SNDT Women's University, Mumbai

Bachelor Of Science
Home Science
(Food Science & Quality Control)

B.Sc. In H.Sc. FSQC

As Per NEP – 2020

Semester – I & II

Syllabus
(W.E.F. Academic Year 2025-26)

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 Majoror 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 andtechnological solutions, Health & Wellness, Yoga education, sports, and fitness	NA

IKS	Indian Knowledge System	Generic IKS Course: basicknowledge 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 MajorSubject	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 andservice		Related to Major
RP	Research Project	corresponding to the MajorSubject	Related to Major

Program Template

Programme Degree		B.Sc.
Specialization Major		Food Science & Nutrition
Faculty		Science & Technology
Specialization		Food Science & Quality Control
Preamble		The Program lays a strong emphasis on an integrated approach through Multidisciplinary subjects that will enable students to build a variety of skills and a broad base of professional knowledge related to food science and quality control. It encourages the development of scientific perspectives and a research attitude in students related to food science and nutrition. The programme focuses on quality control aspects of food science and nutrition and trains learners in human physiology, biochemistry, nutrition, food microbiology, food preservation, Post-Harvest Technology, Food Processing, Food Equipments, Labeling, Food Toxicology and their relationships. At the end of the programme, the learners can work in the areas of food product development and food quality control.
Programme Specific Outcomes (PSOs)		After completing this programme, Learner will -
	1.	Examine the composition of various foods and the changes taking place during their processing and Cooking.
	2.	Analyze food and nutrition science.
	3.	Comprehend the fundamentals of human physiology, biochemistry, nutrition, food microbiology, food preservation, Post-Harvest Technology, Food Processing, Food Equipments, Labeling, Food Toxicology and their relationships.
	4.	Acquire knowledge and confidence to work in the area of food quality control and food product development.
	5.	Undertake research in and about Food analysis.
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 or have required credits as per the government norms to be able to join undergraduate programme. Student having studied Chemistry at 10+2 will be given preference.
Intake for affiliated Colleges		30 (Batch size for Practical 15)

Structure with

Course Title

B.Sc. In Home Science - Food Science & Quality Control

SN	Courses	Type of Course	Credits	Marks	Int	Ext
	Semester I					
10030301	Food Safety, Hygiene and Sanitation I (Th)	Major (Core)	2	50	50	0
		Major (Core)	2	50	50	0
		Major (Core)	2	50	50	0
10430311	Food Preservation (2 Th + 2 Pr)	OEC	4	100	50	50
10630301	Food Safety, Hygiene and Sanitation (Pr)	VSC S1	2	50	50	0
10730301	Physical and Analytical Chemistry (Pr)	SEC	2	50	0	50
10810111	English For Academic Writing-Paper I (For Students of English Medium)	AEC (English) **(Any One)**	2	50	0	50
10810112	English Language and Literature- I (For Students of Non-English medium)					
11051111	Inception of India Knowledge System	IKS (Generic)	2	50	0	50
10952111	Introduction to Indian Constitution	VEC	2	50	0	50
11450121	Basics of National Service Scheme	CC **(Any One)**	2	50	50	0
11450221	National Cadets Corps. (NCC) Studies- I					
11450322	Health and Wellness					
11450421	Performing Arts Exploration					
			22	**550**	**300**	**250**

SN	Courses	Type of Course	Credits	Marks	Int	Ext
	Semester II					
20030311	Food Safety, Hygiene and Sanitation II (Th)	Major (Core)	2	50	0	50
		Major (Core)	2	50	0	50
		Major (Core)	2	50	0	50
		VSC S2	2	50	50	0
		VSC S3	2	50	50	0
20430311	Basic Food Analysis (Pr)	OEC	4	100	50	50
20730301	Human Physiology (Pr)	SEC	2	50	50	0
20810111	English For Academic Writing- Paper II (For Students of English Medium)	AEC (English) **(Any One)**	2	50	0	50
20810112	English Language and Literature- II (For Students of Non-English medium)					
20952111	Environment Awareness	VEC	2	50	0	50
21450121	Volunteerism and National Service Scheme	CC **(Any One)**	2	50	50	0
21450221	National Cadets Corps. (NCC) Studies- II					
21450323	Yoga Education					
21450421	Fine Art					
			22	**550**	**250**	**300**

Exit with UG Certificate with 4 extra credits (44 + 4 credits)

Syllabus

Semester I

1.1 Major (Core)

Course Title	**Food Safety, Hygiene and Sanitation I (Th)**
Course Credits	2
Course Outcomes	After going through the course, learners will be able to
	1. Identify critical control points 2. Describe food borne illness symptoms and preventative methods. 3. Describe personal hygiene and health habits 4. Describe how to prepare food according to safe time and temperature principles. 5. Evaluate the recent developments in the control of food safety.
Module 1 (Credit 1) - Food Contamination and Spoilage	
Learning Outcomes	After learning the module, learners will be able to -
	1. Identify various sources of food contamination. 2. Describe the characteristics of food spoilage microorganisms & common parasitic infestations in foods. 3. Explain the conditions that lead to food spoilage. 4. Identify signs of spoilage in different food categories. 5. Differentiate between bacterial food intoxication and food infection with examples.
Content Outline	• **Food contamination and spoilage** 1) Sources of contamination 2) Characteristics of microbes 3) Conditions leading to food spoilage 4) Signs of spoilage in different food categories 5) Bacterial food intoxication- Staphylococcus aureus, Bacillus cereus 6) Bacterial food infection- E.coli, Salmonella 7) Parasitic infestations 8) Source and control of food borne illness

Module 2 (Credit 1) - Hygiene, Safe Food Handling, and Recent Developments	
Learning Outcomes	After learning the module, learners will be able to -
	1. Describe the principles of personal hygiene and health practices in food service. 2. Explain the role of hygienic practices in preventing food-borne diseases. 3. Identify critical control points in food production and service. 4. Analyze the importance of sanitation procedures in maintaining food safety.
Content Outline	• **Sanitation and food** 1) Sanitary aspects to be observed during food purchase and storage 2) Sanitary procedures to be followed while preparation, cooking and holding food 3) Need for an efficient cleaning program 4) Sanitary practices to be observed by food handlers • **Food safety issues** 1) Physical, chemical and microbiological contaminants 2) Food Safety system

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

1. Assignment on signs of spoilage in different food categories
2. Assignment on sanitary aspects to be observed during food purchase and storage

References:

1. Kumar, Alok. (2022). *Food Hygiene, Safety and Quality*. I K International.
2. Roday, Sunetra. (2017). *Food Hygiene and Sanitation with case studies* (2nd ed.). McGraw Hill.

3. Lewis, Roger. (2017). *Essentials of Food Safety the Fight Against Microorganisms*. iUniverse.

4. Marriot, N.G., WesSchilling, M. and Gravani, R.B. (2018) *Principles of Food Sanitation* (6^{th} ed.). Springer.

5. Marwah, Kavita. (2022). *Food Hygiene*. Meri Pustak.Com.

6. Orolugbagbe Gboyega (2015). *Handbook of Food Safety*. Astral International Pvt. Ltd.

7. Tamilselvan, B. (2023). *FSSAI Food Safety Handbook.* Notion Press

8. Tripathty, S.M. (2023). *Food Microbiology and Safety*. Laxmi Publications Pvt. Ltd.

1.4 Open Elective Courses/ Generic (OEC)

Course Title	**Food Preservation (2 Th + 2 Pr)**
Course Credits	4
Course Outcomes	After going through the course, learners will be able to
	1. Explain the need, importance, and scope of food preservation. 2. Describe the basic principles and factors influencing food preservation. 3. Classify and explain different traditional and modern food preservation methods. 4. Apply suitable food preservation techniques to prepare various preserved products. 5. Evaluate the effectiveness of different food preservation methods based on food type and storage conditions.
Module 1 (Credit 1) - Introduction to Food Preservation	
Learning Outcomes	After learning the module, learners will be able to
	1. Explain the importance and objectives of food preservation. 2. Identify traditional methods of food preservation. 3. Analyze the factors affecting post-harvest storage stability of foods. 4. Describe the causes of food spoilage due to microbial, insect, enzymatic, and chemical activities. 5. Explain the basic principles involved in food preservation.
Content Outline	• Introduction to Food Preservation 1) Importance and objectives of food preservation and traditional methods of food preservation. 2) Factors affecting post-harvest storage stability of foods. 3) Basic principles of Food Preservation 4) Causes of food spoilage-growth and activity of microorganisms and insects. 5) Action of enzymes and chemical reactions. 6) Physical changes in cereals, pulses, fruits and vegetables. 7) Methods of Food Preservation involving temperatures-Asepsis and removal of micro- Organisms 8) Use of high temperature 9) Factors affecting heat resistance, TDT and Pasteurization

	Canning and its use in food
Module 2 (Credit 1) - Preservation Using Temperature	
Learning Outcomes	After learning the module, learners will be able to
	1. Describe methods involving asepsis and removal of microorganisms. 2. Explain the use of various preservatives used in the industry 3. Interpret the concepts of TDT (Thermal Death Time) and heat resistance. 4. Differentiate between pasteurization and canning processes. 5. Apply appropriate heat treatment techniques based on food type.
Content Outline	• 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. • Other Methods of Food Preservation • Use of preservatives - 1. Classification of permissible food preservatives-class I and class Il preservatives, developed preservatives.
Module 3 (Credit 1) - Food Preservation Techniques	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify equipment and tools used in food preservation. 2. Demonstrate preservation methods such as drying, pickling, jam/jelly making, etc. 3. Follow hygiene and safety protocols while preparing preserved foods. 4. Record and report observations and outcomes from preservation practices. 5. Evaluate the sensory and storage quality of preserved products.
Content Outline	• Preparation of fruit juice, squash and cordial. • Preparation of mix fruit jam, jelly, marmalade- compare and find the difference.

	• Preparation of pickles-mixed vegetables, mango pickle, lemon pickles, instant pickle, sweet pickle, oil pickle, vinegar pickle • Preparation of green chili sauce, tamarind chutney
Module 4 (Credit 1) - Quality Evaluation and Advances in Preservation	
Learning Outcomes	After learning the module, learners will be able to
	1. Assess the shelf life and microbial safety of preserved foods. 2. Compare traditional and modern preservation techniques. 3. Interpret food labeling and preservation-related regulatory standards. 4. Discuss recent advances in food preservation technologies.
Content Outline	• Preparation of tomato ketchup, sauce and chutney. • Preparation of instant mixes-*upma/dhokla/wadas* • Freezing of fruits and vegetables. • Dehydration of foods- vegetables, fruits, dried products like *kurdai, papad, chakali*, vermicelli etc. • Preparation of dried chutneys and masalas

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

1. Assignment on Methods of Food Preservation
2. Preparation of products

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.

1.5 Vocational Skill Courses (VSC)

Course Title	**Food Safety, Hygiene and Sanitation (Pr)**
Course Credits	2
Course Outcomes	After going through the course, learners will be able to
	1. Handle the different lab equipment 2. Apply basic microbiological techniques for safety and hygiene of food 3. Analyze the microbiological and hazardous causes of food spoilage. 4. Perform the methods of detection and examination of micro-organisms that causes food poisoning. 5. Apply the techniques to detect the limit of adulterants in different food samples and check for compliance related to FSSAI guidelines.
Module 1 (Credit 1) - Microbiological Examination and Food	
Learning Outcomes	After learning the module, learners will be able to
	1. Perform the methods of detection and examination of microorganisms that causes food poisoning. 2. Analyse the microbiological and hazardous causes of food spoilage
Content Outline	• Examine water samples and check for physical quality and Bacteriological quality. • Determine microorganisms in milk and canned foods • Analyse sanitizers solution for detecting the quantity of Sodium Hypochlorite, Calcium Hypochlorite and iodine.
Module 2 (Credit 1) - Detection of Adulterants and Regulatory Compliance	
Learning Outcomes	After learning the module, learners will be able to
	1. Perform the methods of detection and examination of microorganisms that causes food poisoning. 2. Apply the techniques to detect the limit of adulterants in different food samples and check for compliance related to FSSAI guidelines
Content Outline	• Use kits for rapid detection of poisonous microorganisms. • Visual examination of growth, description of colony morphology, turbidity measure by colorimetry • Perform the Methods for Prevention of cross contamination. • Identify various kinds of additives- food colour, preservatives, artificial sweeteners, toxins, adulterants and pesticide residues

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

1. Perform the practical on methods of detection and examination of microorganisms that causes food poisoning
2. Application of the techniques to detect the adulterants in different food samples

References:

1. Kumar, Alok. (2022). *Food Hygiene, Safety and Quality*. I K International.
2. Roday, Sunetra. (2017). *Food Hygiene and Sanitation with case studies* (2nd ed.). McGraw Hill.
3. Lewis, Roger. (2017). *Essentials of Food Safety The Fight Against Microorganisms*. Universe.
4. Marriot, N.G., WesSchilling, M. and Gravani, R.B. (2018) *Principles of Food Sanitation* (6th ed.). Springer.
5. Marwah, Kavita. (2022). *Food Hygiene*. Meri Pustak.Com.
6. Orolugbagbe Gboyega (2015). *Handbook of Food Safety*. Astral International Pvt. Ltd.
7. Tamilselvan, B. (2023). *FSSAI Food Safety Handbook.* Notion Press
8. Tripathty, S.M. (2023). *Food Microbiology and Safety*. Laxmi Publications Pvt. Ltd.

1.6 Skill Enhancement Courses (SEC)

Course Title	**Physical and Analytical Chemistry (Pr)**
Course Credits	2
Course Outcomes	After going through the course, learners will be able to
	1. Describe the fundamental principles of physical and analytical chemistry. 2. Explain the steps and concepts behind various analytical techniques. 3. Apply analytical techniques to perform quantitative and qualitative experiments. 4. Demonstrate the use of instrumentation in analyzing chemical and food-related samples. 5. Develop problem-solving and critical thinking abilities in analytical contexts.
Module 1 (Credit 1) - Physical Chemistry and Instrumentation Techniques	
Learning Outcomes	After learning the module, learners will be able to
	1. Explain the basic principles involved in physical chemistry experiments. 2. Use the various instrumentation techniques
Content Outline	**Physical Chemistry** • To determine the heat of neutralization of strong acid or strong base • To determine the relative fuel value of kerosene to ethyl alcohol • To determine the λ max and concentration of $CuSO_4$ colourimetrically • To determine the λ max and concentration of ascorbic acid colourimetrically • To determine the molar absorptivity coefficient of $K_2Cr_2O_7$ colourimetrically • To study the adsorption of acetic acid on charcoal from its solution • To study the hydrolysis of ester and find out the order of reaction • To determine the total soluble solids content of various food samples
Module 2 (Credit 1) - Analytical Techniques and Skill Development	
Learning	After learning the module, learners will be able to

Outcomes	1. Identify, describe and perform various analytical techniques used in chemistry. 2. Develop analytical skills
Content Outline	**Analytical Chemistry** • To prepare 1N KMnO4 solution • To prepare KMnO4 solutions of different normalities using dilution method • To separate and identify a binary mixture of inorganications by paper chromatography • To separate and identify a binary mixture of amino acids by paper chromatography • To separate the mixture of ortho and para nitro aniline by thin layer chromatography • To separate the cations from the given mixture by column chromatography using cellulose • To determine the amount of Nickel gravimetrically as Ni-DMG

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Perform the practical on Physical and Analytical Chemistry in laboratory.

References:

1. Chatwell G. R. and Anand S. (2019). *Instrumental methods of chemical analysis*, Himalaya Publishing House.
2. Dittmar, William. (2023). *Analytical Chemistry, Laboratory Exercises*, Legal Street Press
3. Gilbert W. Castelian. (2004). *Physical Chemistry* 3rd Edition, Narosa Publishing House.
4. Huda S. Alhasan and Nadiyah Alahmadi (2021). *Principles of Qualitative Inorganic Analysis: Precipitation, Separation and Identification of Cations*. Bentham Science Publishers Pte.Ltd. Singapore.
5. S M Khopkar, (2022). *Basic Concepts Of Analytical Chemistry*, 5th edition, New Age International publishers, New Delhi.
6. Yeshajahu Pomeranz, Clifton E. Meloa, (2000). *Food Analysis: Theory and Practice*, 3rd edition, Aspen Publishers, United States of America.

Semester-II

2.1 Major (Core)

Course Title	Food Safety, Hygiene and Sanitation II (Th)
Course Credits	2
Course Outcomes	After going through the course, learners will be able to
	1. Identify critical control points 2. Describe food borne illness symptoms and preventative methods 3. Describe personal hygiene and health habits 4. Describe how to prepare potentially hazardous food according to safe time and temperature principles.
Module 1 (Credit 1) -Plant Sanitation and Pest Control	
Learning Outcomes	After learning the module, learners will be able to
	1. Describe the sanitary requirements for food equipment and cleaning procedures. 2. Identify various cleaning agents and explain how to test their sanitization strength. 3. Explain the role and quality standards of water used in sanitation processes. 4. Analyze the importance and methods of pest control in food establishments.
Content Outline	• **Plant sanitation** 1. Sanitary requirements for equipments 2. Cleaning agents and tests for sanitization strength 3. Importance of water in the cleaning process 4. Pest control
Module 2 (Credit 1) - Personal Hygiene and Food Handler Training	
Learning Outcomes	After learning the module, learners will be able to
	1. Explain the significance of personal hygiene and sanitary food handling. 2. Identify key hygiene practices required by food handlers. 3. Analyze the importance of food safety training for food handlers. 4. Evaluate the components of an effective food safety training program.

Content Outline	• **Personal hygiene, management and sanitation** 1) Sanitary practices to be observed by food holders 2) Importance of good habits exercise and recreation 3) Need for training in sanitation 4) Planning a training in program 5) Role of management in ensuring safe working conditions

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

1. Assignment on Cleaning agents
2. Assignment on Role of management in ensuring safe working conditions

References:

1. Kumar, Alok. (2022). *Food Hygiene, Safety and Quality*. I K International.
2. Roday, Sunetra. (2017). *Food Hygiene and Sanitation with case studies* (2nd ed.). McGraw Hill.
3. Lewis, Roger. (2017). *Essentials of Food Safety The Fight Against Micro organisms*.iUniverse.
4. Marriot, N.G., WesSchilling, M. and Gravani, R.B. (2018) *Principles of Food Sanitation* (6th ed.). Springer.
5. Marwah, Kavita. (2022). *Food Hygiene*. Meri Pustak.Com.
6. Orolugbagbe Gboyega (2015). *Handbook of Food Safety*. Astral International Pvt. Ltd.
7. Tamilselvan, B. (2023). *FSSAI Food Safety Handbook.* Notion Press
8. Tripathty, S.M. (2023). *Food Microbiology and Safety*. Laxmi Publications Pvt. Ltd.

2.6 Open Elective Courses/ Generic (OEC)

Course Title	**Basic Food Analysis (Pr)**
Course Credits	4
Course Outcomes	After going through the course, learners will be able to
	1. Impart basic skills to do laboratory work and demonstrate basic laboratory skills for conducting food analysis. 2. Explain the general principles of instrumental techniques used in food analysis. 3. Perform analytical techniques to estimate food components such as protein and fat. 4. Identify and detect common adulterants in food samples. 5. Describe the qualitative standards and specifications prescribed by FSSAI.
Module 1 (Credit 1) - Introduction to Food Analysis and Instrumentation	
Learning Outcomes	After learning the module, learners will be able to
	1. Explain the significance and role of food analysis in ensuring food quality and safety. 2. Define sampling and describe its importance in food analysis. 3. Differentiate between various sampling techniques and their applicability. 4. Evaluate the advantages and limitations of different sampling methods. 5. Describe the working principles and uses of basic instruments used in food analysis (e.g., pH meter, Colorimeter, Spectrophotometer). 6. Operate standard laboratory instruments like the Soxhlet apparatus and Kjeldahl's unit for food composition analysis.

Content Outline	• **Introduction to food analysis and its importance.** • **Sampling** 1. Definition of sampling 2. Sampling methods/ techniques. 3. Sampling Techniques in food analysis 4. General classification of sampling methods. 5. Advantages and disadvantages of Sampling • **General instrumental methods –** Working principle and uses of various laboratory instruments used in food analysis- pH meter, Colorimeter, Spectrophotometer, Centrifuge, Kjeldahl's apparatus for protein estimation, Soxhlet apparatus for fat estimation, Muffle furnace, Water bath.
Module 2 (Credit 1) -Estimation of Food Components	
Learning Outcomes	After learning the module, learners will be able to
	1. Explore analytical methods used in estimation of proximate principles. 2. Describe significance of chemical constants of fats and oils.
Content Outline	**Quantitative Analysis of proximate principles:** • Estimation of moisture by AOAC method of dehydration. • Estimation of crude fat/oil by solvent extraction method. • Estimation of total ash by A.O.A.C. method. • Estimation of protein by Macro Kjeldahl method. **Chemical constants of fats and oils.** • Determination of Acid value by NIN method. • Determination of Saponification value by NIN method. • Determination of Iodine value by NIN method.
Module 3 (Credit 1) - Detection of Food Adulterants	
Learning Outcomes	After learning the module, learners will be able to
	1. Perform analytical methods used in estimation of various food components.
Content Outline	**Estimation of Food Components** • Estimation of total and free sugar from honey by Benedict's/ Lane and Eynon's quantitative reagent method**.** • Determination of Ascorbic acid (Vit. C) from food sources by 2, 6, dichlorophenol indophenol method. • Estimation of sodium chloride (NaCl) salt from butter and cheese. • Estimation of Acidity in milk and ice cream by titrimetric method.

Module 4 (Credit 1) - Food Quality Standards and Regulations	
Learning Outcomes	After learning the module, learners will be able to
	1. Describe food adulterants and know methods of analysis. 2. Detect adulterants present in various foods
Content Outline	**Qualitative analysis of common food adulterants** • Fats and oils • Spices and condiments • Milk and milk products • Cereals and pulses • Sugar, honey and jaggery • Tea and coffee • Sweets and confectionary

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

- Perform the practical on Food Analysis in laboratory.

References:

1. Deshpande, H.W. and Poshadri, A.(2023). *Food Analysis and Quality Control*. Nipa Genx Electronic Resources & Solutions Pvt Ltd
2. Pomeranz, Y. and Meloan, C.E. (2004). *Food analysis Theory and Practice* (3rd ed.). CBS Publishers.
3. Sathe, A. Y. (1999). *A First Course in Food Analysis*. New age International Pvt. Ltd.
4. Sehgal, Shalini. (2020). *A Laboratory Manual of Food Analysis*. Dreamtech Press.
5. Siva Subramanian, N., Ushasree, P. and Reddy, G. Naveen Kumar. (2022). *Textbook of Food Analysis.* Unique Pub International.

2.7 Skill Enhancement Courses (SEC)

Course Title	**Human Physiology (Pr)**
Course Credits	2
Course Outcomes	After going through the course, learners will be able to
	1. Recall and explain the basic concepts of human physiology. 2. Illustrate the relationship between physiological systems and nutrition. 3. Describe and demonstrate the functioning of major physiological systems. 4. Perform basic physiological measurements and interpret the findings (e.g., blood pressure, blood group, hemoglobin). 5. Apply basic first-aid knowledge and use relevant tools and apps for health monitoring.
Module 1 (Credit 1) -Introduction to Human Physiology and Basic Tests	
Learning Outcomes	After learning the module, learners will be able to
	1. Identify and name the major bones of the human skeleton. 2. Perform simple clinical tests like estimation of haemoglobin and blood group and blood pressure etc and interpret the reports
Content Outline	1. Study of human skeleton and identification of bones. 2. Estimation of haemoglobin and understanding and interpretation of hemogram 3. Types of blood groups and Estimation of blood groups 4. Demonstrations of peripheral blood smear. Importance of complete blood count. 5. Measurement of pulse rate and blood pressure and interpretation. 6. Different apps and instruments 7. Measurement of blood glucose using glucometer and its interpretation and discussion 8. Discussion of normal components of urine. Test for abnormal components like sugar, albumin and acetone and discussion on diseases in which they are found.
Module 2 (Credit 1) - Understanding Body Systems and First Aid Basics	
Learning Outcomes	After learning the module, learners will be able to

	1. Administer first aid for common emergency situations. 2. Carry out the basic principles of home nursing.
Content Outline	1. FIRST AID a) Definition, aims, qualities of first aider, contents of first aid box. b) Different types of bandages and bandaging techniques. 2. WOUNDS a) Classification, dressing and management of hemorrhage- basic principles and discussion about bleeding from various parts of body. 3. FRACTURE a) Types, symptoms, management. b) Sprain and dislocation ***First Aid for*** - foreign bodies in eye, ear, nose, skin. ***First Aid for -*** fainting, burns, heat stroke, asthma, convulsions, electric shock and heart attack. ***First Aid for -*** common poisoning, dog bite, snake bite, bee-sting and scorpion bite. 4. BASIC PRINCIPLES OF HOME NURSING- a) Measuring body temperature, steam inhalation, body sponging, taking care of bed ridden patient and enema. b) Cardio pulmonary resuscitation

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

1. Individual measurement of body temperature, blood pressure, determination of blood group
2. Correlating measurements with health conditions.
3. Practicing first aid processes.

References:

1. First Aid, St. John's Ambulance Association
2. Guyton, A.C., Hall J.E. (2020). *Textbook of Medical Physiology*, Prism Books Pvt Ltd., Bangalore.
3. Hutchison (2017). *Clinical Methods: An Integrated Approach to Clinical Practice*, Elsevier.
4. Nitin A J. (2022). 14th ED. *C C Chatterjee's Human Physiology*. CRS Publishers and Distributors PVT LTD.