SNDT Women's University, Mumbai

B.Sc. (Food Science Nutrition- Nutrition & Dietetics)

2023

Nomenclatures Across Levels:

Level	Semester	Name of the Level	Credits	Nomenclature
4.5	1	Certificate	22	UG Certificate in Food & Nutrition
	2		22	
5.0	3	Diploma	22	UG Diploma in Food & Nutrition
	4		22	
5.5	5	Degree	22	B.Sc. (Food Science Nutrition-Nutrition & Dietetics)
	6		22	
6.0	7	Honors	22	B.Sc. Honors (Food Science Nutrition-Nutrition & Dietetics)
	8		22	

B.Sc. (Food Science Nutrition- Nutrition & Dietetics)

Programme Degree		**B.Sc.**
Faculty		Science & Technology
Specialization Major		**Food Science Nutrition**
Sub-Specialization		**(Nutrition & Dietetics)**
Preamble		The Program lays a strong emphasis on a multidisciplinary, integrated approach that will enable students to build a variety of skills and a broad base of professional knowledge in the areas of food science, nutrition and dietetics. It encourages the development of scientific perspectives and a research attitude in students. The programme trains learners in exploring areas of human physiology, biochemistry, nutrition, and medical nutrition therapy and their relationships. At the end of the programme, learner will be able to work in varied sectors of food and nutrition, dietetics, nutrition education work government, non-government, research or learning organizations.
Programme Specific Outcomes		After completing this programme, Learner will -
	1.	Classify the composition of various foods and their relation to therapeutic conditions.
	2.	Identify the changes that take place due to food processing.
	3.	Comprehend the fundamentals of human physiology, biochemistry, nutrition, and medical nutrition therapy and their relationships.
	4.	Educate people of all ages, groups and plan healthy diets.
	5.	Design nutrition education material and provide nutrition counseling to healthy and disease conditions.
Eligibility Criteria for Programme		Any woman who has successfully cleared 10+2 from the recognized Boards in Home Science/Science of study by the Government of India/respective state or have required credits as per the government norms to be able to join undergraduate programme. Student having cleared Arts with Home Science is also eligible.

B.Sc. (Food & Nutrition-Nutrition and Dietetics)

Syllabus Structure for Four Years

	Courses	Type of Course	Credits	Marks
Semester I				
1.1	Basics of Food Science (Theory)	Major (Core)	4	100
1.2	Basics of Food Science (Practical)	Major (Core)	2	50
1.3	Applied Science (Th + Pr)	OEC	4	100
1.4	Cuisines of India (Theory) FOR OTHER MAJORS/ Courses to be ADDED from other Majors	VSC	2	50
1.5	English	SEC	2	50
1.6	Effective Spoken Communication	AEC	2	50
1.7	Cuisines of India (Theory)	IKS	2	50
1.8	EVS (Th)	VEC	2	50
1.9	NSS/NCC/CHETNA/Cultural	CC	2	50
			22	**550**
Semester II				
2.1	Basics of Nutrition (Theory)	Major (Core)	4	100
2.2	Basics of Nutrition (Practical)	Major (Core)	2	50
2.3	Food Hygiene & Sanitation	Minor Stream	2	50
2.4	Human Physiology	OEC	4	100
2.5	Cuisines of India (Pr.) FOR OTHER MAJORS/ Courses to be ADDED from other Majors	VSC	2	50
2.6	English	SEC	4	50
2.7	Effective Written Communication	AEC	2	50
2.8	Cuisines of India (Practical)	IKS	2	50
2.9	NSS/NCC/CHETNA/Cultural	CC	2	50
			22	**550**
		TOTAL	**44**	**1100**
10 Credits Practical - One Batch of 15 Students			**10**	**250**
UG CERTIFICATE in Food &Nutrition			**54**	**1350**

UG Structures and First Year Syllabi of Food Science & Nutrition were approved in the Academic Council of 22-11-2023.

SN	Courses	Type of Course	Credits	Marks
Semester III				
3.1	Basic Biochemistry	Major (Core)	4	100
3.2	Food Microbiology	Major (Core)	4	100
3.3	Nutrition through Life Span	Minor Stream	4	100
3.4	Introduction to Food Preservation	OEC	2	50
3.5	Introduction to Food Preservation FOR OTHER MAJORS/ Courses to be ADDED from other Majors	VSC	2	50
3.6	SEMINAR/ ENGLISH	AEC	2	50
3.7	Nutrition Assessment in Community	FP	2	50
3.8	NSS/NCC/CHETNA/Cultural	CC	2	50
			22	**550**
Semester IV				
4.1	Biochemistry	Major (Core)	4	100
4.2	Medical Nutrition Therapy I	Major (Core)	4	100
4.3	Nutrition Assessment Techniques	Minor Stream	4	100
4.4	Food Product Development & Labeling	OEC	2	50
4.5	Food Product Development & Labeling (FOR OTHER MAJORS) Courses to be ADDED from other Majors	VSC	2	50
4.6	SEMINAR/ ENGLISH	AEC	2	50
4.7	NSS/NCC/CHETNA/Cultural	CC	2	50
4.8	Project	CEP	2	50
			22	**550**
		TOTAL	**44**	**1100**
10 Credits Practical - One Batch of 15 Students			**10**	**250**
UG DIPLOMA IN FOOD & NUTRITION			**98**	**2450**

SN	Courses	Type of Course	Credits	Marks
Semester V				
5.1	Human Nutrition -I	Major (Core)	4	100
5.2	Medical Nutrition Therapy -II	Major (Core)	4	100
5.3	Patho Physiology	Major (Core)	2	50
5.4	Nutrition Exercise & Fitness	Major (Elective)	4	100
5.5	Institutional Food Service Management (THEORY AND PRACTICAL)	Minor Stream	4	100
5.6	Nutrition Exercise & Fitness (FOR OTHER MAJORS) Courses to be ADDED from other Majors	VSC	2	50
5.7	Project	CEP	2	50
			22	**550**
Semester VI				
6.1	Human Nutrition II	Major (Core)	4	100
6.2	Medical Nutrition Therapy III	Major (Core)	4	100
6.3	Behaviour & Lifestyle Counseling	Major (Core)	2	50
6.4	Public Health Nutrition	Major (Elective)	4	100
6.5	Weight Management	Minor Stream	4	100
6.6	Internship	OJT	4	100
			22	**550**
		TOTAL	**44**	**1100**
B.Sc. (Food Science & Nutrition-Nutrition & Dietetics)			**132**	**3300**

Syllabus Contents

Semester I

1.1 Major (Core)

Course Title	**Basics of Food Science (Th.)**
Course Credits	4
Course Outcomes	After going through the course, learners will be able to
	1. Elaborate the composition of foods and the changes occurring in them during food preparation and storage
	2. Outline the reasons for positive and not so positive changes in foods
	3. Choose the right techniques to plan recipes of high-quality products acceptable to consumers
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Elaborate on the importance of Sensory evaluation, Comprehend and differentiate between different sensory evaluation Techniques
	2. Describe role of water in food preparation, forms of water in food and types of water
Content Outline	• **Sensory characteristics of food** • Importance and objectives of Sensory evaluation and its Prerequisites • Tests for Sensory Evaluation**:** Sensitivity Threshold test Difference test – paired comparison, triangle and Duo-trio test, Rating test – Hedonic, Numerical, Composite scoring and ranking test • **Water:** Role of water in cookery, Forms of water – Bound and free water. Types: Hard and Soft • **Beverages:** Types and Classification.
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Elaborate on the composition of Cereals, Pulses & Legumes, Vegetables and Fruits
	2. Identify the changes occurring in the food components and justify their application in food preparation

Content Outline	• **Cereals:** Structure and composition of a cereal grain, Properties of starch – Thickening and Gelatinization, Gel Formation, syneresis, Retrogradation and Lump formation, Dextrinization, Identity of grains, Gluten formation – Factors affecting Gluten formation. • **Leavening agents:** Natural and Chemical and their action. • **Pulses and legumes**: Composition, anti-nutritional factors, effects, and elimination, soaking, fermentation and germination, • **Vegetable and Fruits:** Composition, color pigments and effect of cooking on them Pectic substances: forms – Pectin, Protopectin, Pectic acid, Pectinic acid. Theory of gel formation, Vegetables gums and their commercial uses.
Module 3 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Describe the composition of Milk, Egg, Meat, Fish, Poul
	2. Identify the changes occurring in the food components and justify their application in food preparation
Content Outline	• **Milk:** Composition, effect of heat, acid, alkali and enzymes on milk, scum formation, maillard reaction • **Egg:** 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**, r**ole of egg in Cookery, methods of cooking egg. • **Meat, Fish and Poultry-**Composition, Structure, post mortem changes, ripening or ageing of meat, tenderization of meat, changes during meat cooking. • **Fish**: Classification, quality indicators of fish, types of fish spoilage, gelatin, and Fish Protein Concentrate (FPC).
Module 4 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Define the functional properties and role of fats and oils and sugars in food preparation
	2. Examine the reasons for spoilage of fats and methods to prevent it

Content Outline	• **Fats and Oils** 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 • **Sugars** Types of Sugars Stages of Sugar cookery Physical Properties-crystalline, amorphous

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

- Market Survey of Types of Beverages.
- Assignment on Types of Minimally processed cereal, Pulses/Legumes and Vegetable.
- Market Survey and discussion on Types of Milk, Milk products.
- Market Survey of Types of Fats, Oils and Sugars.

Bibliography

- Bennion, M. Scheule, B.: (2014): Introductory Foods,14th Edition, Prentice Hall Publications
- Freeland-Graves, J., Peckham, G. C, (1995): Foundations of Food Preparation (6th Edition), Prentice Hall Publishers
- Manay, S. (2020) Foods Facts and Principles, 4th Edition, New Age International Pvt Ltd Publishers
- Potter, N. N., Hotchkiss J. H: (1999), Food Science, 5th Edition, Springer Publications
- Shadaksharaswamy, M, Manay, S, (2020): Food facts and Principles, 4th Edition, New Age International Publishers
- Srilakshmi, B: (2019) Food Science, 8th Edition, New Age International Pvt Ltd Publishers
- Subbulakshmi, G, Udipi, S. A (2021): Food processing and Preservation, 2nd Edition, New Age International Pvt Ltd Publishers

1.2 Major (Core)

Course Title	**Basics of Food Science** (Practical)
Course Credits	**2**
Course Outcomes	After going through the course, learners will be able to
	1. Outline and Examine the nature and composition of food ingredients
	2. Demonstrate the interplay of ingredients during food preparation
	3. Utilize different ingredients in food preparation to create products and assess them using appropriate sensory evaluation tests
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Conduct a variety of Sensory evaluation tests
	2 Observe the changes in sugar and starch in cereals/pulses and vegetables during food Preparation
Content Outline	**Tests for Sensory Evaluation** Sensitivity Threshold test Difference test – paired comparison, triangle and Duo-trio test scoring and ranking test. • **Sugar and Starch Cookery** Preparation of sugar syrups for example: 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. • **Vegetable Cookery** Changes in colour pigments due to heat, acid and alkali
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Develop recipes demonstrating the shortening effect and factors affecting fat absorption
	2 .Prepare milk products and recipes demonstrating the functional properties of eggs

Content Outline	• **Fat Cookery**- Shortening effect and factors affecting fat absorption. • **Milk Cookery**- Paneer, Maillard Reaction • **Egg Cookery-** Role of Egg – Boiled, omelette, French toast, mayonnaise etc.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

- Project on home production of Curds and Cream
- Project on home production of Butter and Ghee

Bibliography

- Bennion, M. Scheule, B.: (2014): Introductory Foods,14th Edition, Prentice Hall Publications
- Freeland-Graves, J., Peckham, G. C, (1995): Foundations of Food Preparation (6th Edition), Prentice Hall Publishers
- Manay, S. (2020) Foods Facts and Principles, 4th Edition, New Age International Pvt Ltd Publishers
- Potter, N. N., Hotchkiss J. H: (1999), Food Science, 5th Edition, Springer Publications
- Shadaksharaswamy, M, Manay, S, (2020): Food facts and Principles, 4th Edition, New Age International Publishers
- Srilakshmi, B: (2019) Food Science, 8th Edition, New Age International Pvt Ltd Publishers
- Subbulakshmi, G, Udipi, S. A (2021): Food processing and Preservation, 2nd Edition, New Age International Pvt Ltd Publishers

1.3 Major (Core)

	Applied Science (Th + Pr)
Course Credits	4 (2+2)
Course Outcomes	After going through the course, learners will be able to
	1. Acquire the basic knowledge of the fundamentals of biological sciences.
	2. Apply the knowledge of the biological processes to nutrition and health.
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify and Differentiate between cells
	2. Comprehend Genetics and it's application
Content Outline	• **Cell** • As the basic unit of life • Types of cells • Salient features of animal cell **Introduction to Micro-organisms** • Bacteria-Structure, Classification based on response to Oxygen, nutrition, Importance of bacteria • Fungi- Morphology of molds and yeasts, classification, beneficial and harmful aspects • Virus- Morphology, Classification based on nucleic acid content and hosts **Genetics and Heredity** • Origin of the term gene • Chemical basis of heredity- organization of human genome, sex determination, monogenic and polygenic traits, patterns of inheritance- autosomal, recessive and sex-linked inheritance • Mutation and its type, abnormalities in chromosome number **Genetic Engineering and Biotechnology** • Definition of the terms • Methodology of gene cloning-in brief Application of genetic engineering in plants- insects & virus resistant plants, plants with improved characters. Application in human medicine- pharmaceuticals, thallessemia oncogenes, interferon, production of growth hormone, human insulin ELISA.

Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1.Differentiate between Functional groups and Organic & Inorganic compounds
	2. Comprehend Drugs and types of drugs
Content Outline	**Review of Basic Chemistry** • Important definitions • Difference between Organic & Inorganic compounds • Functional groups • Bohr's model of atom • Atomic number & electronic configuration • **Drugs and Pharmaceuticals** • Properties of good drug • Meaning of important terms with e.g. Analgesic, Antipyretic, Antacid, Antibiotic, Diuretic, anti-inflammatory, Laxatives, Sulfa drugs • Common drugs- use and side effects of Aspirin, Paracetamol, Sulphanilamide
Module 3 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Have knowledge of various micro-organisms
	2. Have the required skills to study them.
	3. Apply this knowledge in everyday life.
Content Outline	• **Applied Biology** • Study and care of microscope • Observation of motility of bacteria by Hanging drop method (*E.coli* / *Proteus*) • Observation of bacteria by the simple: monochrome staining method (Hay infusion culture or milk) • Gram staining of bacteria in buttermilk • To observe common pathogenic bacteria (any 6 – permanent slides) • Observation of fungi on different food materials • To observe common pathogenic protozoa (permanent slides of *Entamoeba histolytica* and *Plasmodium vivax*) • Study of medicinally important plants
Module 4 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Work systematically in laboratory.
	2. Perform chemical procedures

Content Outline	**Applied Chemistry** • Introduction to chemistry lab & apparatus. • Neutralization of strong acid with strong base (HCl & NaOH) • Neutralization of weak base with strong acid (Na_2CO_3& H_2SO_4) • Neutralization of weak acid with strong base (Oxalic acid & NaOH) • Oxidation- reduction reaction (Oxalic acid & $KMnO_4$) • pH determination of various solutions: acid, base and neutral (two household example for each) Viscosity measurement: water, oil, shampoo by Oswald's viscometer

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Performing the experiments.
- Maintaining a Journal.
- Project on Medicinal Plants.

Bibliography

- George A. (2017): Shreve's Chemical Process Industries, 5th Edition
- Glazer A. Na Ni Baido H (2017) Microbial Biotechnology, 2nd Edition; W.H. Freemen Company.
- K. Venkatraman (1952): The Chemistry of Synthetic Dyes, Vol. I, Academic Press, New York.
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- Loewy A. and Sckevilz (2017) Cell Structure and Functions, Hold, New-York
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- Porter K.R., Bonnevile M.A. (1973) Fine Structure of Cells and Tissues, Lea& Blanchard, Philadelphia.
- Prof. V. A. Shenal (1991): Introduction to the Chemistry of Dyestuffs, sevsk Publications.
- Rao C.V. (1994) Foundation to Mol. Biol, R. Chenda. Co. Publisher
- Thomsen E.G. (1985): Modern Cosmetics Universal publishing corp
- Zhdanov L.S. (1980): Physics for the Technician, MIR Publications. Moscow.

1.4 VOCATIONAL SKILL COURSE

This course will be taken from other Majors.

1.5 SKILL ENHANCEMENT COURSE

This course will be taken opted from the common courses.

1.6 ABILITY ENHANCEMENT COURSE

This course will be taken from the common courses.

1.7 INDIAN KNOWLEDGE SYSTEM COURSE

Course Title	**Cuisines of India (Th.)**
Course Credits	2
Course Outcomes	After going through the course, learners will be able to-
	1.To identify the different cuisines of India
	2.To categorize regionally the various preparations.
	3. To categorize seasonally the various preparations
	4.To be aware of differences in use of various ingredients used in regional cuisines of India.
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Become Familiar with the cuisines of the western and northern regions of India
	2. Become aware of various seasonal and festival preparations of the western and northern regions of India
Content Outline	• Western Cuisine: Cuisines of Maharashtra, Gujarat, Rajasthan • North Indian Cuisine: Cuisines of Jammu and Kashmir, Punjab, Uttar Pradesh and Madhya Pradesh
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Become Familiar with the cuisines of the Eastern and Southern regions of India
	2. Become aware of various seasonal and festival preparations of the western and northern regions of India
Content Outline	• Southern India Cuisine: Cuisines of Karnataka, Andhra Pradesh, Tamil Nadu and Kerala • Eastern India Cuisine: Cuisines of Bengal, Orissa, Assam

Assignments/Activities towards Comprehensive Continuous Evaluation

(CCE) :

- Projects on collating recipes from the students respective regions.
- Documenting food practices in their homes.
- Looking at Food magazines and preparing assignment on food recipes.

Bibliography:

- Chitra P,(1989) *Foods of Earth Tastes of Heaven: Vegetarian Cuisine of Gujrath* Prairie Web Press
- Cookery Books of Nita Mehta.
- Cookery Books of Tarla Dalal.
- Dalal T, 'The complete Gujarati Cook Book'
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- Philip T (1978), *'Indian Cuisine'*, Ministry of Information and Broadcasting Government of India: 14-15.
- Shenoy, Jaya, (1989*)'Dakshin Bharat'*. Saraswatha Prakashana

1.8 VALUE EDUCATION COURSE

This course will be taken opted from the common courses.

1.9 CO-CURRICULAR COURSE

This course is NSS/NCC/Cultural activities.

End of Semester I

Semester II

Syllabus Contents

2.1 Major (Core)

Course Title	**Basics of Nutrition**
Course Credits	4
Course Outcomes	After going through the course, learners will be able to
	1. Define basic nutrition concepts and terminology.
	2.Know the types of nutrients available from food
	3. Understand the concept of serving size and balanced diet
	4. Comprehend the contribution of macronutrients and micronutrients to health
	5. Understand the application of basic nutrition knowledge while making food choices to plan a balanced diet
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Explain basic concepts in nutrition
	2. Outline the six types of nutrients present in food
Content Outline	• Definition of Health, Nutrition, Nutrients, Food, Estimated Average Requirements (EAR), Balanced Diet, Recommended Dietary Allowances (RDA), Tolerable Upper Limit (TUL), Malnutrition (Undernutrition, Overnutrition, Optimum nutrition). • Introduction to the nutrients present in food, namely, Carbohydrates, Proteins, Fats, Vitamins, Minerals & Water.
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify the sources and Elaborate on the functions of water, and the Macronutrients available from food.

	2 Understand the conditions resulting from deficiencies and excess consumption of water and macronutrients..
Content Outline	Sources, Functions, Effects of Deficiencies and Excessive Consumption of • Carbohydrates • Proteins • Fats • Water
Module 3 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1.Identify the sources and functions of the Vitamins (Fat-soluble & Water-soluble) available from food.
	2. Understand the conditions resulting from deficiencies and excess consumption Vitamins (Fat-soluble & Water-soluble) available from food.
Content Outline	Sources, Functions, Effects of Deficiencies and Excessive Consumption of • Fat-Soluble Vitamins (Vitamins A, D, E & K) • Water-Soluble Vitamins (Vitamins B1, B2, B3, B6, B9, B12)
Module 4 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify the sources and functions of the Minerals (Macrominerals and Microminerals) available from food.
	2. . Understand the conditions resulting from deficiencies and excess consumption Minerals (Macrominerals and Microminerals) available from food.
Content Outline	Sources, Functions, Effects of Deficiencies and Excessive Consumption of • Macrominerals (Calcium & Phosphorus) • Microminerals (Iron, Iodine, Selenium, Zinc)

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

- Individual or group projects on classifying food items based on their main nutrients
- Individual or group projects on clinical signs of nutrients deficiencies and toxicities

Bibliography:

- Agarwal, A and Udipi, S. A. (2022). *Textbook of Human Nutrition* (2nd Edition), Jaypee Brothers Medical Publishers (P).
- Bamji, M.S. (2019), *Textbook of Human Nutrition* (4th Edition)**,** Oxford.
- Joshi, S (2021), *Nutrition and Dietetics* (5th Edition),McGraw Hill.
- Mudambi, S.R. and Rajgopal, M.V**. (**2020), *Fundamentals of Foods, Nutrition and Diet Therapy,* New Age International Pvt. Ltd.

2.2 Major (Core)

Course Title	**Basics of Nutrition (Pr.)**
Course Credits	**2**
Course Outcomes	After going through the course, learners will be able to
	1. Relate weight and measures of raw foods with cooked amounts
	2. Understand the concept of standardization of basic recipes (serving size and portion size)
	3. Identify and list food sources of various nutrients
	4. Develop and prepare recipes using rich sources on nutrients
	5. Develop and prepare multi-nutrient rich recipes to improve dietary nutrient adequacy.
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify and Summarize weights and measures of raw and cooked food items.
	2. Understand and demonstrate the concept of standardization of recipes (serving size, portion size)
Content Outline	• Weights and measures of cereals, millets, pulses, milk, milk products, eggs, fruits and vegetables. • Standardization of basic recipes.
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify and select recipes and calculate nutrients in single serving
	2. Apply the principles of nutrition to the optimize nutrient content in the recipe

Content Outline	**Identification, selection and preparation of Recipes for One Serving:** - Energy: high and low calorie - Proteins - Vitamin A - Vitamin C - B- complex vitamins - Calcium - Iron

Assignments/Activities towards Comprehensive Continuous Evaluation CCE)

- Assignments on collating pictures of rich sources of various nutrients.
- Individual assignments on planning multi-nutrient recipes to improve nutrient density of commonly consumed recipes

Bibliography:

- Agarwal, A. and Udipi, S. A. (2022), *Textbook of Human Nutrition* (2nd Edition), Jaypee Brothers Medical Publishers (P).
- Bamji, M.S. (2019), *Textbook of Human Nutrition* (4th Edition)**,** Oxford
- Joshi, S (2021), *Nutrition and Dietetics* (5th Edition), McGraw Hill.
- Mudambi, S.R. and Rajgopal, M.V**. (**2020), *Fundamentals of Foods, Nutrition and Diet Therapy,* New Age International Pvt. Ltd.

2.3 MINOR

Course Title	**Food Hygiene & Sanitation**
Course Credits	**2**
Course Outcomes	After going through the course, learners will be able to
	1. Identify causes of food borne illness symptoms and preventative measures.
	2. Elaborate on personal hygiene and health habits.
	3. Identify signs of food spoilage
	4. Demonstrate safe receiving, storing and handling raw and prepared foods.
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify sources of food contamination and have an understanding of food borne illnesses and their prevention
	2. Understand the importance of maintaining personal hygiene and handling food with care.
Content Outline	1. **Food contamination and spoilage** • Classification and characteristics of microorganisms. • Sources of contamination and causes of food spoilage • Food Safety: understanding Spoilage of foods and its prevention • Sources and prevention of food borne illnesses • Bacterial food infection and intoxication 2. **Sanitation, Management and Personal Hygiene** • Role of management in ensuring safe working conditions • Sanitary practices to be observed by food handlers • Need for training in sanitation • Planning a training program
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Understand safe food practices and the need of sanitation in all aspects of handling food.

	2.Develop an understanding of the significance of rigorously adhering to operating and cleaning procedures and Learn about the significance of pest control
Content Outline	**1. Hygiene and sanitation of Food** • Sanitary considerations for food storage and procurement • Sanitary guidelines for food preparation, cooking, and holding • Need for an effective cleaning program **2. Hygiene and sanitation of Plant** • Sanitary requirements for equipment's • Cleaning agents and tests for sanitization strength • Importance of water in the cleaning process • Pest control • Sanitary considerations for food product storage

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Quiz on topics related to food spoilage.
- Assignments on topics related to the syllabus.
- Case study / Survey of prevailing conditions of hygiene in given locality.

Bibliography:

- BC Cook Articulation Committee. (2015). Food Safety, Sanitation, and Personal Hygiene. Victoria, B.C.: BCcampus. Retrieved from https://opentextbc.ca/foodsafety/.
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2.4 OPEN ELECTIVE (NOT NECESSARY FROM MAJOR)

Course Title	Human Physiology
Course Credits	4 (2+2)
Course Outcomes	After going through the course, learners will be able to
	1. Explain the basic concepts in human physiology
	2. Understand the association between human physiology and Nutrition
	3.Develop an understanding of the functioning of various systems of the human body
	4. Develop basic skills for first-aid and measuring and interpreting basic body parameters
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Elaborate on the basic concepts and terminologies used in human physiology
	2. Identify and discuss the relationship between human nutrition and physiology
Content Outline	• Introduction to Human Physiology: Skeletal, Circulatory, Respiratory, Gastrointestinal, Excretory, Nervous, Reproductive and Endocrine systems of the body • Physiology and Human Nutrition
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Elaborate on the functioning of the circulatory, immune, respiratory and excretory systems of the human body
	2. Understand basics of the mechanism by which the human body maintains homoeostasis (Body temperature, Fluid-Electrolyte and Acid-Base balance)
Content Outline	• The Circulatory system and functioning of the heart • The Immune System • The Respiratory System • The Excretory System • The Homoeostatic mechanisms of the human body

Module 3 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Elaborate on the functioning of the Gastrointestinal and Nervous systems of the human body
	2. Understand the functioning of the Endocrine and Reproductive Systems of the human body
Content Outline	• The Gastrointestinal System – Organs of the GI system and basic process of digestion, absorption, utilization of food in the human body. • The Endocrine and Reproductive Systems of the human body

Module 4 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Develop basic first-aid skills, and learn the methods of measurement of body temperature and blood pressure
	2. Understand the basic interpretation of urine analysis and complete blood count parameters
Content Outline	Contents of the First-Aid box and different types of bandages and bandaging techniques • First-aid for dehydration, heat-stroke, etc • Measurement of body temperature and blood pressure • Determination of blood groups, making of a peripheral blood smear, basic interpretation of urinary and CBC parameters.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Quiz
- Assignments
- Individual measurement of body temperature, blood pressure, determination of blood group.

Bibliography:

- Chaudhari. Sujit K., (2004) *Concise Medical Physiology*, 5th ed. New Central Book Agency, Calcutta.
- Dutta, D.C.,(2016) *Textbook of Gynaecology* 7th ed Jaypee Brothers Medical Publishers.
- Gordon Sears, Robert S. Winwood J. L. Smith Wilson -*Anatomy and Physiology for Nurses*.6th ed., The London Bookworm
- Guyton, A.C., Hall J.E.(2011) *Textbook of Medical Physiology.*12th ed. Saunder's Elsivier.
- Kamath Sandhya A., *API Text Book of Medicine.* 11th ed.The Association of Physicians of India.
- Nitin Ashok John.,(2022) *Human Physiology*.14th ed. CBS Publishers & Distributors Pvt.Ltd

2.5 VOCATIONAL SKILL COURSE

This course will be taken from other Majors.

2.6 SKILL ENHANCEMENT COURSE

This course will be taken from the common courses.

2.7 ABILITY ENHANCEMENT COURSE

This course will be taken from the common courses.

2.8 INDIAN KNOWLEDGE SYSTEM COURSE

Course Title	**Cuisines of India (Pr.)**
Course Credits	2
Course Outcomes	After going through the course, learners will be able to
	1. Become familiar with use of various ingredients used in regional cuisines
	2. To prepare common recipes made in different regions of India
	3. To prepare various seasonal recipes made in different regions of India.
	4. To prepare various festivals recipes made in different regions of India
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. Prepare recipes from cuisines of the western and northern regions of India
	2. Prepare various seasonal and festival preparations of the western and northern regions of India.
Content Outline	Western Cuisine: Cuisines of Maharashtra, Gujarat, Rajasthan • North Indian Cuisine: Cuisines of Jammu and Kashmir, Punjab, Uttar Pradesh and Madhya Pradesh
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to

	1. Prepare recipes from cuisines of the Southern and Eastern regions of India
	2. Prepare various seasonal and festival preparations of the Southern and Western regions of India
Content Outline	• Southern India Cuisine: Cuisines of Karnataka, Andhra Pradesh, Tamil Nadu and Kerala • Eastern India Cuisine: Cuisines of Bengal, Orissa, Assam

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE) :

- Projects on preparing recipes from respective regions.

Bibliography:

- Chitra P,(1989) *Foods of Earth Tastes of Heaven: Vegetarian Cuisine of Gujrath* Prairie Web Press
- Cookery Books of Nita Mehta.
- Cookery Books of Tarla Dalal.
- Dalal T, 'The complete Gujarati Cook Book'
- Food Magazines
- Nambiar, Vanisha (2021) *Indian Food Anthropology and the Eat Right Movement Volume I*. Selective and Scientific books
- Nambiar, Vanisha (2021) *Indian Food Anthropology and the Eat Right Movement Volume II*. Selective and Scientific books
- 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.
- Philip T (1978), *'Indian Cuisine'*, Ministry of Information and Broadcasting Government of India: 14-15.
- Shenoy, Jaya, (1989*)'Dakshin Bharat'*. Saraswatha Prakashana

2.9 CO-CURRICULAR COURSE

This course is NSS/NCC/Cultural activities.

End of Semester II