

ಮಂಗಳೂರು
MANGALORE



ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
UNIVERSITY

ಕ್ರಮಾಂಕ/No: MU/ACC/CR 7/2024-25/A8

ಕುಲಸಚಿವರ ಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ- 574 199
Office of the Registrar
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ದಿನಾಂಕ/Date: 09/07/2026

NOTIFICATION

Sub: Syllabi of UG Programmes/Courses under the Faculty of Science and
Technology as per the SEP guidelines reg.

Ref: Decision of the Academic Council meeting dated: 29.06.2026

Pursuant to the above the syllabi of following UG programmes/Courses, prepared in accordance with the guidelines of the SEP commission and approved by the Academic Council at its meeting held on 29.06.2026 are hereby notified for implementation with effect from the academic year 2026-27 .

Sl.No.	UG Programmes/Courses
1.	B.Sc (Food Technology)(V -VI sem)
2.	B.Sc.(Food Nutrition and Dietetics) (V-VI sem)
3.	B.Sc(Animation & Visual Effects) (V -VI sem)
4.	BCA (V -VI sem)
5.	BCA (Data Analytics) (V -VI sem)
6.	BCA(Artificial intelligence and Machine Learning) (V -VI sem)
7.	B.Sc (Fashion Design) (V-VI sem)
8.	Computer Science-(V-VI sem)
9.	Biotechnology-(V-VI sem)
10.	Microbiology (changes in skill courses)
11.	Environmental Science(I-II sem)

Copy of the syllabi shall be downloaded from the Mangalore University website
www.mangaloreuniversity.ac.in


REGISTRAR.

To:

- 1) The Registrar(Evaluation),Mangalore University.
- 2) The Chairpersons, U.G BOS in concerned subjects, Mangalore University.
- 3) The Director, College Development Council, Mangalore University.
- 4) The Principal's of all affiliated/Constituent colleges of Mangalore University.
- 5) The Director, computer centre, Mangalore University.
- 6) The Assistant Registrar/The superintendent, Academic section, O/O the Registrar,
Mangalore university.
- 7) Guard file.



Structure of B.Sc.
Food Nutrition and Dietetics

V and VI Semesters

(SEP Model)

Model Curriculum

Name of the Degree Program: B.Sc. (Basic)

Discipline Core: Food Nutrition and Dietetics

Total Credits for the Program:

Starting year of implementation: 2024

Program Outcomes (POs)

After successful completion of this program, graduates of Food Nutrition and Dietetics will have the following attributes:

1. Scientific Knowledge: Apply the knowledge of food science, chemistry, nutrition, physiology and dietetics in a competent manner to innovate in the field of nutrition and dietetics.
2. Design and Development of Solutions: Design nutrition and dietetics strategies as per the specified requirements of regulatory bodies related to food, health, environment, hospitals, families and communities.
3. Problem Analysis: Identify, formulate, rationalise, and analyse nutrition-related problems in the community and hospitals so as to reach substantiated diet-based conclusions using the principles of food nutrition and dietetics.
4. Modern Tool usage: Create, select, and apply modern nutrition and dietetics tools, techniques, and resources of relevance in nutrition and dietetics.
5. Environment and Sustainability: Evolve nutrition and dietetics approaches in the context of food security and environmentally sustainable development goals.
6. Teamwork: Function objectively as an individual and as a member in diverse teams.
7. Communication: Effectively document and communicate nutrition and dietetics approaches and plans with individuals, patients and communities.
8. Lifelong learning: Independently engage in continuous learning to adapt to newer concepts in nutrition and dietetics.

Program Specific Outcomes (PSOs):

After successful completion of this program, graduates of Food Nutrition and Dietetics will have the following specific attributes:

- Utilize the knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes
- Evaluate the food product and the application of necessary preservation techniques to increase the shelf life of the product and also be a part in the auditing industry
- Work in Research laboratories on the fortification and enrichment of existing product as well as the development of new product
- Apply the nutrition and dietetics-based knowledge and skills in the planning and assessment of suitable diets for individuals of every age, patients and the community in a sustainable manner.
- Provide nutrition counselling and education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies
- Apply technical skills, knowledge of health behaviour, clinical judgment, and decision-making skills when assessing and evaluating the nutritional status of individuals and communities and their response to nutrition intervention.
- Implement strategies for food access, procurement, preparation, and security for individuals, families, and communities.

- Apply food science knowledge to describe functional properties of food ingredients.
- Apply the knowledge of principles and techniques of nutrition and dietetics for research-based approaches.
- Apply skills gained in nutrition and dietetics for research, development, and entrepreneurship.

Assessment:

Weightage for assessments (in percentage)

Type of Course	Weightage in Marks	
	Formative Assessment	Summative Assessment
Theory	20	80
Practical	10	40
Projects	10	40
Experiential Learning (Internships etc.)	10	40

Scheme and Syllabus for B.Sc. Degree in Food Nutrition and Dietetics

Course/PaperTitles	Instructions Hours/Week	Duration of exam (Hours)	Marks			Credits
			IA	Exam	Total	
SEMESTER V						
Therapeutic Nutrition – I	3	3	20	80	100	3
Nutritional Biochemistry – I	3	3	20	80	100	3
Food Preservation - I	3	3	20	80	100	3
Diet Counselling	3	3	20	80	100	3
Food packaging and labelling	3	3	20	80	100	3
Food Product Development and Sensory analysis	3	3	20	80	100	3
Therapeutic Nutrition – I Practical	4	3	10	40	50	2
Nutritional Biochemistry - I Practical	4	3	10	40	50	2
Food Preservation - I Practical	4	3	10	40	50	2
Specialized diet product formulation and its nutritional evaluation(skill/practical based compulsory course)	2		10	40	50	2
	32				800	26
SEMESTER VI						
Therapeutic Nutrition – II	3	3	20	80	100	3
Nutritional Biochemistry – II	3	3	20	80	100	3
Food Preservation - II	3	3	20	80	100	3
Functional Foods and Nutraceuticals	3	3	20	80	100	3
Community Nutrition	3	3	20	80	100	3
Food For Health	3	3	20	80	100	3
Therapeutic Nutrition – II practical	4	3	10	40	50	2
Nutritional Biochemistry – II practical	4	3	10	40	50	2
Food Preservation – II practical	4	3	10	40	50	2
Internship/Project	2		10	40	50	2
	32				800	26
**Credits = 2 **No regular classes or examinations for skill based compulsory course ** C1= 10 MARKS (Internal) C2=40 MARKS(External) (20 Work carried out, 10 Report, 10 Presentation and viva voce)						

Program Name	B. Sc Food Nutrition and Dietetics	Semester	Fifth Semester
Course Title	Therapeutic Nutrition – I (Theory + Practical)		
Course Code:		No. of Theory + Practical Credits	3+2
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s):Diploma with minimum 45%

Course Outcomes:

After the successful completion of the course, the student will be able to:

- CO 1. Understand the role of the dietician in preventive, promotive and curative health care
CO 2. Appropriate dietary modification for various disease conditions based on physiology
CO 3. Interpret the role of the dietician through dietary management in disorders associated with pancreas, liver and gall bladder.
CO 4. Assess the role of dietician through dietary management in kidney dysfunction

Course Objectives:

- Analyze disease pathology and metabolic changes.
- Design custom Medical Nutrition Therapy plans.
- Assess patient progress using clinical data.
- Manage specialized enteral and parenteral feeding.

Content of Theory	36 Hrs
Unit-1	09

Definition of metabolic disorders. Definition of Diabetes mellitus. Classification and types - IDDM, NIDDM, Gestational Diabetes and MRDM, impaired Glucose tolerance (IGT), Pre-diabetes, MODY. Insulin resistance- Aetiology and symptoms. Diagnosis tests – Urinary sugar test, Glycosuria, Ketonuria, RBS, OGTT, and Glycosylated Hemoglobin test (HbA1c). Complications in diabetes- Acute complication - hypoglycaemia, hyperglycaemia, ketoacidosis, Chronic complications– heart disease, diabetic retinopathy, diabetic nephropathy, diabetic neuropathy, infections and wound healing. Treatment–biochemical criteria: urine sugar testing and blood glucose monitoring. Drug therapy–commonly used hypoglycaemic drugs, Insulin and its types. Management of diet in Diabetes –objectives, factors to be considered for planning diabetic diet, macronutrients, micronutrients, dietary fiber, foods permitted/avoided. Glycemic index (GI): definition, formula for GI, factors affecting GI, glycaemic indices of some common foods, Glycaemic load. Special concerns– alcohol, hypoglycaemia, illness or sick days, travel, eating out, stress. Artificial sweeteners – low calorie sweeteners and non – calorie sweeteners.

Unit-2	09
Functions of liver. Agents responsible for liver damage. Damage caused to the liver. Infective hepatitis: definition, viruses responsible for hepatitis, aetiology for acute and chronic hepatitis. Dietary management – objectives, macronutrients, micronutrients, general considerations, and foods allowed/not allowed. Cirrhosis of liver. Definition, aetiology, symptoms. Pathogenesis of alcoholic liver disease (ALD). Complications – ascites, portal hypertension, oesophageal varices, hepatic coma: Dietary management–objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed.	
Unit-3	09
Gall bladder diseases: terms–cholestasis, cholelithiasis, cholecystitis, cholecystectomy, biliary sludge. Functions of gall bladder. Cholecystitis – definition, types – acute and chronic phases, risk factors. Types of gallstones – Cholesterol stones, pigment stones and mixed stones. Dietary management– objectives, macronutrients, micronutrients, general considerations, and foods allowed/not allowed. Pancreatitis – definition, clinical features. Acute pancreatitis–aetiology, symptoms, complications and dietary management. Chronic pancreatitis–aetiology, symptoms, dietary management, special considerations and guidelines.	
Unit-4	09
Functions of the kidney. Glomerulonephritis (Nephritis), Renal failure – acute and chronic: definitions, causes, symptoms and metabolic changes. Dietary management – objectives, macronutrients, micronutrients, general considerations, and foods allowed/not allowed. Nephrotic syndrome– definition, symptoms, metabolic changes. Dietary management–objectives, macronutrients, micronutrients, general considerations, foods allowed/not allowed. Urolithiasis (Kidney stones / uremia) – definition, causes, symptoms, types of kidney stones. Dietary management – objectives, macronutrients, micronutrients, general considerations, and foods allowed/not allowed. Dialysis – definition, types of dialysis. Dietary management–objectives, macronutrients, micronutrients, general considerations, and foods allowed/not allowed.	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weight age in Marks
Test1	05
Test2	05
Assignment/Seminar	05
Project	05

Total	20Marks
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Course Title	Therapeutic Nutrition I (Practical)	Practical Credits	2
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Course Outcomes:

After successful completion of this course, students will be able to:

CO 1. Plan, prepare and calculate major nutrients in therapeutic nutrition

CO 2. Carry out the 24 hrs recall method

CO 3. Formulate diet for Diabetes mellitus and kidney dysfunction/renal disease

CO 4. Prepare diets for pancreatic and gall bladder disease

Content of Practical

Planning, preparing, screening and analysing the risk strategies with disease specific conditions and establishing a therapeutic nutritional support for the following case

1. 24 hrs recall method
2. Diabetes mellitus
3. Liver disease
4. Renal disease
5. Pancreatic disease
6. Gall bladder disease

Pedagogy

Formative Assessment	
Assessment Occasion/type	Weightage in Marks
Test	05
Practical Record	03
Participation and Involvement	02
Total	10Marks

References

- Mahan, L. K., Raymond, J. L., & Escott-Stump, S. (2024). Krause's food and the nutrition care process (16th ed.). Elsevier.
- Antia, F. P., & Abraham, P. (2002). Clinical dietetics and nutrition (4th ed.). Oxford

University Press.

- Nix, S. (2021). Williams' basic nutrition and diet therapy (16th ed.). Elsevier.
- Sharma, A. (2026). Principles of therapeutic nutrition and dietetics (2nd ed.). CBS Publishers & Distributors.
- Joshi, S. A. (2023). Nutrition and dietetics with Indian case studies (5th ed.). McGraw Hill Education.
- Srilakshmi, B. (2022). Dietetics (8th ed.). New Age International Publishers.
- Srilakshmi, B. (2023). Nutrition science (8th ed.). New Age International Publishers.
- Khanna, K., Gupta, S., Seth, R., Passi, S. J., Mahna, R., & Puri, S. (2020). Textbook of nutrition and dietetics (3rd ed.). Phoenix Publishing House.

Program Name	BSc Food Nutrition and Dietetics		Semester	Fifth Semester
Course Title	Food Preservation I (Theory + Practical)			
Course Code:		No. of Theory and Practical Credits	3+2	
Contact hours	36 hrs		Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80	

Course Pre-requisite(s): Diploma with minimum 45%

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO 1. Understand the basic concepts, principles, methods and parameters of food preservation
- CO 2. Describe the types and variety of foods based on spoilage and factors that favour the growth of microbes
- CO 3. Differentiate between the various preservation techniques based on food type
- CO 4. Evaluate factors affecting preservation and effects on food quality
- CO 5. Understand basic concepts of food preservation by increasing or decreasing temperature
- CO 6. Assess the types of heating and high temperatures to understand the advantages in food preservation
- CO 7. Evaluate types of freezing suitable for food preservation
- CO 8. Understand and describe chemical preservation of foods including impacts on health

Course objectives:

- Identify factors causing food spoilage.
- Apply thermal and modern preservation methods.
- Optimize techniques to retain food quality.

Design safe, HACCP-compliant processing workflows.	
Content of Theory	36 Hrs
Unit-1	09
Definition, Importance of food preservation. Causes of food spoilage-microorganisms, enzymes, insects, parasites and rodents, environmental factors and measures to control them. Classification of food by ease of spoilage. General principles of food preservation. Methods of food preservation- asepsis (keeping out of microorganisms), maintenance of aseptic condition, removal of microorganisms-clarification, filtration, centrifugation and other emerging techniques. Classification of food for processing.	
Unit-2	09
Preservation with high concentrations: Concept of food concentration. Sugar concentrates - general principles. Methods of preparation of jam, jellies and marmalade, tests of doneness, problems in jam and jelly preparation. Factors affecting gel formation. Definition, preservation and preparation of crystallized and glazed fruits, squashes and syrups. Types of syrups. Temperature test for syrups and candies. Salt concentrates -general principles. Role of ingredients in preparation of pickles. Types of pickles.	
Unit-3	09
Irradiation: Definition, principles, Sources of radiation, mechanism of irradiation, Units of irradiation, Dosimetry, mode of action. Use of radioisotopes in irradiation, Effects on foods and nutrients, Advantages and disadvantages. Uses, Effect of food irradiation on food quality. Preservation with chemicals: Characteristics of chemical preservatives, Classification of preservatives, Types of organic and inorganic preservatives, uses, natural preservatives, antibiotics, antioxidant, anti-browning, cleaning, sanitizing and fungicidal agents–mode of action, uses. Health impacts due to excessive use of chemical preservatives	
Unit-4	09
Drying: Definition, General Principle, Methods of drying – Sun/solar drying, artificial drying. Types of driers: air convection drier, drum/roller drier, vacuum drier, freeze drier, vacuum belt driers, osmotic drying. Factors controlling drying and dehydration. Dehydration: Definition, principles, pre-treatments for drying, changes during drying, effects of drying on nutritive value.	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks

Test1	05
Test2	05
Assignment/Seminar	05
Project	05
Total	20Marks

Course Title	Food Preservation (Practical)	Practical Credits	2
Content of Practical			
1. Preparation and preservation study of the following recipes– Jellies Jams Squashes Pickles 2. To estimate the acidity of fruit juice 3. Dehydration of vegetable samples 4. Qualitative test for milk samples – MBRT, resazurin, phosphatase, turbidity 5. Isolation of microorganisms from food samples 6. Sampling of water- membrane filtration techniques 7. Visit to food industry			

Pedagogy

Formative assessment	
Assessment Occasion/type	Weightage in Marks
Test	05
Practical Record	03
Participation and Involvement	02
Total	10Marks

References
- Modern Food Microbiology Jay, J. M. (2000). Modern Food Microbiology (6th ed.). Aspen Publishers, Maryland, USA. - Rahman, M. S. (Ed.). (2007). Handbook of Food Preservation (2nd ed.). CRC Press, Boca

Raton, Florida.

- Zeuthen, P., & Bøgh-Sørensen, L. (2003). Food Preservation Techniques. Woodhead Publishing Ltd., Cambridge, UK.
- Toledo, R. T. (2007). Fundamentals of Food Process Engineering (3rd ed.). Springer.
- Fellows, P. J. (2017). Food Processing Technology: Principles and Practice (4th ed.). Woodhead Publishing.
- Potter, N. N., & Hotchkiss, J. H. (2006). Food Science (5th ed.). CBS Publishers & Distributors.
- Johnson R, Anderson MT (2012) Food Preservation, Manay NS, Shadaksharaswamy M(2010)Foods-Facts and principles, New Age International Publ., New Delhi

Program Name	BSc Food Nutrition and Dietetics	Semester	Fifth Semester
Course Title	Nutritional Biochemistry - I (Theory + Practical)		
Course Code:		No. of Theory Credits	3+2
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s):Certificate with minimum 45%

Course Outcomes:

After the successful completion of the course, the student will be able to:

- CO 1. Obtain an insight into the biochemistry of major nutrients and physiologically important compounds such as proteins and hormones
- CO 2. Understand the principles of biochemistry (as applicable to human nutrition).
- CO 3. Appreciate types and changes in protein structure and associated malnutrition
- CO 4. Comprehend the role of vitamins and minerals and associated disorders

Course objective:

- Map macronutrient digestion and metabolic pathways.
- Explain cellular energy capture and utilization.
- Evaluate how micronutrients function as coenzymes.
- Link biochemical disruptions to metabolic diseases.

Content of Theory	36 Hrs
Unit-1	09

Carbohydrates: Nomenclature, Classification of carbohydrates – monosaccharides, oligosaccharides, polysaccharides – examples and structure. Metabolism – Glycolysis, TCA cycle, HMP Shunt, Glycogenesis, Glycogenolysis. Carbohydrate digestion and absorption. Importance of carbohydrates.	
Unit-2	09
Lipids: Nomenclature, Classification of simple lipids – fats, oils, waxes. Complex lipids – phospholipids, glycolipids. Derived lipids – steroids, terpenes, carotenoids with examples, structure and function. Digestion and absorption. Fatty acids – classification – essential and non-essential fatty acids, examples, properties, functions. Metabolism – β -oxidation of saturated fatty acids. Biosynthesis and catabolism of cholesterol	
Unit-3	09
Biological oxidation and enzymes: Compounds of ETC: structural organisation of respiratory chain: multiprotein complexes in ETC, mechanism, oxidative phosphorylation, high energy phosphate – ATP-ADP cycle and energy conservation.	
Unit-4	09
Enzymes: Definition, nomenclature, types and classification of enzymes. Active site. Definition, types of coenzymes, specificity of enzymes. Isoenzymes, enzyme kinetics, factors affecting velocity of enzymes catalysed reactions. Regulation of enzyme activity, enzyme inhibition	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test2	05
Assignment/Seminar	05
Project	05
Total	20Marks

Course Title	Nutritional Biochemistry – I (Practical)	Practical Credits	2
Content of Practical			
1. Qualitative analysis for carbohydrates-Glucose, Fructose, Maltose, Lactose, Sucrose, Starch and Galactose 2. Qualitative test for minerals 2. Quantitative analysis in of glucose 3. Quantitative analysis of Cholesterol 4. Quantitative analysis in blood and serum- Urea 5. Enzymes–effect of PH on human salivary α -amylase activity			

Pedagogy

Formative Assessment	
Assessment Occasion/type	Weightage in Marks
Test1	05
Practical Record	03
Participation and Involvement	02
Total	10Marks

References
- Gropper, S. S. & Smith, J. L. – Advanced Nutrition and Human Metabolism (8th ed., 2021). - Stipanuk, M. H. & Caudill, M. A. – Biochemical, Physiological, and Molecular Aspects of Human Nutrition (2018). - Lanham-New, S. A. et al. – Nutrition and Metabolism (2011). - Gibney, M. J. et al. – Introduction to Human Nutrition (2020). - Malik, D. et al. – Textbook of Nutritional Biochemistry (2023). - Jain JL (2012) Fundamentals of Biochemistry, S. Chand and Company Ltd.

Program Name	BSc Food Nutrition and Dietetics	Semester	Fifth Semester
Course Title	Diet Counseling (Theory)		
Course Code:		No. of Theory Credits	3
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s):Diploma with minimum 45%

Course Outcomes:

After the successful completion of the course, the student will be able to:

- CO 1. Understand the principles of nutritional or dietary counselling.
- CO 2. Gain knowledge about the arts and skills of a Counsellor.
- CO 3. Apply the use of computers to collate and analyse information.
- CO 4. Demonstrate diet counselling techniques to facilitate behaviour change and lifestyle modification

Course objectives:

- Use active listening and interviewing skills.
- Conduct comprehensive client dietary assessments.
- Identify and overcome patient lifestyle barriers.
- Create clear, accessible nutrition education materials.

Content of Theory	36 Hrs
Unit-1	09
Nutrition counselling- Definition, expectations, goals, scope and limits. Principles and objectives of nutrition counseling. Practical consideration in giving dietary advice and counselling - Factors affecting and individual food choice, Communication of dietary advice, Consideration of behavior modification, motivation.	
Unit-2	09
Dietitian- Code of ethics, responsibilities. The Counselling Process-Techniques for obtaining relevant information-Clinical Information, Medical History and General Profile, nutritional assessment	
Unit-3	09
Dietary counselling - Assessing food and nutrient intakes, Lifestyles, physical activity, stress. Implementation - Counselling the client/patient – client concurrence, co-ordination of care plans- the provision of learning experience. Evaluation-Measuring the success of performance of client and evaluating the counselling process.	

Unit-4	09
Computer application - Use of computers by dietitian, dietary computations, dietetic management, education/training, information storage and administration, Research, Execution of software packages. Straight line, frequency table, bar diagram, pie chart, Preparation of Dietary charts for patients.	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test2	05
Assignment/Seminar	05
Project	05
Total	20Marks

References
- Bauer, K. D., & Liou, D. (2021). Nutrition Counseling and Education Skill Development (4th ed.). Cengage Learning. ISBN: 9780357367667. - Holli, B. B., & Beto, J. A. (2014). Nutrition Counseling and Education Skills for Dietetics Professionals (6th ed.). Lippincott Williams & Wilkins. ISBN: 9781451120387. - Beto, J. A. (2024). Nutrition Counseling and Education Skills: A Practical Guide (8th ed.). Jones & Bartlett Learning. ISBN: 9781284283983. - Raymond, J. L., & Morrow, K. (2023). Krause and Mahan's Food and the Nutrition Care Process (16th ed.). Elsevier. ISBN: 9780323810258.

Program Name	BSc Food Nutrition and Dietetics	Semester	Fifth Semester
Course Title	Food Packaging and labelling (Theory)		

Course Code:		No. of Theory Credits	3
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s): Degree with minimum 45%

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO 1. Understand requirements and types of food packaging
- CO 2. Know about recent trends in packaging materials and labeling.
- CO 3. Develop insights into biodegradable and aseptic food packaging
- CO 4. Become skilled in labelling standards and regulations

Course objectives:

- Select appropriate materials for food protection.
- Apply active packaging to extend shelf-life.
- Design labels that meet regulatory standards.
- Calculate and format nutrition facts panels.

Content of Theory	36 Hrs
Unit-1	09
Food packaging Definition, functions of packaging materials for different foods, characteristics of packaging material. Food packages – bags, pouches, wrappers, tetra packs-applications. Packaging materials- Introduction, purpose, requirements, and types of containers. Modern packaging materials and forms-Glass containers, metal cans, composite containers, aerosol containers, rigid plastic packages, semi rigid packaging, and flexible packaging.	
Unit-2	09
Packages of radiation stabilized foods Introduction, rigid containers, flexible containers, general methods for establish in radiation stabilization. Radiation-measurement of radiations. Biodegradable packaging material – biopolymer based edible firm. Packages of dehydrated products Orientation, metallization, co-extrusion of multilayer films, stretch, package forms and techniques.	
Unit-3	09
Aseptic packaging, retortable containers, modified and controlled atmosphere packaging, skin, shrink and cling film packaging, micro-ovenable containers, other package forms and components of plastics. Packaging of finished goods Weighing, filling, scaling, and wrapping, cartooning, labelling, marking and trapping.	
Unit - 4	09

Labelling: Definition, objectives, and importance of food labelling, Standards, purpose, specifications, description types of labels, labelling regulation, bar code, nutritional Labelling, health claims, export and import policy of labelling and mandatory labelling provision
 Package testing and evaluation methods, Quality control and quality assurance in food packaging, Shelf-life studies and storage stability of packaged foods, Environmental concerns and sustainable packaging.

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test 2	05
Assignment/Seminar	05
Project	05
Total	20Marks

References
• Coles, R., McDowell, D., & Kirwan, M. J. (2003). Food Packaging Technology. Blackwell Publishing/CRC Press. ISBN: 9781841272214. • Coles, R., & Kirwan, M. J. (2011). Food and Beverage Packaging Technology (2nd ed.). Wiley-Blackwell. ISBN: 9781405189101. • Lee, D. S., Yam, K. L., & Piergiovanni, L. (2008). Food Packaging Science and Technology. CRC Press. ISBN: 9781439890196. • Yam, K. L. (Ed.). (2009). The Wiley Encyclopedia of Packaging Technology (3rd ed.). John Wiley & Sons. ISBN: 9780470087046.

Program Name	BSc Food Nutrition and Dietetics	Semester	Fifth Semester
Course Title	Food product development and sensory analysis (Theory)		
Course Code:		No. of Credits	3
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours

Formative Assessment Marks	20	Summative Assessment Marks	80
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Course Pre-requisite(s):Diploma withminimum45%	
Course Outcomes: After the successful completion of the course, the student will be able to: CO 1. To apply knowledge to assess consumers' food preferences and choices CO 2. To design processes to improve existing products or new products CO 3. To understand the knowledge base for product development CO 4. To evaluate produced foods based on sensory evaluation of foods Course objectives: • Formulate a new food product prototype. • Run discriminative and consumer sensory tests. • Use statistical data to improve recipes. • Evaluate product stability and commercial scaling.	
Content of Theory	36 Hrs
Unit-1	09
New Product Development (NPD): Concept, importance, and scope of food product development, The Stage-Gate model NPD success factors, new product design, food innovation case studies, market-oriented NPD methodologies, organization for successful NPD; Recipe Development; use of traditional recipe and modification; involvement of consumers, chefs and recipe experts; selection of materials/ingredients for specific purposes; modifications for production on large scale, cost effectiveness and return on investment, nutritional needs or uniqueness; use of novel food ingredients and novel processing technologies.	
Unit-2	09
Process design, equipment needed; establishing process parameters for optimum quality; Lab requirements; different techniques and tests; statistical analysis; application in product development and comparison of market samples; stages of the integration of market and sensory analysis, TQM's in NPD.	
Unit-3	09
Market research and consumer needs assessment, Role of innovation and entrepreneurship in food product development, Product prototyping and optimization, Quality and safety considerations in product development. Development of functional, convenience, and value-added food products	
Unit-4	09

Sensory Evaluation: Introduction, Development of Sensory Evaluation, Defining Sensory Evaluation, A Physiological, anatomical and Psychological Perspective. Sensory evaluation: Selection of sensory panelists; Factors influencing sensory measurements; Sensory quality parameters -Size and shape, texture, aroma, taste, color and gloss; Detection, threshold and dilution tests. Different tests for sensory evaluation–discrimination, descriptive, affective; Flavor profile and tests; Ranking tests; Methods of sensory evaluation of different food products. Computer-aided sensory evaluation of food & beverage, statistical analysis of sensory data

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test2	05
Assignment/Seminar	05
Project	05
Total	20Marks

References
• Lawless, H. T., & Heymann, H. (2010). <i>Sensory evaluation of food: Principles and practices</i> (2nd ed.). Springer. • Meilgaard, M. C., Carr, B. T., & Civille, G. V. (2016). <i>Sensory evaluation techniques</i> (5th ed.). CRC Press. • Aaron, A. M., & MacFie, H. J. (Eds.). (2007). <i>Developing new food products for a changing marketplace</i> (2nd ed.). Woodhead Publishing. • Moskowitz, H. R., Beckley, J. H., & Resurreccion, A. V. (2012). <i>Sensory and consumer research in food product design and development</i> (2nd ed.). Wiley-Blackwell. • Earle, M., & Earle, R. (Eds.). (2008). <i>Case studies in food product development</i>. Woodhead Publishing. • Graf, E., & Saguy, I. S. (Eds.). (1991). <i>Food product development: From concept to the marketplace</i>. Van Nostrand Reinhold.

Program Name	BSc Food Nutrition and Dietetics		Semester	Fifth Semester
Course Title	Specialized diet formulation and its nutritional evaluation Skill/Practical based compulsory course			
Course Code:			No. of Credits	2
Contact hours	24hrs		Duration of ESA/Exam	-
Formative Assessment Marks		10	Summative Assessment Marks	40
Course Pre-requisite(s):Certificate with minimum45%				

Course Outcomes:

After the successful completion of the course, the student will be able to:

CO 1. Understand principles of specialized diet planning for different age groups, physiological conditions and diseases and formulate them

CO 2. Apply knowledge of nutrients and food composition to design balances and customized meal plans

CO3. Assess the nutritional status using dietary assessment methods and interpret dietary data

CO4. Develop skills in modifying recipes and diets, also learn to counsel the individuals

Course objective:

- To understand the nutritional requirements of different population groups and individuals with specific health conditions.
- To formulate specialized diet products using appropriate ingredients and processing techniques to meet targeted nutritional needs.
- To evaluate the nutritional quality and acceptability of formulated diet products through standard assessment methods.
- To apply principles of food safety, quality control, and nutritional labeling in the development

of specialized diet products.

Content of Theory	24Hrs
SPECIALIZED DIET PRODUCT FORMULATION AND NUTRITIONAL EVALUATION	
Diet formulation and evaluation: Students are supposed to take up specialized dietary conditions and formulate a product/New product based on the condition and undergo nutritional evaluation of the product, which may manage or cure that particular condition. Assessment: Based on the survey and the assessment carried out by the students and the presentation and viva voce, as mentioned above.	

SEMESTER VI

Program Name	BSc Food Nutrition and Dietetics	Semester	Sixth Semester
Course Title	Therapeutic Nutrition II (Theory + Practical)		
Course Code:		No. of Theory +Practical Credits	3+2
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s):Certificate with minimum 45%

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1 Understand the modifications of normal diet for therapeutic purposes by applying principles of diet therapy to cardiovascular diseases

CO2 Formulate dietary management for cancer after thorough understanding of cancer progression

CO3 Prepare diets for specific genetic and metabolic disorders

CO4 Evolve dietary management approaches for neurological disorders

Course objective:

- To acquire knowledge of dietary modifications required for various clinical conditions.
- To develop skills in planning and evaluating therapeutic diets for individuals across different age groups.
- To understand the role of nutrients in disease management and recovery.
- To apply nutritional assessment techniques for providing appropriate dietary recommendations

Content of Theory	36 Hrs
Unit-1	09

Diseases of the Cardiovascular system: Definition of coronary heart disease (CHD) – Clinical features and Risk factors - modifiable and non-modifiable. Common disorders of Coronary heart disease: Dyslipidaemia / hyperlipidaemia / hypercholesterolemia - Definition, classes of lipoproteins and other parameters in CHD, aetiology, symptoms - xanthoma, complications. Dietary management-objectives, macronutrients, micronutrients, and foods allowed/ not allowed. Atherosclerosis - Definition, aetiology, Role of fat in the development of atherosclerosis -Cholesterol, Saturated fatty acids, Trans fatty acids, Physical activity and heart diseases, Functional foods. Dietary guidelines. Hypertension: Definition, classification and stages. Pathogenesis, aetiology, symptoms, complications. Dietary management-objectives, macronutrients, micronutrients, foods allowed/ not allowed, High and low sources of sodium. Lifestyle modifications to manage hypertension; Dietary Approach to Stop Hypertension(DASH)	
Unit-2	09
Cancer: Definition, Steps in development of cancer, characteristics of cancer, tumours -benign and malignant. Classification of malignant tumours. Risk factors, dietary and non-dietary factors. Symptoms of specific cancers. Metabolic alterations and its associated nutritional problems. Carcinogenic foods. Role of food in the prevention of cancer. Nutrition problems of cancer therapy. Feeding problems in cancer patients. Dietary management -objectives, macronutrients, micronutrients.	
Unit-3	09
Genetic disorders: Galactosemia (In born errors of metabolism) – Definition, metabolic changes, diagnosis, Aetiology and dietary management- objectives, macronutrients, micronutrients, galactose containing foods and low galactose foods. Phenylketonuria (PKU) - Definition, aetiology, metabolic changes, diagnosis, Prognosis, Dietary management-objectives, macronutrients, micronutrients, low phenylalanine foods, PKU formulae.	
Unit-4	09
Metabolic and neurological disorders: Neurologic disorders- nutritional and non-nutritional. Epilepsy – definition, aetiology, clinical features. Dietary Management-Ketogenic diet-mechanism of the diet, short term and long term side effects, foods allowed and not allowed, medical nutrition support in critical illness: types and modes, Nutrition care plan. Definition of metabolic disorders. Gout-definition, aetiology, metabolic changes, clinical features and symptoms, Dietary management-objectives, macronutrients, micronutrients, foods allowed/not allowed	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test2	05
Assignment/Seminar	05

Project	05
Total	20Marks

Course Title	Therapeutic Nutrition - II(Practical)	Practical Credits	2
Content of Practical			
Planning, preparing, screening and analyzing the risk strategies with disease specific conditions and establishing a therapeutic nutritional support for the following case			
1. Cardiovascular diseases-atherosclerosis 2. Dyslipidaemia 3. Hypertension 4. Cancer 5. Phenylketonuria 6. Galactosemia 7. Epilepsy 8. NCP – Nutritional assessment, nutritional diagnosis, nutritional interventions and monitoring and evaluation.			

Pedagogy

Formative Assessment	
Assessment Occasion/type	Weightage in Marks
Test1	05
Practical Record	03
Participation and Involvement	02
Total	10Marks

References
- SrilakshmiB (2011)Dietetics,6thEd.,NewAgeInternational Publ.,New - Mahan, L. K., Raymond, J. L., & Escott-Stump, S. (2024). Krause's food and the nutrition care process (16th ed.). Elsevier. - Antia, F. P., & Abraham, P. (2002). Clinical dietetics and nutrition (4th ed.). Oxford University Press. - Nix, S. (2021). Williams' basic nutrition and diet therapy (16th ed.). Elsevier. - Sharma, A. (2026). Principles of therapeutic nutrition and dietetics (2nd ed.). CBS Publishers &

Distributors

Program Name	BSc Food Nutrition and Dietetics	Semester	Sixth Semester
Course Title	Food Preservation - II (Theory + Practical)		
Course Code:		No. of Theory Credits	3
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s):Diploma with minimum 45%

Course Outcomes:

After the successful completion of the course, the student will be able to:

- CO1. Learn the concept of malnutrition and nutritional epidemiology
- CO2. Understand major nutritional problems prevalence, prevention and control
- CO3. Understand policies and programs to combat community nutrition
- CO4. Know the role of organizations working towards combating malnutrition.

Course objectives:

- To study various traditional and modern methods of food preservation.
- To gain knowledge of microbial, chemical, and physical factors affecting food spoilage.
- To develop skills in selecting suitable preservation techniques for different food products.
- To understand food safety, quality control, and regulatory aspects related to preserved food

Content of Theory	36 Hrs
Unit-1	09
Types of heating: Conduction and convection heating. Microwave heating – advantages and disadvantages. Preservation of semi-moist foods / intermediate moist foods. Non-thermal Processing- Definition, principles, application, merits and demerits of Ohmic heating, Infrared heating, High pressure processing, Pulsed electric field. Hurdle Technology-Principles, application, advantages and disadvantages	
Unit-2	09

Preservation by use of low temperature: Refrigeration: Definition, general principles, selection of refrigerant. Chilling injury to food approaches to control chilling injury. Freezing: Definition, general principles, advantages of frozen fruits and vegetables, limitations, methods of freezing, pre-treatment prior to freezing, air freezing, indirect freezing, direct contact freezing, immersion freezing, ice formation. Selection and preparation of foods for freezing. Changes during freezing, Freezer burn. Thawing. Effects of freezing on nutritive value.

Unit-3

09

Preservation by use of high temperature: High temperature: Effect of heat on texture, composition- nutrient and microbial. Definition, methods, advantages and disadvantages– Blanching, pasteurization and sterilization. Canning – definition, General principles, steps in canning / bottling of any one fruit and vegetable, Advantage and disadvantages of canning, Storage of canned foods. Process evaluation, thermal death time and heat penetration

Unit - 4

09

Packaging and storage of preserved foods: Role and functions of packaging in preservation, packaging materials and systems, modified atmosphere packaging (MAP), controlled atmosphere packaging (CAP), storage conditions and shelf life studies of foods, quality evaluation of preserved food, recent trends in food preservation technologies.

Pedagogy

Formative Assessment:

Assessment Occasion/type	Weightage in Marks
Test1	05
Test2	05
Assignment/Seminar	05
Project	05
Total	20 Marks

References

- Frazier, W. C., & Westhoff, D. C. (2008). Food Microbiology (4th ed.). Tata McGraw-Hill.
- Rahman, M. S. (2015). Principles of Food Preservation.
- Jha, S. N. (2018). Food Preservation and Safety of Natural Products

- Johnson R, Anderson MT (2012) Food Preservation,
- Manay NS, Shadaksharaswamy M (2010) Foods - Facts and principles, New Age International Publ., New Delhi

Course Title	Food Preservation - II(Practical)	Practical Credits	2
Content of Practical			
• To estimate the lactic acid in milk • Iodometric estimation of milk lactose • Prepare and preserve the following: Tutti frutti, ketchups & sauces, Chutneys, Chutney powder, Frozen fruits and vegetables • Effect of freezing/Refrigeration on shelf life of fruits and vegetables • Effect of blanching on vegetables • Preservation of food using different packaging material • Sampling of food handlers			

Pedagogy

Formative Assessment	
Assessment Occasion/type	Weightage in Marks
Test1	05
Practical Record	03
Participation and Involvement	02
Total	10Marks

Program Name	BSc Food Nutrition and Dietetics	Semester	Sixth Semester
Course Title	Nutritional Biochemistry – II (Theory+ Practical)		
Course Code:		No. of Theory Credits	3
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s): Certificate with minimum 45%

Course Outcomes:

After the successful completion of the course, the student will be able to:

- CO 5. Obtain an insight into the biochemistry of major nutrients and physiologically important compounds such as proteins and hormones
- CO 6. Understand the principles of biochemistry (as applicable to human nutrition).
- CO 7. Appreciate types and changes in protein structure and associated malnutrition
- CO 8. Comprehend the role of vitamins and minerals and associated disorders

Course objectives:

- To study the metabolic pathways involved in nutrient utilization and energy production.
- To understand the biochemical basis of nutrition-related disorders and deficiencies.
- To develop knowledge of enzyme functions, hormonal regulation, and their role in metabolism.
- To apply biochemical principles in understanding the relationship between nutrition, health, and disease

Content of Theory	36 Hrs
Unit-1	09
Proteins – Amino acids, chemical bonds (peptide, ionic, hydrogen bonds, van der Waal's forces and hydrophobic interactions) involved in protein structure, Protein configuration – primary, secondary, tertiary and quaternary structures with suitable examples, biological role of proteins. Biosynthesis, protein digestion and absorption, protein malnutrition.	
Unit-2	09
Nucleic acids: Introduction, components, nucleosides, nucleotides - DNA, base composition, double helical structure, DNA – Denaturation, DNA replication mechanism, DNA Repair Mechanisms, Transcription – requirements and mechanism. RNA – Types, structure and functions	

Unit-3	09
Hormones: classification, structure and Biological role of hormones of hypothalamic and pituitary, adrenal Cortex and Medulla, Thyroid Parathyroid and Pancreas, hormones of gonads	
Unit-4	09
Vitamins: Chemistry and biochemical role of fat soluble vitamins – A,D,E and K. Water soluble vitamins B1,B2, B3, B6 and C. Storage of vitamins in the body, daily human requirements, deficiency disorders. Minerals: Biochemical role of inorganic elements, deficiency disorders.	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test2	05
Assignment/Seminar	05
Project	05
Total	20Marks

References
• Lanham-New, S. A. et al. – Nutrition and Metabolism (2011). • Gibney, M. J. et al. – Introduction to Human Nutrition (2020). • Malik, D. et al. – Textbook of Nutritional Biochemistry (2023). • U Satyanarayana, U Chakrapani (2013) 4th revised edition, Biochemistry, ISBN, New Delhi, Elsevier, pvt, Ltd. • Jain JL (2012) Fundamentals of Biochemistry, S.Chand and Company Ltd.

Course Title	Nutritional Biochemistry – II (Practical)	Practical Credits	2
Content of Practical			
1. Quantitative analysis for proteins- Biurete test, lowry's method 2. Quantitative analysis – Serum inorganic phosphate, Serum protein, Creatinine in urine			

- | |
|---|
| <ol style="list-style-type: none">3. Estimation of Ascorbic acid content of foods by colorimetric/titrimetric method4. Estimation of DNA and A/G ratio5. Quantitative estimation of calcium, phosphorous, iron. |
|---|

Pedagogy

Formative Assessment	
Assessment Occasion/type	Weightage in Marks
Test1	05
Practical Record	03
Participation and Involvement	02
Total	10Marks

Program Name	BSc Food Nutrition and Dietetics	Semester	Sixth Semester
Course Title	Functional Foods and Nutraceuticals (Theory)		
Course Code:		No. of Theory Credits	3
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s): Degree with minimum 45%

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- CO1 Understand the health benefits of primary and secondary metabolites
- CO2 Comprehend the role of nutraceuticals and prioritize their inclusion in menu planning
- CO3 Understand antioxidants and their role in health management
- CO4 Assess role of functional foods, pro, pre and syn-biotics

Course objectives:

- Classify bioactive compounds and food phytochemicals.
- Examine how functional foods prevent disease.
- Evaluate supplement safety and scientific evidence.
- Navigate health claim legal regulations.

Content of Theory	36 Hrs
Unit-1	09
Concept, definition, and scope of functional foods and nutraceuticals, History and development of functional foods. Classification of functional foods and nutraceuticals, Relationship between diet, health, and disease prevention. Global and Indian perspectives on functional foods, primary metabolites– pigments, sources, classification, functions, flavor and odor components: Pheromones, fatty acids and structural lipids. Secondary metabolites: alkaloids, terpenoids, glycosides, natural phenols–resveratrol. Isoprenoid derivatives. Polyphenols – sources, classification and functions.	
Unit-2	09
Bioactive compounds in foods: phytochemicals, antioxidants, dietary fiber, omega-3 fatty acids, and carotenoids. Probiotics, prebiotics, and synbiotics, Functional properties and health benefits of bioactive components, Sources and applications of functional ingredients in food products, Biological effects of commonly used functional foods. Application of nutraceuticals in health care – formulation and its application in health care, role and mechanism, advantages, disadvantages	

and its limitations.	
Unit-3	09
Types and classification of nutraceuticals, Nutraceuticals in the prevention and management of chronic diseases. Functional foods and nutraceuticals for cardiovascular health, diabetes, obesity, and gastrointestinal disorders. Nutraceuticals for immune enhancement and healthy aging, Safety, efficacy, and quality considerations of nutraceutical products, Nutritional evaluation and quality assessment. Regulatory aspects and health claims. Food Safety and Standards Authority of India (FSSAI) guidelines.	
Unit - 4	09
Functional Foods: millets, infant formula, fiber rich foods, beverages, herbal foods, probiotic foods—sources and health benefits. Antioxidants: sources, classification and functions; Antioxidant paradox. Definition, characteristics, spectrum of activity, health claim, dosage, safety and role as functional ingredient with examples of Prebiotics, Probiotics and Synbiotics. Functional dairy foods: Bioactive peptide-definition, sources; probiotic and bioactive peptide based functional foods. Nutritional evaluation and quality assessment, Regulatory aspects and health claims, Food Safety and Standards Authority of India (FSSAI) guidelines, Emerging trends, innovations, and future prospects in functional foods and nutraceuticals.	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test 2	05
Assignment/Seminar	05
Project	05
Total	20Marks

References
- Wildman, R. E. C., & Kelley, M. (Eds.). (2019). <i>Handbook of functional foods and nutraceuticals</i> (3rd ed.). CRC Press. - Vattem, D. A., & Maitin, V. (Eds.). (2016). <i>Functional foods, nutraceuticals and natural products: Concepts and applications</i>. DEStech Publications, Inc. - Gupta, V. K., Treichel, H., Shapaval, V., Oliveira, L. A. de, & Tuohy, M. G. (Eds.). (2018).

Microbial functional foods and nutraceuticals. John Wiley & Sons.

- Egbuna, C., & Dable Tupas, G. (Eds.). (2020). *Functional foods and nutraceuticals: Bioactive components, formulations and innovations*. Springer International Publishing.
- Mine, Y., & Jiang, B. (Eds.). (2010). *Bioactive proteins and peptides as functional foods and nutraceuticals*. Wiley-Blackwell.

Program Name	BSc Food Nutrition and Dietetics		Semester	Sixth Semester
Course Title	Community Nutrition (Theory)			
Course Code:		No. of Theory Credits	3	
Contact hours	36 hrs		Duration of ESA/Exam	2 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80	

Course Pre-requisite(s):Diploma with minimum 45%

Course Outcomes:

After the successful completion of the course, the student will be able to:

- CO1. Learn the concept of malnutrition and nutritional epidemiology
- CO2. Understand major nutritional problems prevalence, prevention and control
- CO3. Understand policies and programs to combat community nutrition
- CO4. Know the role of organizations working towards combating malnutrition.

Course objectives:

- Analyze economic factors affecting food security.
- Conduct localized community needs assessments.
- Deliver culturally sensitive nutrition workshops.
- Partner with local agencies for program success.

Content of Theory			36 Hrs
Unit-1			09
Concept, scope, objectives, and significance of community nutrition. Relationship between nutrition, health, and socio-economic development. Nutritional problems in India and developing countries. Determinants of nutritional status: social, cultural, economic, environmental, and dietary factors. Malnutrition – under nutrition, over nutrition, and hidden hunger. Public health significance of nutrition. Role of community nutritionists and dieticians in public health. Nutrition transition and emerging nutritional challenges			

Unit-2	09
Concept and objectives of nutritional assessment. Anthropometric assessment: height, weight, BMI, growth monitoring, and growth charts. Clinical assessment of nutritional deficiencies. Biochemical and dietary assessment methods. Community nutritional surveys and surveillance. Principles, methods, and tools of nutrition education. Communication techniques for nutrition education and behavior change. Development, implementation, and evaluation of nutrition education programs. Information, Education, and Communication (IEC) materials and their applications	
Unit-3	09
National Nutrition Policy and National Health Policy. Integrated Child Development Services (ICDS): objectives, components, and impact. Poshan Abhiyaan and its role in improving nutritional status. Mid-Day Meal Scheme: objectives, implementation, and evaluation. Public Distribution System (PDS) and food security. Supplementary nutrition programmes for vulnerable groups. Micronutrient deficiency control programmes: Vitamin A, Iron and Folic Acid, and Iodine supplementation. Role of governmental and non-governmental organizations in nutrition interventions. Monitoring and evaluation of community nutrition programmes.	
Unit - 4	09
Nutritional needs and problems of infants, preschool children, school-age children, and adolescents. Maternal nutrition: nutritional care during pregnancy and lactation. Nutrition for the elderly and special population groups. Prevention and management of protein-energy malnutrition (PEM). Prevention and control of micronutrient deficiencies. Food and nutrition security: concepts, challenges, and strategies. Community-based nutrition interventions and participatory approaches. Nutrition counselling and health promotion at the community level. Current trends and emerging issues in community nutrition.	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test 2	05
Assignment/Seminar	05
Project	05
Total	20Marks

References

- Contento, I. R., & Koch, P. A. (2021). *Nutrition education: Linking research, theory, and practice* (4th ed.). Jones & Bartlett Learning.
- Gibney, M. J., Margetts, B. M., Kearney, J. M., & Arab, L. (Eds.). (2004). *Public health nutrition*. Wiley-Blackwell.
- Steyn, N. P., & Temple, N. J. (Eds.). (2015). *Community nutrition for developing countries*. Athabasca University Press & Unisa Press.
- Lawrence, M., & Worsley, T. (Eds.). (2020). *Public health nutrition: From principles to practice* (2nd ed.). Routledge.
- Nnakwe, N. E. (2018). *Community nutrition: Planning health promotion and disease prevention* (3rd ed.). Jones & Bartlett Learning.
- Boyle, M. A. (2021). *Community nutrition in action: An entrepreneurial approach* (8th ed.). Cengage Learning.

Program Name	BSc Food Nutrition and Dietetics	Semester	Sixth Semester
Course Title	Food for Health (Theory)		
Course Code:		No. of Credits	3
Contact hours	36 hrs	Duration of ESA/Exam	3 Hours
Formative assessment Marks	20	Summative Assessment Marks	80

Course Pre-requisite(s): Degree with minimum 45%

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO 1: Know the composition of various foods.

CO 2: Understand the effects of cooking on nutritive value.

Course objective:

- Evaluate how whole diets improve wellness.
- Tailor dietary advice to lifecycle stages.
- Link food diversity to microbiome health.
- Translate complex science into clear food advice.

Content of Theory	36 Hrs
Unit-1	09
Definition of health, food, Nutrition, Functions of food, food guide based on updated food guide system (ICMR 2020). Healthy method of cooking, loss of nutrients during cooking.	

Role of dietary fibre in health promotion, current trends in healthy food industry- organic, plant based, gluten free, fortified and enriched foods.	
Unit-2	09
Introduction to super foods- Definition, characteristics and concept of “super foods”. Nutritional and therapeutic significance, traditional vs modern super foods. Super foods by food groups – cereals and millets: quinoa, amaranth, finger millet (ragi, oats- nutritional profile and health benefits Pulses and legumes- role of soybean, lentil, chickpeas, kidney beans in protein quality improvement and chronic disease prevention	
Unit - 3	09
Super fruits – Phytochemicals, antioxidants and disease preventive roles of blueberries, pomegranate, amla and banana. Super vegetables – micronutrient richness and role in immunity – spinach, kale, broccoli, carrots , beetroot Nuts and oilseeds – role of almonds, walnuts, flax seeds, chia seeds, sesame seeds in cardio vascular health	
Unit - 4	09
Animal foods – protein quality in fatty fishes (salmon, sardine, mackerel), probiotics in yoghurt and micronutrient content in eggs Spices and condiments – bioactive compounds and role in traditional medicine of turmeric, ginger, garlic and cinnamon Market trends and commercialization of super foods	

Pedagogy

Formative Assessment:	
Assessment Occasion/type	Weightage in Marks
Test1	05
Test2	05
Assignment/Seminar	05
Project	05
Total	20Marks

References
Geissler, C., & Powers, H. (2005). Human Nutrition (11th ed.). Elsevier Churchill Livingstone. ISBN: 9780443073564.

- Anderson, J. J. B. (2005). Nutrition and Health: An Introduction. Carolina Academic Press. ISBN: 9780890893654.
- Wiseman, G. (Ed.). (2002). Nutrition and Health. Routledge. ISBN: 9780415278751.
- Blades, M. (2005). Intermediate Nutrition & Health: An Introduction to the Subject of Food, Nutrition and Health (2nd ed.). Highfield Publications. ISBN: 9781904544432.

INTERNSHIP

