications and meal plans for individuals with liver, gallbladder, and pancreatic disorders
Content Outline	<ul style="list-style-type: none"> • Etiology, Pathophysiology, Dietary considerations and modifications for: <ul style="list-style-type: none"> ○ NAFLD/ MASLD ○ Alcoholic Liver Disease ○ Hemochromatosis, Wilson's Disease ○ ESLD – Portal Hypertension, Ascites Hyponatremia ○ Disease of Gallbladder- Cholestasis, Cholelithiasis, Cholecystitis ○ Disease Pancreas- Pancreatitis
Module 2 (Credit 1): Medical Nutrition Therapy For Renal & Pulmonary Disorders	
Learning	1. Explain the etiology and pathophysiology of renal disorders and

Outcomes	pulmonary disorders
	2. Analyze the dietary considerations and nutritional requirements involved in the management of renal and pulmonary disorders
	3. Apply dietary planning techniques including sodium, potassium, and fluid calculations, as well as high-protein dietary planning for appropriate clinical conditions
	4. Design suitable dietary modifications and meal plans for individuals with renal and pulmonary disorders
Content Outline	<ul style="list-style-type: none"> • Etiology, Pathophysiology, Dietary considerations and modifications for: <ul style="list-style-type: none"> ○ RENAL – <ul style="list-style-type: none"> ✓ Nephrolithiasis – calcium, oxalate and uric acid stones ✓ AKI, CKD ESRD (sodium, potassium & fluid calculation) ○ Pulmonary – <ul style="list-style-type: none"> ✓ ASRD, COPD, Pneumonia, Bronchitis, Tuberculosis (high protein diet)
Module 3 (Credit 1): Therapeutic modifications for Hepatobiliary & Pancreatic Disorders (Practical)	
Learning Outcomes	1. Modify diets for hepatobiliary & pancreatic disorders and apply nutritional principles for specific conditions
	2. Consider practical aspects of therapeutic meal planning
	3. Interpret biochemical reports
Content Outline	<ul style="list-style-type: none"> • Interpretation of biochemical reports for planning Medical Nutrition Therapy (MNT) for: <ul style="list-style-type: none"> ○ NAFLD/ MASLD ○ Alcoholic Liver Disease ○ Hemochromatosis, Wilson’s Disease ○ ESLD – Portal Hypertension, Ascites Hyponatremia ○ Disease of Gallbladder- Cholestasis, Cholelithiasis, Cholecystitis ○ Disease Pancreas- Pancreatitis
Module 4 (Credit 1): Therapeutic modifications Renal & Pulmonary Disorders (Practical)	
Learning Outcomes	1. Modify diets for Renal & Pulmonary Disorders
	2. Apply nutritional principles for specific conditions
	3. Consider practical aspects of therapeutic meal planning
	4. Interpret biochemical reports

Content Outline	<ul style="list-style-type: none"> • Interpretation of biochemical reports for planning Medical Nutrition Therapy (MNT) for: <ul style="list-style-type: none"> • RENAL – Nephrolithiasis – calcium, oxalate and uric acid stones AKI, CKD ESRD (sodium, potassium & fluid calculation) • Pulmonary – ASRD, COPD, Pneumonia, Bronchitis, Tuberculosis (high protein diet)
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Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Group analysis of clinical case studies and recommendation of appropriate Medical Nutrition Therapy (MNT)
- Presentations on recent research papers and evidence-based guidelines for the management of various metabolic disorders
- Group discussions and dietary recommendations for case studies involving multiple or overlapping clinical conditions

References:

1. Mahan, L.K. and Escott-Stump, S. (2014): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
3. Escott-Stump, S. (1998): Nutrition and Diagnosis-Related Care, 4th Edition, Williams and Wilkins.
4. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
5. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.
6. Davis, J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd Edition, W.B. Saunders Co.
7. Walker, W.A. and Watkins, J.B. (Ed) (1985): Nutrition in Pediatrics, Boston, Little, Brown & Co.
8. Guyton, A.C. and Hall, J.E. (1999): Textbook of Medical Physiology, 9th Edition, W.B. Saunders Co.

Semester – VI

.6.4 Minor Stream

Course Titles	Food Safety and Preservation in Practice (Pr)
Course Credits	2 Credit's
Course Outcomes	After going through the course, learners will be able to -
	Choose food ingredients based on the factors affecting food selection for different categories of food and preparation
	Choose foods based on recipe to be prepared
	Store foods safely – pre-preparation
	Developing basic skills needed for preparing preserved foods
	Store and handle foods safely - post preparation
Module 1 (Credit 1): Fundamentals of Selection of Ingredients, Preparation & Storage of Select Recipes (Practical)	
Learning Outcomes	1. Select appropriate ingredients and pre-prepare for select recipes
	2. Prepare recipes and storage them appropriately considering food safety
Content Outline	<ul style="list-style-type: none">• Selection and pre-preparation of ingredients of select recipes, preparation and storage of raw recipes- salad, chutney• Selection and pre-preparation of ingredients of select recipes, preparation and storage of recipes with vegetables• Selection and pre-preparation of ingredients of select recipes, preparation and storage of recipes with milk, curd, paneer• Selection and pre-preparation of ingredients of select recipes, preparation and storage of recipes with egg
Module 2 (Credit 1): Preparation, storage and handling of Preserved Foods (Practical)	
Learning Outcomes	1. Implement basic skills – asepsis during preparation of select food preserves
	2. Store and handle preserved foods considering food safety
Content Outline	<ul style="list-style-type: none">• Preparation of preserved foods using sugar as a preservative – Syrups/Squash and Jam• Preparation of preserved foods using salt and spices as a preservative – Pickles• Preparation of frozen vegetables• Preparation of dry masalas

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Group discussion on selection of recipes ingredients

- Preparation and storage of the select preserved foods

References:

1. ICMR (2017). Indian Food Composition Tables. National Institute of Nutrition, Hyderabad, India
2. ICMR-NIN Expert Group on Nutrient Requirement for Indians, Recommended Dietary Allowances (RDA) and Estimated Average Requirements (EAR) – 2020
3. Indian Council of Medical Research (2024), National Institute of Nutrition (NIN). Dietary Guidelines for Indians
4. Mudambi, S.R., Rajgopal, M.V. (2012), Fundamentals of Foods and Nutrition, New Age International Pvt. Ltd.
5. Srilakshmi, B. (2020) Dietetics. 9th Edition, New Age International Publisher, New Delhi

Semester – VI

.6.5 Minor Stream

Course Titles	Food Safety and Preservation in Practice (Th)
Course Credits	4 Credit's
Course Outcomes	After going through the course, learners will be able to -
	1. Explain the basic principles and importance of food preservation in preventing spoilage and ensuring food safety
	2. Describe the causes of food spoilage and factors affecting the perishability of different foods
	3. Discuss the principles and processes of common food preservation methods such as refrigeration, drying, pickling, salting, pasteurization, sterilization, canning, and bottling
	4. Identify appropriate preservation techniques for different types of foods based on their characteristics and storage requirements
	5. Evaluate the role of proper storage and preservation practices in maintaining food quality, safety, and shelf life
Module 1 (Credit 1): Food Perishability, Selection, and Storage	
Learning Outcomes	1. Explain the major causes of food spoilage, including microbial, enzymatic, chemical, and environmental factors
	2. Differentiate between perishable, semi-perishable, and non-perishable foods based on their composition and susceptibility to spoilage
	3. Identify quality characteristics for selecting fresh foods and demonstrate appropriate storage practices
	4. Apply knowledge of food spoilage and storage principles to recommend safe household food storage methods
Content Outline	<ul style="list-style-type: none">• Reasons for food spoilage• Perishability of foods and factors affecting perishability of foods• Selection and storage of cereals and pulses, fruits and vegetables, milk and milk products, eggs, meat, fish and poultry
Module 2 (Credit 1): Basic Methods of Food Preservation	
Learning Outcomes	1. Describe the basic principles of refrigeration, pasteurization, and sterilization in preserving foods
	2. Explain traditional preservation methods such as pickling, salting, curing, and smoking
	3. Identify the role of sun drying and dehydration in extending the shelf life of foods
	4. Explain the processes involved in canning and bottling of foods

Content Outline	<ul style="list-style-type: none"> • Refrigeration, Pasteurization, Sterilization • Pickling, Salting, Curing, Smoking of foods • Sundrying and Dehydration • Canning and Bottling
Module 3 (Credit 1): Food Additives and Food Regulations	
Learning Outcomes	1. Identify natural and chemical preservatives used in food preservation and explain their basic functions
	2. Describe commonly used chemical preservatives in foods and their role in preventing spoilage and microbial growth
	3. Explain the basic principles and importance of the Hazard Analysis Critical Control Point system in ensuring food safety
	4. Describe the role and functions of the Food Safety and Standards Authority of India in regulating food safety and quality
Content Outline	<ul style="list-style-type: none"> • Natural and chemical preservatives • Chemical preservatives used in preservation of foods • Principles, Applications and significance of HACCP • FSSAI
Module 4 (Credit 1): Food Packaging	
Learning Outcomes	<ul style="list-style-type: none"> • Explain the reasons and importance of food packaging in protecting food quality and safety and identify different techniques used in food packaging • Recognize common materials used for packaging foods, such as glass, metal, plastic, and paper and select appropriate packaging methods for different types of foods
Content Outline	<ul style="list-style-type: none"> • Reasons for Food packaging • Different techniques and materials used for food packaging

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Home-scale Food Safety Audit
- Assignment on reading food labels
- Case-study report of home-scale preserved foods

References:

1. Food Processing Preservation, Subbulakshmi G and Udipi Shubha N.D, New Age Int. (P) Ltd 2001
2. Food Science, Srilakshmi B, 7th Edition, New Age Int. (P) Ltd 2015
3. Foods: Facts and Principles, Manay Shakuntala, Shadaksharaswamy M, 2nd Edition, New Age Int. (P) Ltd 2001

4. Foundation of Food Preparation, Fuelar-Graves, Pedcham Gladys C., 5th Edition, Macmillan Publishing Company 1987
5. FSSAI Handbook

Semester – VI

.6.6 On Job Training (OJT)

Course Titles	On the Job Training Food Science & Nutrition (2 Pr)
Course Credits	2 Credit's
Course Outcomes	After going through the course, learners will be able to –
	1. Provide real-world exposure to professional settings in food science, nutrition, and allied fields.
	2. Develop practical skills in food handling, processing, quality evaluation, and nutrition counseling.
	3. Familiarize students with industrial, clinical, or community-based applications in food science and nutrition.
	4. Enhance problem-solving, reporting, and professional communication skills in real-life scenarios.
INTERNSHIP	
Learning Outcomes	1. Demonstrate professional behavior, hygiene, and safety practices in food and nutrition workplaces.
	2. Apply knowledge of food science and nutrition to practical tasks in industry, clinical, or community settings.
	3. Conduct food preparation, product development, dietary assessment, and nutrition counseling under professional supervision.
	4. Evaluate quality, safety, and compliance of food products and services in real-world settings.
	5. Document work processes, observations, and outcomes in a professional internship report.
	6. Reflect on learning experiences and professional skills acquired, and propose improvements or innovations.
Content Outline	<ul style="list-style-type: none"> • Internship Structure & Activities <ul style="list-style-type: none"> ○ Suggested Placement Areas: <ul style="list-style-type: none"> ○ Food industry: quality control, production, R&D, product development ○ Clinical/Nutrition setups: hospitals, community nutrition centers, dietary assessment programs ○ Community or NGO-based nutrition programs ○ Food testing labs or regulatory agencies • Typical Activities During Internship:

	<ul style="list-style-type: none"> ○ Observing and participating in food production and quality control procedures ○ Conducting sensory evaluation, shelf-life studies, and product standardization ○ Assisting in dietary planning, counseling, or nutrition education programs ○ Participating in food safety audits and hygiene inspections ○ Preparing a mini-project or case study based on the internship experience
PROJECT	
Learning Outcomes	1. Provide students with hands-on experience in applied food science and nutrition projects.
	2. Enable students to design, implement, and evaluate projects relevant to food product development, nutrition interventions, or food quality assessments.
	3. Develop analytical, documentation, and professional communication skills in a real-world context.
	4. Encourage innovation, problem-solving, and critical thinking in applied food science and nutrition.
Content Outline	<ul style="list-style-type: none"> ● Students may undertake projects based on: ● Nutritional Assessment / Dietetics <ul style="list-style-type: none"> ○ Community-based nutritional surveys ○ Diet planning and analysis for specific population groups ○ Nutritional intervention and evaluation of outcomes ● Applied Research in Food Science and Nutrition <ul style="list-style-type: none"> ○ Experimental or applied research on functional foods, fortified foods, or novel ingredients ○ Comparative studies on food processing methods or nutrient retention ○ Project-based case studies on local or regional foods

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Internship:

- Maintain a daily work log or internship diary
- Participate in assigned professional tasks
- Collect relevant data and observations
- Prepare a comprehensive internship/project report

- Deliver a presentation on their experience and finding

Project:

- Identify research or applied project topics under faculty supervision
- Develop objectives, methodology, and timelines for the project
- Perform experiments, surveys, or fieldwork as per the project plan
- Collect and analyze data, observations, and results
- Prepare a professional project report
- Deliver a presentation or demonstration of the project findings