



**BACHELOR OF SCIENCE IN FOOD PROCESSING TECHNOLOGY AND
MANAGEMENT**

PROGRAMME CODE: BF

**CHOICE BASED CREDIT SYSTEM (CBCS) &
LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK (LOCF)**

SCHEME OF EXAMINATION & SYLLABUS

(w.e.f 2026 - 2027 onwards)

REGULATIONS 2026



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UNDERGRADUATE PROGRAMMES

(a) Qualification Descriptors

Aligned with NHEQF Level 6 (Bachelor's Degree Level).

A Bachelor's Degree signifies that a learner has completed a structured programme of study that develops disciplinary knowledge, professional competence, transferable skills and ethical values.

Graduates are expected to demonstrate:

- A systematic understanding of the discipline and its linkages with related fields
- Procedural and professional knowledge relevant to employment, higher education and public service
- Ability to identify problems, collect and analyze data, and develop evidence-based solutions
- Effective communication of academic and professional work
- Capacity for self-directed learning and adaptation to new contexts
- Ability to apply disciplinary knowledge and transferable skills in real-world contexts
- Development of employability skills relevant to professional careers

(b) Graduate Attributes (GAs)

GA Code	Graduate Attributes
GA1	Disciplinary Knowledge
GA2	Communication Skills
GA3	Critical Thinking
GA4	Problem Solving
GA5	Analytical Reasoning
GA6	Research-related Skills
GA7	Cooperation/Teamwork
GA8	Scientific Reasoning
GA9	Reflective Thinking
GA10	Information/Digital Literacy
GA11	Self-Directed Learning
GA12	Multicultural Competence
GA13	Moral and Ethical Awareness/Reasoning
GA14	Leadership Readiness
GA15	Lifelong Learning

(c) GAs – Written Measured

These GAs are directly measurable through written examinations, assignments, or structured theory evaluation.

GA	Attribute	Measure	Assessment Method
GA1	Disciplinary Knowledge	Strongly	Theory examinations, concept-based questions, structured problem solving
GA3	Critical Thinking	Strongly	Case analysis, reasoning questions
GA4	Problem Solving	Strongly	Application-oriented problems, scenario-based questions
GA5	Analytical Reasoning	Strongly	Data interpretation, logical analysis, numerical exercises
GA6	Research-related Skills	Partially	Research oriented questions, data interpretation, literature review writing
GA8	Scientific Reasoning	Partially	Evidence-based explanations, logical justification questions
GA9	Reflective Thinking	Limited	Short reflective writing responses
GA10	Information/Digital Literacy	Limited	Application of digital tools and information ethics

(d) GAs – Performance based

These require observation of behaviour, participation, skill demonstration, or real-time engagement.

GA	Attribute	Measure	Assessment Method
GA2	Communication Skills	Strongly	Presentations, seminars, viva voce, group discussions
GA7	Cooperation/Teamwork	Strongly	Group projects, peer evaluation, collaborative assignments
GA11	Self-Directed Learning	Limited	Independent assignment / Project work / Online learning task
GA12	Multicultural Competence	Partially	Group activities with diverse teams / Fieldwork / Community engagement, Participation in cultural activities,
GA13	Moral and Ethical Awareness/Reasoning	Partially	Behavioural observation methods, Reflective reports
GA14	Leadership Readiness	Limited	Team leadership in project, Event coordination
GA15	Lifelong Learning	Limited	Participation in value added courses, certification

**Department of Food Processing Technology and Management
(FPTM)**

Vision

- To nurture young minds through excellence in food, nutritional sciences, and food processing, equipping them with knowledge, skills, and critical thinking to foster innovation, interdisciplinary research, and industry collaboration enhancing employability, entrepreneurship, and community well-being while addressing nutrition, food safety, and global food security through sustainable practices.

Mission

- To provide high-quality education in food, nutritional sciences, and food processing, building strong scientific knowledge, technical skills, and professional competence in students.
- To foster interdisciplinary research and innovation that addresses emerging challenges in nutrition, food safety, sustainable food systems, and global food security that promote community health, food safety, sustainable practices, and societal well-being.
- To strengthen partnerships with the food industry, enhancing practical exposure, professional skills, employability, and the capacity to translate knowledge into real-world solutions.
- To nurture entrepreneurial thinking, leadership, and innovation among students, preparing them for successful careers and impactful contributions in the food sector and allied industries.

Bachelor of Science in Food Processing Technology and Management

Programme Objectives, Outcomes and Mapping

Programme Educational Objectives (PEOs)

(Expected career and professional achievements of graduates within three to five years of completing the programme)

PEO1: To empower graduates to excel as professionals in food processing and management, demonstrating leadership, ethical responsibility, and a commitment to equity and societal well-being.

PEO2: To foster interdisciplinary research and innovation capabilities that enable alumni to address challenges in nutrition, food safety, sustainable food systems, and global food security.

PEO3: To develop graduates with entrepreneurial acumen and industry-ready skills, capable of contributing effectively to the food sector and allied industries while promoting environmental sustainability.

PEO4: To cultivate lifelong learning and higher education engagement, encouraging graduates to pursue advanced studies, professional development, and evidence-based contributions to society.

PEO5: To instill social responsibility, inclusion, and dignity, enabling graduates to positively impact community health, sustainable practices, and equitable development in local and global contexts.

Programme Learning Outcomes (PLOs)

(Specific abilities, knowledge, and skills that graduates are expected to demonstrate upon Graduation)

After Completion of the program, the students will

PLO1: Apply core concepts of food science, nutritional sciences, and food processing to analyze and solve real-world problems in food systems

PLO2: Design and implement experiments or pilot-scale processes to improve food quality, safety, and sustainability

PLO3: Evaluate and interpret data from food processing and nutritional studies to make informed decisions for product development and research initiatives

PLO4: Demonstrate effective communication of technical information, research findings, and project outcomes to diverse audiences

PLO5: Formulate innovative solutions or entrepreneurial strategies for food processing and management challenges considering societal, environmental, and ethical dimensions.

PLO6: Collaborate effectively in multidisciplinary teams to plan, execute, and evaluate food-related projects or initiatives

PLO7: Critically analyze research literature and integrate evidence-based knowledge into practice for sustainable food system solutions

PLO8: Utilize digital tools and information resources to access, manage, and communicate knowledge in food science and technology

PLO9: Demonstrate leadership and ethical responsibility in professional practice, industry engagement, and community-focused initiatives

PLO10: Engage in lifelong learning to advance professional skills, research capabilities, and contributions to nutrition, food safety, and public health

PLO11: Assess and implement sustainable practices in food processing and management to address environmental and societal challenges.

PLO12: Reflect on multicultural and societal dimensions in food technology, promoting equity, inclusion, and community well-being.

PLOs with Bloom's Levels, Assessment Methods, and Graduate Attribute Mapping

PLO No	Programme Learning Outcome	Bloom's Level	Assessment Methods	Mappe d GAs
PLO1	Apply core concepts of food science, nutritional sciences, and food processing to analyze and solve real-world problems in food systems.	K3 (Apply)	Practical, Project, Case Study	GA1, GA4, GA5
PLO2	Design and implement experiments or pilot-scale processes to improve food quality, safety, and sustainability.	K6 (Create)	Laboratory Practical, Project, Field Work	GA1, GA3, GA6
PLO3	Evaluate and interpret data from food processing and nutritional studies to make informed decisions for product development and research initiatives.	K5 (Evaluate)	Project, Practical, Seminar	GA5, GA8, GA10
PLO4	Demonstrate effective communication of technical information, research findings, and project outcomes to diverse audiences.	K3 (Apply)	Seminar, Presentation, Report Writing	GA2, GA10, GA11, GA12
PLO5	Formulate innovative solutions or entrepreneurial strategies for food processing and management challenges considering societal, environmental, and ethical dimensions.	K6 (Create)	Case Study, Project, Internship	GA3, GA9, GA13, GA14
PLO6	Collaborate effectively in multidisciplinary teams to plan, execute, and evaluate food-related projects or initiatives.	K3 (Apply)	Group Project, Practical, Field Work	GA7, GA9, GA 14
PLO7	Critically analyze research literature and integrate evidence-based knowledge into practice for sustainable food system solutions.	K4 (Analyze)	Seminar, Literature Review, Project	GA3, GA6, GA11
PLO8	Utilize digital tools and information resources to access, manage, and communicate knowledge in food science and technology.	K3 (Apply)	Practical, Project, Seminar	GA1, GA2, GA10
PLO9	Demonstrate leadership and ethical responsibility in professional practice, industry engagement, and community-focused initiatives.	K5 (Evaluate)	Internship, Case Study, Project	GA13, GA14
PLO10	Engage in lifelong learning to advance professional skills, research capabilities, and contributions to nutrition, food safety, and public health.	K5–K6 (Evaluate/ Create)	Self-Study Report, Seminar, Project	GA11, GA15
PLO11	Assess and implement sustainable practices in food processing and management to address environmental and societal challenges.	K5 (Evaluate)	Project, Field Work, Practical	GA1, GA3, GA4, GA8
PLO12	Reflect on multicultural and societal dimensions in food technology, promoting equity, inclusion, and community well-being.	K5 (Evaluate)	Seminar, Project, Internship	GA6, GA9, GA12

Programme Specific Outcomes (PSOs)

(Expected knowledge, skills, and competencies that graduates will acquire by the end of the programme)

- PSO1** : Apply principles of food chemistry, microbiology, and biochemistry to evaluate food composition, quality changes, and safety parameters across processing systems
- PSO2** : Perform and optimize food processing and preservation techniques to enhance shelf life, safety, and product stability
- PSO3** : Develop innovative food products using scientific formulation, sensory evaluation, and pilot-scale testing approaches
- PSO4** : Apply food safety standards, quality assurance systems, and regulatory frameworks in food production and processing environments
- PSO5** : Design and manage food supply chains, post-harvest systems, and processing operations for efficiency and sustainability
- PSO6** : Integrate biotechnological and advanced processing concepts to improve food functionality, sustainability, and industrial applications

PSO Alignment with Core Courses and Skill Competencies

PSO No	Programme Specific Outcome	Supporting Core Courses	Skill Competency
PSO1	Apply principles of food chemistry, microbiology, and biochemistry to evaluate food composition, quality changes, and safety parameters across processing systems	Food Chemistry, Food Microbiology, Integrative Human Physiology and Biochemistry	Analytical interpretation, laboratory competency, food quality evaluation
PSO2	Perform and optimize food processing and preservation techniques to enhance shelf life, safety, and product stability	Food Processing and Preservation, Food Packaging Technology, Food Processing Equipment and Operations	Processing skills, operational efficiency, technology application
PSO3	Develop innovative food products using scientific formulation, sensory evaluation, and pilot-scale testing approaches	Food Product Development, Bakery and Confectionery Technology, Food Analysis Practical	Product innovation, formulation skills, sensory and quality assessment
PSO4	Apply food safety standards, quality assurance systems, and regulatory frameworks in food production and processing environments	Food Safety and Quality Assurance, Food Microbiology, Food Analysis Practical	HACCP application, quality control, regulatory compliance
PSO5	Design and manage food supply chains, post-harvest systems, and processing operations for efficiency and sustainability	Post Harvest Technology, Supply Chain Management, Principles of Management and Marketing	Supply chain optimization, resource management, decision-making
PSO6	Integrate biotechnological and advanced processing concepts to improve food functionality, sustainability, and industrial applications	Food Biotechnology, Technology of Dairy and Meat Processing, Advanced Non-Thermal Food Processing	Bioprocessing skills, innovation in processing, industrial application

SCHEME OF EXAMINATION

Sem	Part	Course Code	Course Title	Course Type	Hours / Week	Credits	Examination			
							Duration in Hours	Maximum Marks		
								CA	ESE	TOTAL
I	I	TAM2601A	Tamil Paper I	AEC	4	3	3	25	75	100
		HIN2601A	Hindi Paper I							
		FRE2601A	French Paper I							
	II	ENG2601A	English Paper I	AEC	4	3	3	25	75	100
	III	BF26C01	Core I: Food Science	DSC	4	4	3	25	75	100
		BF26C02	Core II: Food Chemistry	DSC	5	5	3	25	75	100
		BF26CP1	Core Practical I: Food Science and Chemistry Practical	DSC	3	2	3	25	75	100
		BF26A01	Generic Elective I: Principles of Food and Nutrition	MDC	5	4	3	20	55	75
		BF26AP1	Generic Elective Practical I: Nutrition and Health Assessment Practical		3	-		-	-	-
	IV	NME26B1	Basic Tamil I	AEC	2	2	-	100*		100
		NME26A1	Advanced Tamil I							
		NME26ES	Introduction to Entrepreneurship	VAC						
I - II	VI	NM26GAW	General Awareness	VAC	SS	-	-	-	-	-
I - II		COM26SER	Community Services 30 Hours	VAC	-	-	-	-	-	-
I - V		26BONL1 26BONL2 26BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-
Semester I Total					30	23				675
II	I	TAM2602A	Tamil Paper II	AEC	4	3	3	25	75	100
		HIN2602A	Hindi Paper II							
		FRE2602A	French Paper II							
	II	ENG2602A	English Paper II	AEC	4	3	3	25	75	100
	III	BF26C03	Core III: Food Microbiology	DSC	4	3	3	25	75	100
		BF26C04	Core IV: Integrative Human Physiology and Biochemistry	DSC	5	3	3	25	75	100

		BF26CP2	Core Practical II: Nutritional Biochemistry Practical	DSC	3	2	3	25	75	100
		BF26A02	Generic Elective II: Community and Public Health Nutrition	MDC	5	4	3	20	55	75
		BF26AP1	Generic Elective Practical I: Nutrition and Health Assessment Practical		3	3		15	35	50
	IV	NME26B2	Basic Tamil II	AEC	2 ^e	Gr.		100*	-	100
		NME26A2	Advanced Tamil II							
		NM26UHR	Universal Human Values and Human Rights	VAC	2	2	-	100*	-	100
	I - II	NM26GAW	General Awareness	VAC	SS	Gr.	-	100*		100
	I - II	COM26SER	Community Services 30 Hours	VAC	-	St.	-	-	-	-
	I - V	26BONL1 26BONL2 26BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-
Semester II Total					30	23				825
III	I	TAM2603A	Tamil Paper III	AEC	4	3	3	25	75	100
		HIN2603A	Hindi Paper III							
		FRE2603A	French Paper III							
	II	ENG2603A	English Paper III	AEC	4	3	3	25	75	100
	III	BF26C05	Core V: Food Processing and Preservation	DSC	4	3	3	25	75	100
		BF26C06	Core VI: Bakery and Confectionery Technology	DSC	5	4	3	25	75	100
		BF26CP3	Core Practical III: Food Preservation Practical	DSC	3	2	3	25	75	100
		BF26A03	Generic Elective III: Family Meal and Food Service Management	MDC	4	3	3	20	55	75
		BF26AP2	Generic Elective Practical II: Family Meal and Food Service Management Practical	MDC	3	2	-	15	35	50
		BF26INST1	Field work/ Institutional Training (30 Days)	VAC	-	2	-	100*	-	100
	IV	NM26DRM	Disaster Risk Reduction and Management	SEC	3	3	-	100*	-	100
		NM26HAW	Health and Wellness ^e	VAC		1	-	100*	-	100
I - V	VI	26BONL1 26BONL2 26BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-

Semester III Total					30	26				925
IV	I	TAM2604A	Tamil Paper IV	AEC	4	3	3	25	75	100
		HIN2604A	Hindi Paper IV							
		FRE2604A	French Paper IV							
	II	ENG2604A	English Paper IV	AEC	4	3	3	25	75	100
	III	BF26C07	Core VII: Food Packaging Technology	DSC	5	4	3	25	75	100
		BF26C08	Core VIII: Food Biotechnology	DSC	4	3	3	25	75	100
		BF26CP4	Core Practical IV: Food Processing and Food Bioprocessing Practical	DSC	3	2	3	25	75	100
		BF26A04	Generic Elective IV: Fundamentals of Research	MDC	5	3	3	20	55	75
	IV	BF26SECE	Digital Marketing Specialization	SEC	3	3	-	100*	-	100
		NM26EII	Entrepreneurship and Innovation (IgniteX)	VAC	2	2	-	100*	-	100
		NM26EVS	Environmental Studies	VAC	SS	Gr.	-	100*	-	100
V	26COACT	Co-Curricular Activities	VAC	-	1	-	100*	-	100	
I - V	VI	26BONL1 26BONL2 26BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-
Semester IV Total					30	24				975
V	III	BF26C09	Core IX: Post Harvest Technology	DSC	5	3	3	25	75	100
		BF26C10	Core X: Food Product Development	DSC	4	3	3	25	75	100
		BF26C11	Core XI: Principles of Management and Marketing	DSC	4	3	3	25	75	100
		BF26CP5	Core Practical V: Food Product Development and Marketing Practical	DSC	4	3	3	25	75	100
		BF26CP6	Core Practical VI: Food Analysis Practical	DSC	3	-	-	-	-	-
		BF26E01	Elective I: Convenience Foods (OR)	DSE	5	4	3	25	75	100
		BF26E02	Elective I: Food Toxicology							
		BF26AC1	Advance Learner Course I: Advanced Non Thermal Food Processing (OR)	ACC	SS	5^	3	25	75	100^

B. Sc Food Processing Technology and Management – Scheme and Syllabus, 2026 Regulations

		BF26AC2	Advance Learner Course I: Nutritional Epidemiology and Food Policies							
	IV	BF26SE01	Food Processing Equipment and Operations	SEC	3	2	-	100*	-	100
		NM26CS1	Cyber Security I	VAC	2	Gr.	-	100*	-	100
		BF26INST2	Field work/ Institutional Training (30 Days)	VAC	-	2	-	100*	-	100
	VI	BF26COM	Comprehensive Examination	DSC	-	Gr.	-	100*	-	100
I - V	VI	26BONL1 26BONL2 26BONL3	Online Course I Online Course II Online Course III	ACC	-	Cr. ^ /St.	-	-	-	-
Semester V Total					30	20				900
VI	III	BF26C12	Core XII: Supply Chain Management	DSC	4	3	3	25	75	100
		BF26C13	Core XIII: Food Safety and Quality Assurance	DSC	5	3	3	25	75	100
		BF26C14	Core XIV: Technology of Dairy and Meat Processing	DSC	5	4	3	25	75	100
		BF26CP7	Core Practical VII: Food Analysis Practical	DSC	3	3	3	25	75	100
		BF26E03	Elective II: Food Plant Layout and Design (OR)	DSE	5	3	3	25	75	100
		BF26E04	Elective II: Food Waste Management							
	IV	BF26SE02	Food Processing Automation and Digitalization	SEC	3	3	-	100*	-	100
	III	BF26PROJ	Project and Viva-voce	DSE	5	5	-	25	75	100
	III	BF26AC3	Advance Learner Course II: Nutritional Management in Health and Fitness (OR)	ACC	SS	5^	3	25	75	100^
		BF26AC4	Advance Learner Course II: Allergen Management in Food Industry							
Semester VI Total					30	24				700
I-VI	Total					140 + Additional Credits				5000+ Marks for Additional Credit Courses

Hours of Instructions is inclusive of lectures, seminars, presentations, case-studies, etc

Symbols and Notations

Symbols	Notations
*	Course assessed through Internal Assessment (CIA) only
Gr.	Grade awarded based on CBCS grading system
St.	Course Status (Completed/Not Completed)
^	Advanced Learner Course, Online Courses – Additional Credit Courses
@	Course assessed through End Semester Examination (ESE) only
#	Open Book Examination
\$	Evaluation Pattern converted from 25:75:100 to 20:55:75 (CIA:ESE:Total) structure
\$\$	Evaluation Pattern converted from 25:75:100 to 15:35:50 (CIA:ESE:Total) structure
€	Hours per Week Outside Class Hours
£	Marks are not considered for the calculation of total marks

Abbreviation	Course Type
DSC	Discipline Specific Core Courses
DSE	Discipline Specific Elective Courses
MDC	Multidisciplinary Courses
AEC	Ability Enhancement Course
SEC	Skill Enhancement Course
VAC	Value Added Courses
ACC	Additional Credits Courses

Assessment and Evaluation Framework
Continuous Internal Assessment (CIA) – 25%

Component	Activities Included
Internal Tests	Periodic written tests
Assignments / Case Studies	• Written assignments • Case analysis reports • Article reviews • Literature review tasks • Data interpretation exercises • Policy analysis (Arts & Humanities) • Business case studies (Commerce & Management) • Lab-based analytical reports (Science)
Seminars / Presentations	• PowerPoint presentations • Poster presentations • Panel discussions • Group seminars • Viva voce • Digital presentations using multimedia tools • Peer evaluation rubrics
ICT-based Tasks	• Spreadsheet analysis • Accounting software / statistical software • Online quizzes • Simulation tools • E-content creation • Coding platforms (for relevant disciplines)
Projects / Field Reports	• Field surveys • Industry visits • Internship reports • Mini-projects • Laboratory experiments • Community-based research • Data collection & statistical analysis • Reflective journals

End Semester Examination (ESE) – 75%

Component	Description
Written Examination	3-hour written examination covering all CLOs
Cognitive Levels	Questions aligned with multiple Bloom's Taxonomy (K-levels)
Professional Conduct	Ethical and professional conduct during examination
Academic Compliance	Timely submission and participation as per regulations

Assessment Components Aligned with Blooms Levels

EXAMINATION SYSTEM

Semester system will be followed. A semester consists of a minimum of 90 working days excluding the days of conduct of ESE. There will be Continuous Internal Assessment (CA) to evaluate the performance of students in each course and the End Semester Examination will be held at the end of every semester. Marks for ESE and CA with reference to the maximum marks for the courses will be as follows:

Max. Marks	CA	ESE
100	25	75
75	20	55
50	15	35

A. Bloom's levels are followed in question papers and aligned with CLOs and CA components.

Remember	-	K1
Understand	-	K2
Apply	-	K3
Analyze	-	K4
Evaluate	-	K5
Create	-	K6

B. Continuous Internal Assessment CA

The weightage assigned to various components of the CA is as follows

Undergraduate Programmes

a. Theory

AEC (Language, English), DSC (Core, Elective) & MDC (GE-Allied)

CA Components	Marks	K level
CIA Test	5 Marks (Conducted for 45 marks after 50 days – 3 units)	K1 to K6 as per QP Pattern
Model Exam	7 Marks (Conducted for 75 marks after 85 days - Each Unit 15 Marks)	
Seminar	4 Marks	K6
Assignment	4 Marks	K5
ICT (Quiz)	2 Marks	K2
Attendance	3 Marks (Attendance 75% - 80% - 1 Mark, 81% - 90% - 2 Marks, 91% - 100% - 3 Marks)	
Total	25 Marks	

For Science allied courses with theory as 75 marks, the split-up is 20 marks as internal and 55 as external. Internal conducted for 25 and converted to 20 marks and external conducted for 75 and converted to 55 marks.

b. *Practical*

CA Components	Marks	K level
Lab Performance	7 Marks	K4
Internal Viva Voce	5 Marks	K4
Model Exam	10 Marks	K5
Attendance	3 Marks	
Total	25 Marks	

For practical courses with 50 marks as ESE, the split-up is 15 marks as internal and 35 as external. Internal conducted for 25 and converted to 15 marks and external conducted for 75 and converted to 35 marks.

c. *Skill Enhancement Courses*

Theory courses

CA Components	Marks	K level
Test I	30 Marks (Conducted for 45 marks and converted to 30 Marks – 3 Units)	K2 to K6 as per QP Pattern
Test II	50 Marks (Conducted for 75 marks after 85 days - Each Unit 15 Marks)	
Assignment	10 Marks	K5
Seminar	10 Marks	K6
Total	100 Marks	

Practical Courses

CA Components	Marks	K level
Practical exam	80 Marks (Practical Execution: 65 Marks, Record : 15 Marks)	K5
Lab Performance	10 Marks	K4
Internal Viva Voce	10 Marks	K4
Total	100 Marks	

Theory and Practical

CA Components	Marks	K level
Test I (Theory)	30 Marks (Conducted for 45 Marks and converted to 30 Marks)	K2 – K6
Test II (Practical)	50 Marks (Practical Execution: 40 Marks, Record : 10 Marks)	K5
Lab Performance	10 Marks	K4
Internal Viva Voce	10 Marks	K4
Total	100 Marks	

Theory and Project

CA Components	Marks	K level
Test I (Theory)	30 Marks (Conducted for 45 Marks and converted to 30 Marks)	K2 – K6
Project Examination	30 Marks	K5
Internal Viva Voce	40 Marks	K4
Total	100 Marks	

d. Project: Individual / Group Project

Components	Marks	K level
Continuous Internal Assessment (CA)	25 Marks	K3, K4, K6
End Semester Examination	75 Marks	K5, K6
Total	100 Marks	

Continuous Internal Assessment (CA)

CA Components	Marks	K level
I Review - Project Proposal Presentation	5 Marks	K3
II Review - Periodic Review-Progress Evaluation	10 Marks	K4
III Review - Project Report Draft Submission	10 Marks	K6
Total	25 Marks	

End semester examination

Components	Marks	K level
Evaluation of the Project Report	25 Marks	K6
Viva Voce	50 Marks	K5
Total	75 Marks	

e. ***Introduction to Entrepreneurship / Women Studies / Universal Human Values and Human Rights / Environmental Studies / Cyber Security I***

CA Components	Marks	K level
ICT (Quiz)	50 Marks	K2
Assignment	25 Marks	K5
Project / Case study / Poster	25 Marks	K6
Total	100 Marks	

f. ***Entrepreneurship and Innovation (IgniteX)***

CA Components	Marks	K level
ICT (Quiz)	50 Marks (3 Quizzes each quiz 25 marks, 75 marks converted to 50 marks)	K2
ICT (Pitch Deck Presentation)	20Marks	K6
Assignment	30 marks (30 Venture Activities)	K5
Total	100 Marks	

g. ***Advanced Tamil & Basic Tamil***

Components	Marks	K level
CIA	25 Marks (conducted for 45 marks after 50 days)	K1 to K6 as per QP Pattern
Model	50 marks (conducted for 75 marks after 85 days)	
ICT (Quiz)	15Marks	K2
Assignment	10 Marks	K5
Total	100 Marks	

h. **General Awareness / Comprehensive Examination / Co-Curricular Activities / Community Services**

Course Title	Marks	K level
General Awareness	100	K3
Comprehensive Examination	100	K3
Co-Curricular Activities	100	K6
Community Services	St.	K6

i. **Field Work / Institutional Training:**

CA Components	Marks	K level
Work diary	15 Marks	K3
Report	50 Marks	K6
Viva Voce	25 Marks	K5
Attendance	10 Marks	
Total	100 Marks	

j. **Advance learner Course:**

CA Components	Marks	K level
Test 1	10 Marks (conducted for 45 marks after 50 days – 3 units)	K1 to K6 as per QP Pattern
Model Exam	15 Marks (Conducted for 75 marks after 85 days (Each Unit 15 Marks))	
Total	25 Marks	

Postgraduate Programmea. **Core and Elective (Including Course with Open Book Examination)**

CA Components	Marks	K Level
CIA Test	5 Marks (conducted for 45 marks after 50 days – 3 units)	K2 to K6 as per QP Pattern
Model Exam	7 Marks (Conducted for 75 marks after 85 days) (Each Unit 15 Marks)	
Seminar	4 Marks	K6
Assignment	4 Marks	K5
ICT (Quiz)	2 Marks	K2
Attendance	3 Marks (Attendance 75% - 80% - 1 Mark, 81% - 90 % - 2 Marks, 91% - 100% - 3 Marks)	
Total	25 Marks	

b. Coursera in combination with Core Course:

CA Components	Marks	K Level	
Coursera	25 Marks (100 marks from Coursera converted to 25 marks)	K4	
CIA Test	25 Marks (conducted for 45 marks from Coursera converted to 25 marks)	K2 to K6 as per QP Pattern	
Model Exam	30 Marks (conducted for 75 marks from Coursera converted to 30 marks)		
Assignment	10 Marks	K5	
Seminar	10 Marks	K6	
Total	100 Marks		

c. Practical

CA Components	Marks	K Level
Lab Performance	7 Marks	K4
Internal Viva-Voce	5 Marks	K4
Model Exam	10 Marks	K5
Attendance	3 Marks	
Total	25 Marks	

For practical courses with 50 marks as ESE, the split-up is 15 marks as internal and 35 as external. Internal conducted for 25 and converted to 15 marks and external conducted for 75 and converted to 35 marks.

d. Cyber Security II

CA Components	Marks	K Level
ICT (Quiz)	50 Marks	K2
Assignment	25 Marks	K5
Project / Case Study / Poster	25 Marks	K6
Total	100 Marks	

e. *Advance Learner Course*

CA Components	Marks	K Level
Test 1	10 Marks (conducted for 45 marks after 50 days – 3 units)	K2 to K6 as per QP Pattern
Model Exam	15 Marks (Conducted for 75 marks after 85 days (Each Unit 15 Marks))	
Total	25 Marks	

f. *Comprehensive Examination*

Course Title	Marks	K level
Comprehensive Examination	100	K3

g. *Project and Viva voce*

Components	Marks	K level
Continuous Internal Assessment (CA)	25 Marks	K3, K4, K6
End Semester Examination	75 Marks	K5, K6
Total	100 Marks	

Continuous Internal Assessment (CA)

CA Components	Marks	K Level
I Review - Project Proposal Presentation	5 Marks	K3
II Review - Periodic Review-Progress Evaluation	10 Marks	K4
III Review - Project Report Draft Submission	10 Marks	K6
Total	25 Marks	

End Semester Examination

Components	Marks	K level
Evaluation of the Project Report	25 Marks	K6
Viva Voce	50 Marks	K5
Total	75 Marks	

h. Summer Internship / Field Work / Institutional Training

CA Components	Marks	K Level
Work diary	15 Marks	K3
Report	50 Marks	K6
Viva Voce	25 Marks	K5
Attendance	10 Marks	
Total	100 Marks	

C. Schedule for CA Tests

One test for Continuous Assessment (3 Units) will be conducted on pre-determined date i.e., commencing on the 50th day from the date of reopening. The model exam (5 units) will be conducted after completing 85th working day.

D. Question Paper Pattern and Distribution of Marks for CA – UG

UG : Language, English, Core, Elective, Allied, ALC, Basic Tamil and Advanced Tamil - (First 3 Units)

Description	Marks	Number of questions in K level					
Questions from each unit comprising of		K1	K2	K3	K4	K5	K6
One question with a weightage of 2 Marks	3 X 2 = 6	1	2				
One question with a weightage of 5 Marks (Internal Choice at the same CLO level)	3 X 5 = 15			1	1	1	
One question with a weightage of 8 Marks (Internal Choice at the same CLO level)	3 X 8 = 24			1	1		1
Total	45 Marks						

Skill Enhancement Courses - UG

Description	Marks	Number of questions in K level					
Questions from each unit comprising of		K1	K2	K3	K4	K5	K6
One question with a weightage of 5 Marks (Internal Choice at the same CLO level)	3 x 5 =15		1	1	1	1	1
One question with a weightage of 10 Marks (Internal Choice at the same CLO level)	3 x 10 = 30			2	1	1	1
Total	45 Marks						

E. Model /End Semester Examination – Question Paper Pattern and Distribution of Marks***UG: Language, English, Core, Elective, Allied, ALC, Basic Tamil & Advanced Tamil***

Description	Marks	Number of questions in K level					
		K1	K2	K3	K4	K5	K6
Questions from each unit comprising of							
One question with a weightage of 2 Marks	5 x 2 = 10	2	3				
One question with a weightage of 5 Marks (Internal Choice at the same CLO level)	5 x 5 =25			2	2	1	
One question with a weightage of 8 Marks (Internal Choice at the same CLO level)	5 x 8 =40			2	1	1	1
Total	75 Marks						

ESE Practical Pattern (UG)

The End Semester Examination will be conducted for a maximum of 75 marks with a maximum 15 marks for the record and other submissions if any.

Practical Components	Marks	K level
Practical Execution	60 Marks	K5
Record	15 Marks	K2
Total	75 Marks	

Submission of Record note books for Practical Examinations

Submission of bonafide record note books is mandatory to appear for the practical examination. If a candidate is unable to submit the record note book on valid grounds, she may be permitted to appear for the practical examinations, provided the head of the department certifies that the candidate has performed the experiments prescribed for the course and she will be awarded zero (0) marks for record note book.

Rubrics for Assessments

Rubrics for Assessment

Standard 4-Level Performance Scale

Level	Descriptor	Score Range (Illustrative)
Level 4	Excellent	80–100% of component marks
Level 3	Good	60–79%
Level 2	Satisfactory	40–59%
Level 1	Needs Improvement	Below 40%

1. Theory

End Semester Examination (ESE)

Section	K-Level	Criteria	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Satisfactory)	Level 1 (Needs Improvement)
SEC A (Theory / Knowledge)	K1–K2	Knowledge recall & understanding	Thorough understanding across all required cognitive levels	Good understanding, minor gaps	Basic understanding, limited depth	Inadequate or incorrect understanding
SEC B (Application & Analysis)	K3–K5	Problem-solving, application of concepts, analytical reasoning	Accurately applies concepts, strong logical reasoning, handles problems independently	Mostly correct application, minor errors, reasonable reasoning	Partial application, procedural errors, limited reasoning	Unable to apply concepts, incorrect, poor reasoning
SEC C (Comprehensive / Higher-Order Tasks)	K3–K6	Analytical reasoning, creation, problem-solving, innovation	Clear logical reasoning, structured solutions, innovative or optimized solutions	Reasonable logic with minor gaps, mostly correct solutions	Limited reasoning, basic attempt at solution	Poor or no reasoning, incorrect or missing solutions

Continuous Internal Assessment (CIA)

Section	K-Level	Criteria	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Satisfactory)	Level 1 (Needs Improvement)
SEC A (Theory / Knowledge)	K1–K2	Knowledge recall & understanding	Thorough understanding across all required cognitive levels	Good understanding, minor gaps	Basic understanding, limited depth	Inadequate or incorrect understanding
SEC B (Application & Analysis)	K3–K5	Problem-solving, application of concepts, analytical reasoning	Accurately applies concepts, strong logical reasoning, handles problems independently	Mostly correct application, minor errors, reasonable reasoning	Partial application, procedural errors, limited reasoning	Unable to apply concepts, incorrect, poor reasoning
SEC C (Comprehensive / Higher-Order Tasks)	K3, K4, K6	Analytical reasoning, creation, problem-solving, innovation	Clear logical reasoning, structured solutions, innovative or optimized solutions	Reasonable logic with minor gaps, mostly correct solutions	Limited reasoning, basic attempt at solution	Poor or no reasoning, incorrect or missing solutions

2. Internal Components – Other Activities

Component	K-Level	Criteria	Level 4	Level 3	Level 2	Level 1
Assignment	K5	Application & Problem Solving	Strong solutions, accurate	Mostly correct	Partial	Incorrect / missing
Seminar / Presentation	K6	Creation, Communication & Analysis	Insightful, professional, confident	Good, minor gaps	Basic	Poor / incomplete
ICT Quiz	K2	Knowledge & Application	Accurate & confident	Mostly correct	Basic	Incorrect
Attendance	—	Participation & Punctuality	Full attendance, punctual	Mostly present	Occasional	Poor / frequently absent

3. Practical

Continuous Internal Assessment (CIA)

Component	Bloom's Level	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Satisfactory)	Level 1 (Needs Improvement)
Model Practical (Converted to 10)	K5	Independent execution, accurate results, strong analysis, handles unexpected issues confidently	Minor errors, mostly accurate, guided problem-solving	Performs with guidance, partial understanding, limited analysis	Unable to perform, inaccurate results, no reasoning
Internal Viva	K4	Strong conceptual knowledge, clear reasoning, confident troubleshooting	Good understanding, minor gaps, can handle problems with guidance	Basic understanding, limited problem-solving	Weak knowledge, unable to respond or reason
Lab Performance	K4	Active participation, consistent improvement, skillfully applies concepts	Mostly regular participation, moderate improvement	Irregular, minimal improvement	Rarely participates, no skill growth
Attendance	—	Full attendance, punctual	Mostly present	Occasionally absent	Frequently absent

End Semester Practical Examination (ESE)

Component	Bloom's Level	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Satisfactory)	Level 1 (Needs Improvement)
Practical Execution	K5	Accurate execution, proper procedure, precise results, handles unexpected issues confidently	Minor errors, mostly correct, can handle problems with help	Multiple errors, partial results, limited troubleshooting	Incorrect procedure, unable to execute, fails completely
Record Verification	K2	Complete experiments, accurate results, correct interpretation, neat & structured	Minor omissions, minor errors, mostly clear	Incomplete, errors present, basic clarity	Very incomplete, incorrect, untidy
External Viva	K4	Strong theoretical knowledge, clear understanding & application, confident reasoning	Good understanding, minor gaps, partial application	Basic knowledge, limited linkage to experiment	Weak knowledge, unable to explain or apply concepts

4. Projects

Continuous Internal Assessment (CIA)

Component	Bloom's Level	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Satisfactory)	Level 1 (Needs Improvement)
Project Proposal Presentation	K3	Clear, focused problem definition; well-defined objectives; feasible plan; confident presentation	Minor gaps in clarity or planning; mostly clear	Broad or partially defined problem; basic objectives; basic presentation	Vague/unclear problem; objectives missing; poor presentation
Periodic Review / Progress Evaluation	K4	Consistent, timely progress; correct application; identifies & resolves issues independently; systematic documentation; proactive	Minor delays, minor guidance needed, mostly updated documentation; moderately proactive	Irregular progress, partial application, needs support, basic documentation	Very limited progress, incorrect application, passive, poor documentation
Project Report Draft Submission	K6	Well-structured report; accurate understanding; adequate data; logical analysis; proper referencing & presentation	Minor structural or conceptual gaps; minor data issues; reasonable analysis; minor formatting issues	Basic structure; partial understanding; limited data; basic analysis; basic formatting	Poorly organized; incorrect understanding; insufficient data; no analysis; poor presentation

End Semester Examination (ESE)

Component	Bloom's Level	Level 4 (Excellent)	Level 3 (Good)	Level 2 (Satisfactory)	Level 1 (Needs Improvement)
Final Project Report Evaluation (External)	K6	Topic relevant & meaningful; accurate application of concepts; adequate & relevant data; logical analysis; effective problem-solving; professional formatting	Mostly relevant; minor conceptual errors; minor gaps in data; mostly logical; reasonable solutions; minor formatting issues	Moderately relevant; basic application; limited data; basic analysis; basic problem-solving; basic formatting	Poor relevance; incorrect application; insufficient data; weak analysis; no solution; poor formatting
External Viva Voce	K5	Thorough understanding; strong linkage to project; logical reasoning; confident & accurate responses; professional communication	Minor gaps in understanding or reasoning; mostly correct answers; acceptable communication	Basic understanding; limited linkage; basic reasoning; limited answers; basic communication	Weak understanding; no linkage; no reasoning; unable to respond; poor communication

Course Code	Course Title	Hours			Credits
		Total	Lecture	Examination	
BF26C01	Core I Food Science	60	55	5	4

Preamble

- Forms the scientific foundation on the fundamental concepts of food science including composition, classification, cooking methods, and functions of food.
- Provides knowledge of major food groups, their nutritive value, processing, and role in health and well-being.
- Explores the effect of cooking methods, processing conditions and builds understanding of physicochemical and biochemical reactions in foods
- Integrates concepts of Industry 4.0 including smart food processing through simple automation and modern cooking technologies
- Emphasizes analytical thinking, practical skills, and application of scientific principles in food preparation and processing

Prerequisite

Basic knowledge of general biology, including basic chemistry, and fundamentals of nutrition at the higher secondary level.

Course Learning Outcomes (CLOs)

On the successful completion of the course, students will be able to,

CLO No	Course Learning Outcome	Bloom's Level
CLO1	List the classification, structure, composition, and nutritive value of major food groups including cereals, pulses, fruits, vegetables, meat, fish, milk, eggs, and sugars.	K1
CLO2	Explain and compare cooking methods, physicochemical changes, and functional properties of food components.	K2
CLO3	Apply knowledge of food composition and appropriate cooking techniques to modify processing characteristics and nutritional properties of different foods.	K3

CLO4	Analyze biochemical and physical changes and evaluate quality, composition, and processing effects of various foods	K4
CLO5	Design strategies using Industry 4.0 tools to improve food quality, shelf-life, and sustainability.	K5
CLO6	Develop simple food preparation strategies to enhance quality and nutritive value in relation to health and real-world food system challenges	K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create		

Evaluate the nutritional quality and functional roles of different food groups food preparation practices.

Unit-Wise – CLO Mapping

Unit	Coverage	Mapped CLOs
Unit I	Introduction to Food Science, Cooking methods, Physicochemical changes in foods	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit II	Cereals, Pulses, Nuts and Oilseeds	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit III	Vegetables, Fruits and Spices	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit IV	Meat, Fish and Poultry	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit V	Egg, Milk and Sugar	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6

Alignment of CLO with PLO

3 = High, 2 = Medium, 1 = Low

CLO \ PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1	3	2	2	1	2	1	1	2	1	1	2	1
CLO2	3	2	2	1	2	1	1	2	1	1	2	1
CLO3	3	3	3	2	2	2	2	2	1	1	3	1
CLO4	3	3	3	2	2	2	2	2	1	1	3	1
CLO5	3	3	3	2	3	2	2	3	1	1	3	1
CLO6	3	3	3	2	3	2	2	3	1	1	3	2

Food Science (BF26C01)

55 Hours

Unit I

12 Hours

Food Science

Introduction to food science – definition, functions of food, Classification of foods, food groups, food pyramid, and food in relation to health.

Cooking –objectives, preliminary preparations; Cooking methods – moist heat methods, dry heat methods, Combination methods – braising and microwave cooking; Recent methods-Ohmic cooking; Advantages and Disadvantages of cooking methods; Ancient cooking techniques and health benefits: Slow cooking (dum), tempering (tadka).

Factors affecting cooking of foods, Moist heat effect- Gelatinization, Gel formation, Retrogradation & Syneresis; Dry heat effect- Dextrinization; Factors affecting gel formation, denaturation, colloids, emulsion, foam and factors affecting foam formation and stability, fermentation, browning, rancidity.

Unit II

11 Hours

Cereals, Pulses, Nuts and Oilseeds

Cereals and cereal products – structure, composition and nutritive value of wheat, rice, maize, jowar, ragi, bajra; Cereal starch –Types of starch, effect of moist heat and dry heat.

Pulses – composition and nutritive value, classification, toxic constituents, Effect of cooking and factors affecting cooking of pulses; Pulse cookery

Nuts & oil seeds – composition and nutritive value of coconut, flax seeds, almonds, groundnut, soya bean, sunflower seeds. Fats and oil- Refining of oils, Effect of heat on oil and Rancidity

Unit III

10 Hours

Vegetables and Fruits and Spices

Vegetables and Fruits – Classification, composition and nutritive value, selection, pigments, enzymes, flavor compounds - bitter compound, Phytochemicals; ripening of fruits; Browning: - enzymatic and non-enzymatic browning, prevention of browning; Changes and effect of cooking.

Spices – Composition, medicinal values, potential health benefits and role of spices in cookery.

Unit IV

11 Hours

Meat, Fish and Poultry

Meat – classes of meat and related products, composition and nutritive value, post-mortem changes, ageing, tenderizing, curing, cuts, grades and meat cookery, Changes during cooking, methods of cooking

Fish- classification, composition and nutritive value, selection of fish, fish products, fish protein concentrate.

Poultry – classification, composition and nutritive value.

Unit V

11 Hours

Egg, Milk and Sugar

Egg- Structure, composition, nutritive value, egg quality grading, effect of heat on egg proteins, functions of egg in cookery.

Milk- Composition, nutritive value, properties, effects of heat on milk, milk cookery and products and indigenous milk products

Sugar- Properties, sugar and related products, stages of sugar cookery, factors affecting crystallization; Sugar cookery and artificial sweeteners

Industry 4.0 :- Introduction to Industry 4.0 -smart food processing and automation, use of sensors shelf-life improvement and waste reduction

*** Course Alignment with SDGs: 2, 3, 12**

Text Books

S. No	Authors	Title	Publishers	Year & Edition
1.	Srilakshmi, B	Food Science	New Age International (P) Ltd. Publishers, New Delhi.	2024 & 8 th edition
2.	Robert L. Shewfelt, Jerry W. H. O'Donnell.	Food Science: An Ecological Approach	CRC Press	2021 & 1 st edition,
3.	Sarah J. L. Sutherland, Daniel M. Tomlins	Food Science: From Farm to Table	CRC Press	2021 & 1 st edition

Reference Books

S. No	Authors	Title	Publishers	Year & Edition
1.	Brian P. Murphy, Sheila R. Dillon	Food Science - An Introduction to the Science of Food and Nutrition	John Wiley & Sons	2021 & 1 st edition
2.	Rick Parker	Introduction to Food Science	Cengage Learning	2021 & 4 th edition
3.	Michael J. Leubke, Michael R. Clark	Principles of Food Science and Technology	CRC Press	2022 & 1 st Edition

Related Online References

S. No.	Topics	Links
1.	Food Science – Methods of cooking	https://www.youtube.com/watch?v=u7sQjOFFISw
2.	Cereals and Millets and their products	https://www.youtube.com/watch?v=YfC4YGxagO8
3.	Enzymatic Browning in Fruits and Vegetables	https://www.youtube.com/watch?v=sCgcDyfafmM
4.	Preparing And Cooking Meat Part 2 Methods of Tenderizing Meat	https://www.youtube.com/watch?v=9h7Q62thXGg
5.	Uses of Egg in Cookery	https://www.youtube.com/watch?v=53Lpp6S6SpM

Pedagogy

The course will be delivered using a combination of traditional and learner-centered teaching methods, including:

- Lecture - Chalk and Talk
- PowerPoint presentations
- E-content and digital learning resources
- Group discussions
- Assignments
- Quizzes
- Peer learning activities
- Student seminars

Course Code & Title	BF26C01 & Food Science
Course Designers	Dr.N.Deepa Sathish, Dr. R. Pragatheeswari, Dr. R. Sivasankari

Course Code	Course Title	Hours			Credits
		Total	Lecture	Examination	
BF26C02	Core II Food Chemistry	75	70	5	5

Preamble

- Establishes a strong scientific foundation for understanding the composition, structure, and functional behaviour of food components during processing and storage.
- Introduces fundamental chemical principles governing the interactions and transformations of food constituents in complex food systems.
- Focuses on the structure, properties, and reactions of carbohydrates, proteins, lipids, vitamins, minerals, water, and enzymes.
- Explores physicochemical changes occurring during food processing, preparation, and storage, and their impact on quality, stability, and nutritional value.
- Enables students to interpret food transformations and apply this knowledge in food processing, quality control, and product development.

Prerequisite

Students are expected to possess basic knowledge of chemistry, physics and fundamentals of food science studied at the higher secondary level.

Course Learning Outcomes (CLOs)

On the successful completion of the course, students will be able to,

CLO No	Course Learning Outcome	Bloom's Level
CLO1	Recall the classification, structure, and fundamental properties of major food components including carbohydrates, proteins, lipids, vitamins, minerals, enzymes, and water.	K1
CLO2	Explain the chemical reactions and functional properties of food components during processing and storage.	K2
CLO3	Apply principles of food chemistry to interpret changes in food components during processing operations.	K3
CLO4	Analyze the interactions and transformations of food constituents affecting quality, stability, and functionality.	K4

CLO5	Evaluate the impact of processing conditions on the chemical stability, nutritional quality, and functional properties of foods.	K5
CLO6	Design basic experimental or processing approaches utilizing food chemistry principles to improve food quality and stability.	K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create		

Unit-wise CLO Mapping

Unit	Coverage	Mapped CLOs
Unit I	Chemistry of Carbohydrates and Water	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit II	Chemistry of Protein	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit III	Chemistry of Lipids	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit IV	Chemistry of Vitamins and Minerals	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit V	Enzymes in Food Systems	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6

Alignment of CLO with PLO

3 = High, 2 = Medium, 1 = Low

CLO \ PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1	3	1	1	1	1	1	1	2	1	1	1	1
CLO2	3	1	2	1	1	1	1	1	1	1	1	1
CLO3	3	2	1	1	1	1	1	1	1	1	2	1
CLO4	3	1	2	1	1	1	2	1	1	1	1	1
CLO5	2	1	3	1	2	1	1	1	1	1	1	2
CLO6	2	3	1	2	2	2	1	1	2	2	2	1

Food Chemistry (BF26C02)

70 Hours

Syllabus

Unit I

14 Hours

Chemistry of Carbohydrates and water

Carbohydrates - Occurrence, classification and functions in foods - Structure and properties of Monosaccharides, Disaccharides and Polysaccharides. Isomerism in sugars, Mutarotation and its significance. Chemical reactions – Hydrolysis, Oxidation and reduction, Caramelization and Maillard reaction. Changes of carbohydrates during processing.

Water - Moisture in Foods, Hydrogen Bonding, Bound Water, Water and its interaction with food components and food stability, Water Activity in Foods, True Solutions, Dispersions and Sols

Unit II

14 Hours

Chemistry of Proteins

Classification - simple, conjugated, derived proteins. Amino acids - Structure and classification. Peptide bonds and protein structure levels. Functional properties – Solubility, Water holding capacity, Foaming and emulsification, Gelation. Changes in proteins during processing.

Unit III

14 Hours

Chemistry of lipids

Classification - Simple lipids, compound lipids, derived lipids. Fatty acids - Saturated, unsaturated, cis-trans isomerism, Essential fatty acids (omega-3, omega-6). Triglyceride structure, Functions of lipids. Physical and chemical characteristics of lipids. Processing of fats - Hydrogenation and its effects (trans fats), Inter esterification, Fractionation. Deterioration: Oxidative rancidity, Hydrolytic rancidity and Role of antioxidants. Lipid oxidation control methods

Unit IV

15 Hours

Chemistry of vitamins and minerals

Vitamins: Introduction, Structure- Fat and Water soluble vitamins, Functions and biochemical roles, Stability during processing - Heat, light, oxygen sensitivity. Losses during cooking, storage, and preservation. Fortification and enrichment of foods

Minerals: Introduction, Properties of Major (Ca, P, Na, K, Mg) and Trace (Fe, Zn, I, Se). Functions in body and food systems. Bioavailability and influencing factors. Mineral interactions (e.g., calcium–phosphorus balance). Effect of processing – Leaching, Retention during cooking

Unit V**13 Hours****Enzymes in food systems**

Definition and classification of enzymes. Structure and properties of enzymes. Mechanism of enzyme action (lock and key, induced fit), Enzyme kinetics, Factors affecting enzyme activity, Role of Enzymes in Foods

*** Course Alignment with SDGs: 2, 3, 6, 9, 12**

Text Books

S. No.	Authors	Title	Publisher	Year & Edition
1	Fennema, O. R.	Fennema's Food Chemistry	CRC Press	2023 & 5 th Edn.
2	Damodaran, S., Parkin, K. L.	Fennema's Food Chemistry	CRC Press	2022 & 5 th Edn.
3	Belitz, H. D., Grosch, W., Schieberle, P.	Food Chemistry	Springer	2020 & 5 th Edn.
4	Manay, N. S., Shadaksharaswamy, M.	Food Facts and Principles	New Age International	2022 & 4 th Edn.
5	Fennema, O. R.	Fennema's Food Chemistry	CRC Press	2023 & 5 th Edn.

Reference Books

S. No.	Authors	Title	Publisher	Year & Edition
1	Rao, M. A.	Engineering Properties of Foods	CRC Press	2022 & 5 th Edn.
2	Barbosa-Canovas, G. V., Ortega-Rivas, E.	Food Structure Engineering: Processing, Properties and Applications	Wiley-Blackwell	2023 & 1 st Edn.
3	Gorton, L., Tornberg, E., and Johansson, L.	Food Processing: Principles and Applications	Wiley-Blackwell	2021 & 2 nd Edn.
4	Ramaswamy, H. S., and Mascheroni, R. H.	Food Process Engineering: Theory and Practice	CRC Press	2022 & 3 rd Edn.

Related Online References

S. No.	Topics	Links
1.	Chemistry of Carbohydrates and Water	https://www.youtube.com/watch?v=Q6k3zP9dQ9k
2.	Chemistry of Proteins	https://www.youtube.com/watch?v=zm-3kovWpNQ
3.	Chemistry of Lipids	https://www.youtube.com/watch?v=QhUrc4BnPgg
4.	Chemistry of Vitamins and Minerals	https://www.youtube.com/watch?v=ZL9Q7Q5k2dE
5.	Enzymes in Food Systems	https://www.youtube.com/watch?v=2f9rFZ3c9kQ

Pedagogy

The course will be delivered using a combination of traditional and learner-centered teaching methods, including:

- Lecture - Chalk and Talk
- PowerPoint presentations
- E-content and digital learning resources
- Group discussions
- Assignments
- Quizzes
- Peer learning activities
- Student seminars

Course Designers & Teaching–Learning Strategies

Course Code & Title	BF26C02 & Food Chemistry
Course Designers	Dr. R. Pragatheeswari, Dr. R. Sivasankari

Course Code	Course Title	Hours			Credits
		Total	Practical	Examination	
BF26CP1	Core Practical I : Food Science and Chemistry Practical	45	42	3	2

Preamble

- Introduces students to the fundamental principles of food science and chemistry through hands-on laboratory experiments.
- Focuses on the physical, chemical, and sensory properties of major food components such as carbohydrates, proteins, lipids, and enzymes.
- Provides practical exposure to food evaluation techniques, cooking characteristics, and functional properties of food materials.
- Develops essential experimental skills, along with systematic observation and interpretation of results in real food systems.
- Enhances analytical thinking and builds laboratory competencies required for applications in food technology.

Prerequisite

Basic knowledge of Food Science fundamentals, General Chemistry (organic and physical concepts) and laboratory safety and measurement techniques.

Course Learning Outcomes (CLOs)

On the successful completion of the course, students will be able to,

CLO No	Course Learning Outcome	Bloom's Level
CLO1	List the basic concepts of food composition, sensory evaluation, and cooking characteristics of food components	K1
CLO2	Explain the effects of heat, enzymes, and processing conditions on food constituents such as starch, proteins, and fats	K2
CLO3	Perform experiments to determine functional properties, gluten content, and cooking characteristics of various food samples	K3
CLO4	Analyze experimental results related to browning reactions, emulsions, and crystallization in food systems	K4
CLO5	Evaluate the quality and sensory attributes of foods based on experimental observations and standard procedures	K5

CLO6	Design and demonstrate a laboratory-based experiment to investigate food properties or processing effects	K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create		

Experiment - wise –CLO Mapping

Experiment No.	Coverage	Mapped CLOs
1-3	Sensory Evaluation and Cereal Chemistry	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
4-6	Flour Functionality and Pulse Processing	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
7-9	Pulse Germination and Vegetable Processing	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
10-12	Protein Foods and Lipid Functionality	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
13-15	Sugar Chemistry and Food Systems	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6

Alignment of CLO with PLO

3 = High, 2 = Medium, 1 = Low

CLO \ PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO 10	PLO 11	PLO 12
CLO1	3	1	1	2	1	1	1	2	1	1	1	1
CLO2	3	2	2	1	1	1	1	1	1	1	2	1
CLO3	3	3	2	1	1	2	1	1	1	1	1	1
CLO4	2	2	3	1	1	1	2	1	1	1	1	1
CLO5	2	1	3	2	1	1	1	1	1	1	1	1
CLO6	2	3	2	2	2	2	1	1	1	2	2	1

Food Science and Chemistry Practical (BF26CP1)**Total Hours: 42****Credit: 2**

1. Study on organoleptic evaluation of foods
2. Effect of dry heat and moist heat on starch granules
3. Determination of gluten content in wheat
4. Estimation of functional properties of flour.
5. Isolation of starch from given food sample
6. Cooking characteristics of pulses
7. Germination characteristics of pulses
8. Cooking characteristics of vegetables - effect of acid, alkali, heat and time
9. Study of enzymatic and non-enzymatic browning in fruits
10. Cooking characteristics of milk and its products.
11. Cooking characteristics of egg
12. Study the shortening effects of fats and oils during cooking
13. Stages of sugar crystallization
14. Determination of effect of taste thresholds of sugar, salt and acid on sensory perception
15. Study of Emulsion Properties in Ice Cream Mix

*** Course Alignment with SDGs: 2, 3, 4, 9 & 12****Text Books**

S. No	Authors	Title	Publishers	Year & Edition
1.	Vassilis Kontogiorgos	Introduction to Food Chemistry	Springer	2024 & 2 Edn.
2.	Tom Coultate	Food: The Chemistry of its Components	Royal Society of Chemistry	2023 & 7 Edn
3.	Ekhlaq Veg <i>et al.</i>	Basics of Food Chemistry	Book Rivers	2024 & 1 Edn
4.	IFT (Independent Authors)	Food Chemistry	Independently Published	2025 & 1 Edn
5.	O. P. Chauhan	Advances in Food Chemistry	Springer	2022 & 1 Edn

Reference Books

S. No.	Authors	Title	Publishers	Year & Edition
1.	Monisha Nath, Soma Das, Saheli Roy, Krishnendu Sahoo	A Laboratory Handbook of Food Chemistry	IIP Publishers	2024 & 1 Edn
2.	Peter Chi Keung Cheung & Bhavbhuti Mehta (Eds.)	Handbook of Food Chemistry	Springer	2025 & 1 Edn
3.	C. Anandharamakrishnan	Food Chemistry, Function and Analysis	Royal Society of Chemistry	2023 & 1 Edn

Related Online References

S. No.	Topics Covered	Links
1.	Sensory evaluation, taste thresholds, organoleptic analysis	https://www.youtube.com/watch?v=9kD9gWwK0Vg
2.	Carbohydrates (starch, sugar crystallization, browning reactions)	https://www.youtube.com/watch?v=1XKxWIYl6nA
3.	Proteins (gluten, egg, milk, functional properties)	https://www.youtube.com/watch?v=zm-3kovWpNQ
4.	Lipids, emulsions, cooking characteristics, enzymes in foods	https://www.youtube.com/watch?v=QhUrc4BnPgg

Course Designers & Teaching–Learning Strategies

Course Code & Title	BF26CP1 & Food Science and Chemistry Practical
Course Designers	Dr. N. Deepa Sathish, Dr.R.Pragatheeswari, Dr. R.Sivasankari

Course Code	Course Title	Hours			Credits
		Total	Lecture	Examination	
BF26A01	Generic Elective I: Principles of Food and Nutrition	75	70	5	4

Preamble

- Introduces basic principles of food and nutrition and their role in health and disease prevention.
- Explains nutrients, their sources, functions, digestion, and absorption.
- Covers recommended dietary allowances, meal planning, and dietary guidelines.
- Describes energy needs, nutrient deficiencies, and roles of vitamins, minerals, and water.
- Highlights the link between food, nutrition, and overall well-being.

Prerequisite

Students are expected to possess basic knowledge of biology, chemistry, and human physiology studied at the higher secondary level. Familiarity with basic concepts of food components and human health will help students understand nutrient metabolism, dietary requirements, and nutritional balance.

Course Learning Outcomes (CLOs)

On the successful completion of the course, students will be able to,

CLO No	Course Learning Outcome	Bloom's Level
CLO1	List the sources, functions, and deficiency of nutrients and RDA related to human nutrition.	K1
CLO2	Explain the concepts of nutrition, malnutrition, recommended dietary allowances, and principles of balanced diet and meal planning.	K2
CLO3	Apply principles of energy requirements, RDA, and meal planning to determine appropriate dietary patterns for different age groups and activity levels.	K3
CLO4	Analyse the digestion, absorption, and metabolic roles of carbohydrates, proteins, lipids, vitamins, minerals, and water in the human body.	K4
CLO5	Evaluate nutritional requirements and deficiency conditions based on menu and physiological needs and food intake and metabolic process	K5
CLO6	Design balanced customised diet plans based on RDA and health status of the special population group	K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create		

Unit-wise CLO Mapping

Unit	Coverage	Mapped CLOs
Unit I	Introduction to Nutrition and Meal Planning	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit II	Carbohydrates and Energy	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit III	Proteins, Lipids and Water	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit IV	Vitamins	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
Unit V	Minerals	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6

Alignment of CLO with PLO

3 = High, 2 = Medium, 1 = Low

CLO / PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1	2	1	1	1	1	1	1	2	2	2	1	1
CLO2	3	1	2	2	1	1	2	2	1	2	1	1
CLO3	3	2	2	2	2	1	1	1	1	1	2	1
CLO4	3	2	3	2	1	1	2	1	1	1	2	1
CLO5	2	1	3	2	2	1	2	1	2	1	2	2
CLO6	2	3	2	2	3	2	2	2	2	2	3	2

Principles of Food and Nutrition (BF26A01)

70 Hours

Unit I

14 Hours

Introduction to Nutrition and Meal planning

Food as source of nutrients, functions of food; Nutrition-Definition, importance and scope of nutrition, Relation of nutrition to health, Malnutrition, Nutritional Care and Nutritional Status. Recommended Dietary Allowances (RDA)-Significance and factors affecting RDA, Reference man and women. General concepts about growth and development and through different stages of life and RDA for Indians

Meal planning- Definition, Principles of meal planning, Basic five food groups, Balanced diet, Exchange lists, and factors affecting meal planning, Dietary Guidelines for different age group.

Unit II

14 Hours

Carbohydrates and Energy

Carbohydrate and Dietary fibre; -classification, functions, digestion and absorption, sources and requirements

Energy -Sources, physiological energy value of foods, thermogenic effect of foods; Basal Metabolic Rate (BMR) - factors affecting BMR and energy allowance for various activities

Unit III

14 Hours

Proteins, Lipids and Water

Proteins and Lipids- classification, functions, digestion and absorption, sources and requirements. Protein quality of foods - Protein Efficiency Ratio (PER), Biological Value (BV) and Net Protein Utilization (NPU).

Water-Daily requirement, Regulation and distribution of body water, Fluid Balance - Overhydration, Dehydration and water intoxication;

Unit IV

14 Hours

Vitamins

Fat soluble vitamins – vitamins A, D, E and K – functions, sources, requirements and deficiency. Water soluble vitamins (thiamine, riboflavin, niacin, pyridoxine, folic acid, cyanocobalamin, biotin, pantothenic acid and ascorbic acid) – functions, sources, requirements and deficiency

Unit V**14 Hours****Minerals**

Minerals – calcium, phosphorus, magnesium, sodium and potassium – functions, sources, requirements and deficiency. Minor and Trace minerals – iron, zinc, iodine, selenium, chromium, fluorine and chlorine – functions, sources, requirements and deficiency

*** Course Alignment with SDGs: 2, 3, 4, 6, 12**

Text Books

S. No	Authors	Title	Publishers	Year & Edition
1.	Srilakshmi, B	Nutrition Science	New age international Pvt. Ltd. New Delhi.	2022 & 8 th edition
2.	Sunil Kumar, Priyanka Agarwal	Nutrition Science: From Basics to Advanced	CRC Press	2022 & 1 st edition
3.	Sunil Kumar, Priyanka Agarwal	Nutrition Science: From Basics to Advanced	CRC Press	2021 & 1 st edition
4.	P. V. Satyanarayana, S. R. S. Reddy	Nutrition Science and Dietetics	Jaypee Brothers Medical Publishers	2021 & 2 nd edition

Reference Books

S. No	Authors	Title	Publishers	Year and Edition
1.	Peter J. R. Smith, Anne M. O'Connor	Essentials of Nutrition Science	Wiley-Blackwell	2021 & 3 rd edition
2.	Jeffrey S. Volek, Richard D. Feinman	Nutrition Science and the Science of Nutrition	Elsevier	2022 & 4 th edition
3.	Deborah P. McHugh, Thomas M. Saunders	Fundamentals of Human Nutrition Science	McGraw-Hill Education	2023 & 1 st edition

Blended learning links

S. No.	Topics	Links
1.	Malnutrition	https://www.youtube.com/watch?v=jEd91r__5Y
2.	Proteins	https://www.youtube.com/watch?v=HSCUAjZQhXI
3.	Basal Metabolic Rate (BMR)	https://www.youtube.com/watch?v=zeZn2p-40QE
4.	Fat- Soluble Vitamins	https://www.youtube.com/watch?v=ZLGMCYeeRgM
5.	Mineral: Iodine, Zinc, Fluoride, Selenium	https://www.youtube.com/watch?v=cWwpt3uI5d4

Pedagogy

The course will be delivered using a combination of traditional and learner-centered teaching methods, including:

- Lecture – Chalk and Talk
- PowerPoint presentations
- E-content and digital learning resources
- Case study discussions related to nutrition and health
- Meal planning exercises and diet analysis
- Group discussions
- Assignments
- Quizzes
- Peer learning activities
- Student seminars

Course Designers & Teaching–Learning Strategies

Course Code & Title	BF26A01 & Principles of Food and Nutrition
Course Designer	Dr. N. Deepa Sathish, Ms. Priyanga M

Course Code	Course Title	Hours			Credits
		Total	Practical	Examination	
BF26AP1	Generic Elective Practical I : Nutrition and Health Assessment Practical	90	87	3	3

Preamble

- Introduces students to the fundamental principles of nutritional analysis through practical laboratory experiments
- Focuses on qualitative and quantitative estimation of major nutrients such as carbohydrates, proteins, fats, minerals, and vitamins
- Provides hands-on experience in biochemical tests and analytical techniques used for identification of food constituents
- Enhances understanding of reaction mechanisms involved in nutrient analysis and their applications in food systems
- Develops laboratory skills, accuracy, and precision in handling instruments and conducting experiments
- Promotes analytical thinking and interpretation of experimental results for evaluating nutritional quality of foods
- Prepares students for applications in food quality control, nutrition analysis, and research in food industries

Prerequisite

Basic knowledge of food groups, nutrients, and fundamental concepts of human nutrition. Familiarity with simple calculations and laboratory techniques is recommended.

Course Learning Outcomes (CLOs)

On the successful completion of the course, students will be able to,

CLO No	Course Learning Outcome	Bloom's Level
CLO1	List the basic principles of qualitative and quantitative analysis of nutrients in foods	K1
CLO2	Explain the reactions involved in the identification of carbohydrates, proteins, and minerals	K2
CLO3	Perform qualitative and quantitative estimation of nutrients such as glucose, protein, iron, calcium, and vitamins	K3
CLO4	Analyze the results obtained from biochemical tests and interpret the presence of food constituents	K4
CLO5	Evaluate the nutritional composition of food samples based on laboratory findings	K5
CLO6	Design and demonstrate experiments for the analysis of nutritional components in food systems	K6

Experiment - wise –CLO Mapping

Exp. No.	Coverage	Mapped CLOs
1–2	Sugar analysis (qualitative & quantitative)	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
3–4	Protein and nitrogen estimation	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
5–6	Mineral analysis (qualitative & iron estimation)	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
7–8	Calcium and phosphorus estimation	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6
9–10	Vitamin C, fibre and fat estimation	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6

Alignment of CLO with PLO

3 = High, 2 = Medium, 1 = Low

CLO \ PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1	3	1	1	1	1	1	1	1	1	1	1	1
CLO2	3	2	2	1	1	1	1	1	1	1	2	1
CLO3	3	3	2	1	2	2	1	1	1	1	1	1
CLO4	2	2	3	2	1	1	2	1	1	1	1	1
CLO5	2	1	3	2	1	1	1	2	1	1	1	1
CLO6	2	3	2	2	2	2	1	2	1	2	2	1

Nutrition and Health Assessment Practical (BF26AP1)**Total Hours: 45**

1. Qualitative tests for sugars – Glucose, Fructose, Lactose, Maltose, Sucrose
2. Quantitative estimation of glucose
3. Qualitative tests for protein
4. Demonstration of estimation of nitrogen
5. Qualitative tests for minerals
6. Quantitative estimation of iron
7. Quantitative estimation of calcium
8. Quantitative estimation of phosphorus
9. Quantitative estimation of ascorbic acid
10. Demonstration of fibre and total fat estimation

Text Books

S. No	Authors	Title	Publishers	Year & Edition
1	S. Sadasivam & A. Manickam	Biochemical Methods	New Age International	2022 & 3rd Edition
2	N. Raghuramulu, K. Madhavan Nair & S. Kalyanasundaram	A Manual of Laboratory Techniques	National Institute of Nutrition (ICMR-NIN)	2023 & Edition
3	Pomeranz Y. & Meloan C.E.	Food Analysis: Theory and Practice	CBS Publishers	2020 & 4th Edition
4	V. K. Joshi	Food Analysis and Quality Control	IK International Publishing	2021 & 1st Edition
5	Suzanne Nielsen	Food Analysis	Springer	2024 & 6th Edition

Reference Books

S. No	Authors	Title	Publishers	Year & Edition
1	FSSAI (Ministry of Health & Family Welfare)	Manual of Methods for Analysis of Foods	Government of India	2024 & 2nd Edition
2	David T. Plummer	An Introduction to Practical Biochemistry	Tata McGraw Hill	2019 & 5th Edition
3	S. Ranganna	Handbook of Analysis and Quality Control for Fruit and Vegetable Products	Tata McGraw Hill	2022 & 2nd Edition

Online references

S. No	Topics Covered	Links
1	Qualitative and quantitative analysis of carbohydrates	https://www.youtube.com/watch?v=1XKxWIYl6nA
2	Protein analysis and nitrogen estimation (Kjeldahl method)	https://www.youtube.com/watch?v=zm-3kovWpNQ
3	Mineral estimation (iron, calcium, phosphorus)	https://www.youtube.com/watch?v=QhUrc4BnPgg
4	Vitamin C estimation and food analysis techniques	https://www.youtube.com/watch?v=9kD9gWwK0Vg
5	Fibre and fat estimation in foods	https://www.youtube.com/watch?v=QhUrc4BnPgg

Course code & Title	BF26AP1 & Nutrition and Health Assessment Practical
Course Designers	Dr. N. Deepa Sathish, Ms. Priyanga M

Course Code	Course Title	Hours			Credits
		Total	Lecture	Examination	
NME26ES	Introduction to Entrepreneurship	30	30	-	2

Preamble

- To introduce the basic concepts and importance of entrepreneurship in economic and social development.
- To familiarize students with entrepreneurial traits, types of entrepreneurs, and the process of starting small enterprises.
- To provide awareness about entrepreneurship development programmes, institutional support, and financial assistance available for entrepreneurs.

Prerequisite

- Basic awareness of business activities, economic environment, and interest in entrepreneurial initiatives.

Course Learning Outcomes (CLOs)

CLO No	Course Learning Outcome	Bloom's Level
CLO1	Define the fundamental concepts, characteristics, and types of entrepreneurship and entrepreneurs.	K1
CLO2	Explain the role of entrepreneurship development programmes, institutional support systems, and government incentives for entrepreneurs.	K2
CLO3	Apply creative thinking and innovation techniques to identify entrepreneurial opportunities and solve business problems.	K3
CLO4	Analyze the significance of intellectual property rights and institutional support in promoting entrepreneurial ventures.	K4
CLO5	Evaluate different project ideas and assess their feasibility using basic project appraisal concepts.	K5
CLO6	Develop a basic project report for a small entrepreneurial venture based on identified opportunities.	K6
K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create		

Unit –CLO Mapping

Unit	Coverage	Mapped CLOs
Unit 1	Introduction to Entrepreneurship, factors, barriers, entrepreneurial traits and types, steps for starting small industries, MSMEs, social entrepreneurship	CLO1, CLO2
Unit 2	Entrepreneurship Development Programmes, institutional framework (IFCI, ICICI, IDBI, IRBI, EXIM Bank, NSIC, SIDBI, SFC, SIPCOT, TIIC), incentives and subsidies	CLO1, CLO2, CLO3, CLO4
Unit 3	Innovation, types of innovation, creative problem solving, incubators, angel investors, venture capital	CLO1, CLO2 CLO3, CLO4
Unit 4	Intellectual Property Rights – copyright, patents, trademarks, design and registration procedures	CLO1, CLO2, CLO3, CLO4
Unit 5	Project identification and classification, project formulation, project appraisal, project report presentation	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6

Alignment of CLO with PLO

3 = High, 2 = Medium, 1 = Low

CLO \ PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1	1	1	1	2	1	1	1	1	1	1	1	1
CLO2	1	1	1	2	3	1	1	1	1	1	1	1
CLO3	1	1	1	1	3	2	1	1	1	1	1	1
CLO4	1	1	2	1	3	1	1	1	1	1	1	1
CLO5	1	1	3	1	2	1	1	1	1	1	1	1
CLO6	1	2	1	2	3	1	1	1	1	1	1	1

INTRODUCTION TO ENTREPRENEURSHIP - NME26ES (30 HRS)

Unit 1 (6hrs)

Entrepreneurship-Introduction-Factors-Barriers-Entrepreneurial Traits and Types- Steps for starting a Small Industry- MSMEs – Social entrepreneurship.

Unit 2 (6hrs)

Entrepreneurship Development Programmes-Institutional Framework (IFCI, ICICI, IDBI, IRBI, EXIM Bank, NSIC, SIDBI, SFC, SIPCOT AND TIIC) - Role of Incentives and Subsidies

Unit 3 (6hrs)

Innovation - Types –Role- Creative Problem Solving -Incubators - Angel Investors - Venture Capital.

Unit 4 (6hrs)

Intellectual Property- Meaning- Copy Right Registration- Patents- Trademark- Design and Procedure for registration.

Unit 5 (6hrs)

Project Preparation

Project identification and Classification - Project Formulation- Project Appraisal- Project Report Presentation.

Text Books

Sl. No.	Author(s)	Title	Publisher	Year & Edition
1.	Gupta. C.B and Srinivasan.N. P	Entrepreneurial Development	Sultan Chand and Sons	2020 & 2 nd edition
2	Sauhari Vinnie and Bhushan Sudhashu	Innovation Management	Oxford	2014 & 1 st edition

Reference Books

Sl. No.	Author(s)	Title	Publisher	Year & Edition
1.	KolbBonitaM	Entrepreneurship for the creative and cultural industries	Routedge	2015& 1 st edition
2.	P.T.Vijayashree & M.Alagammai	Entrepreneurship and Small Business Management	Margham	2020& 1 st edition