॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड
'ज्ञानतीर्थ', विष्णुपुरी, नांदेड - ४३१ ६०६ (महाराष्ट्र राज्य) भारत
SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED
'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA
Established on 17th September, 1994, Recognized By the U.G.C. U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

Phone: (02462)215541 **Academic-1 (BOS) Section** website: srtmun.ac.in
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शैक्षणिक वर्ष २०२४–२५ पासून राष्ट्रीय शैक्षणिक धोरणानुसार लागू केलेल्या विज्ञान व तंत्रज्ञान विद्याशाखेतील पदवी प्रथम वर्षाच्या सुधारित (दुरूस्ती) अभ्यासक्रमा बाबत..

प रि प त्र क

संदर्भ:– १. जा.क्र.शै–१/एनईपी/विवत्रविपदवी/२०२४–२५/११२ दिनांक १२/०६/२०२४

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, संदर्भीय परिपत्रकान्वये दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या मा. विद्यापरिषदेच्या बैठकीतील विषय क्र. १५/५९–२०२४ अन्वये मान्यता दिल्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरणानुसार पदवी प्रथम वर्षाचे अभ्यासक्रम शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्यात आलेले आहेत. तथापी वरील संदर्भीय परिपत्रका अन्वये प्रकाशित केलेल्या अभ्यासक्रमामध्ये अभ्यासमंडळांनी किरकोळ दुरूस्ती करून अभ्यासक्रम सादर केला असून मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा यांच्या मान्यतेने दुरूस्ती केलेले खालील अभ्यासक्रम लागू करण्यात येत आहेत.

01	B. Sc. I year Food Science

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

डॉ. सरिता लोसरवार
सहाय्यक.कुलसचिव
शैक्षणिक अभ्यासमंडळ विभाग

'ज्ञानतीर्थ' परिसर,

विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शैक्षणिक–१/परिपत्रक/एनईपीपीजीदुरूस्ती/S&T/
२०२४–२५/ 279
दिनांक : २७.०९.२०२४
28

प्रत माहिती व पुढील कार्यवाहीस्तव.
०१. मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
०२. मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
०३. मा. संचालक, सर्व संबधित संकुले, प्रस्तुत विद्यापीठ.
०४. मा. प्राचार्य, सर्व संबधित महाविद्यालये, प्रस्तुत विद्यापीठ.
०५.सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदरील परिपत्रक विद्यापीठाच्या संकेतस्थळावर प्रसिध्द करण्यात यावे.

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED - 431 606 (MS)

(Credit Framework and Structure of Four Year UG Program with Multiple Entry and Exit Option as per NEP-2020)

UNDERGRADUATE PROGRAMME OF

SCIENCE & TECHNOLOGY

B.Sc. Food Science

Single Major

Affiliated College

Under the Faculty of Science & Technology

(Revised as per the Govt. Of Maharashtra circular dt. 13th March 2024)

B. Sc. First Year Semester I *(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Major Core1	SFSCCT-1101	Principles of Food Processing and Preservation	02	--	**04**	02	--
	SFSCCP-1101	Lab. Course in Principles of Food Processing and Preservation.	-	02			04
Major Core2	SFSCCT-1102	Food Biochemistry	02	--	**04**	02	--
	SFSCCP-1102	Lab. Course in Food Biochemistry	-	02			04
Major Core 3	SFSCCT-1103	Food Microbiology	02	--	**04**	02	--
	SFSCCP-1103	Lab. Course in Food Microbiology	-	02			04
Generic Elective *(from other Faculty)*	SFSCGE-1101	Marketing management & International trade **(Basket 3)**	02	--	**02**	02	--
Skill Based Course (related to Major)	SFSCSC-1101	Dairy Technology	--	02	**02**	--	04
Ability Enhancement Course (ENG)	AECENG-1101	L1 – Compulsory English	02	--	**02**	02	--
Ability Enhancement Course (MIL)	AECHIN-1101	L-2-Second Language Marathi(MAR), Hindi (HIN), Urdu (URD), Kannada (KAN), Pali (PAL), (Basket-4)	02		**02**	02	
Indian Knowledge System (IKS)	IKSXXX-1101	Indian Knowledge System **Basket 5**	02	--	**02**	02	--
Total Credits			**14**	**08**	**22**	**14**	**16**

B. Sc. First Year Semester I *(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

Subject	Course Code	Course Name	Theory				Practical		Total Col (6+7) / Col (8+9)
			Continuous Assessment (CA)			ESA			
			Test I	Test II	Average of T1 & T2/2	Total	CA	ESA	
Major Core1	SFSCCT-1101	Principles of Food Processing and Preservation	10	10	10	40	--	--	50
	SFSCCP-1101	Lab. Course in Principles of Food Processing and Preservation.	--	--	--	--	20	30	50
Major Core2	SFSCCT-1102	Food Biochemistry	10	10	10	40	--	--	50
	SFSCCP-1102	Lab. Course in Food Biochemistry	--	--	--	--	20	30	50
Major Core 3	SFSCCT-1103	Food Microbiology	10	10	10	40	--	--	50
	SFSCCP-1103	Lab. Course in Food Microbiology	--	--	--	--	20	30	50
Generic Elective *(from other Faculty)*	SFSCGE-1101	Marketing management & International trade **(Basket 3)**	10	10	10	40	--	--	50
Skill Based Course (related to Major)	SFSCSC-1101	Dairy Technology	--	--	--	--	20	30	50
Ability Enhancement Course (ENG)	AECENG-1101	L1 – Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course (MIL)	AECHIN-1101	L-2-Second Language Marath(MAR), Hindi(HIN), Urdu(URD), Kannada(KAN), Pali(PAL) , (Basket-4)	10	10	10	40	--	--	50

Indian Knowledge System (IKS)	IKSXXX-1101	Indian Knowledge System **Basket 5**	--	--	--	--	20	30	50

B. Sc. First Year Semester II*(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	CreditsAssigned			TeachingScheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Major Core1	SFSCCT-1151	Cereal Processing	02	--	**04**	02	--
	SFSCCP-1151	Lab. Course in Cereal Processing	-	02			04
Major Core2	SFSCCT-1152	Food Packaging	02	--	**04**	02	--
	SFSCCP-1152	Lab. Course in Food Packaging	-	02			04
Major Core3	SFSCCT-1153	Legumes & oil Seed Technology	02	--	**04**	02	--
	SFSCCP-1153	Lab. Course in Legumes & oil Seed Technology	-	02			04
Generic Electives *(from other Faculty)*	SFSCGE-1151	Food Science and Nutrition **(Basket 3)**	02	--	**02**	02	--
Skill Based Course (related to Major)	SFSCSC-1151	Wheat Milling & Baking Technology	--	02	**02**	--	04
Ability EnhancementCourse (ENG)	AECENG-1151	**L1 – Compulsory English**	02	--	**02**	02	--
Ability EnhancementCourse (MIL)	AECHIN-1151	L-2-Second Language Marathi(MAR), Hindi(HIN), Urdu(URD), Kannada(KAN), Pali(PAL), (Basket-4)	02	--	**02**	02	--
Value Education Course (VEC)	VECCOI-1151	Constitution of India	02	--	**02**	02	--

Total Credits	**14**	**08**	**22**	**14**	**16**

B. Sc. First Year Semester II*(Level 4.5)*

Examination Scheme

[20% Continuous Assessment (***CA***) and 80% End Semester Assessment (***ESA***)]

Subject	Course Code	Course Name	Theory				Practical		Total Col (6+7) / Col (8+9)
			Continuous Assessment (CA)			ESA			
			Test I	Test II	Average of T1 & T2	Total	CA	ESA	
Major Core1	SFSCCT-1151	Cereal Processing	10	10	10	40	--	--	50
	SFSCCP-1151	Lab. Course in Cereal Processing	--	--	--	--	20	30	50
Major Core2	SFSCCT-1152	Food Packaging	10	10	10	40	--	--	50
	SFSCCP-1152	Lab. Course in Food Packaging	--	--	--	--	20	30	50
Major Core 3	SFSCCT-1153	Legumes & Oil Seed Technology	10	10	10	40	--	--	50
	SFSCCP-1153	Lab. Course in Legumes & oil Seed Technology	--	--	--	--	20	30	50
Generic Electives *(from other Faculty)*	SFSCGE-1151	Food Science and Nutrition **(Basket 3)**	10	10	10	40	--	--	50
Skill Based Course (related to Major)	SFSCSC-1151	Wheat Milling & Baking Technology	--	--	--	--	20	30	50
Ability EnhancementCourse (ENG)	AECENG-1151	**L1 – Compulsory English**	10	10	10	40	--	--	50
Ability EnhancementCourse (MIL)	AECHIN-1151	L-2-Second Language Marathi(MAR), Hindi (HIN),	10	10	10	40	--	--	50

		Urdu (URD), Kannada (KAN), Pali (PAL), (Basket-4)							
Value Education Course (VEC)	VECCOI-1151	Constitution of India	10	10	10	40	--	--	50

Course Structure: *Major 1 -Teaching Scheme*

SFSCCT-1101: ***Principles of Food Processing and Preservation***

(Major 1) Curriculum Details

CourseCode	CourseName (Paper Title)	TeachingScheme(Hrs.)		CreditsAssigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1101	Principles of food processing and preservation	32	48	02	02	04

Major 1 -Assessment Scheme

Course Code (2)	Course Name (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCCT-1101	Principles of food processing and preservation	10	10	10	40	20	30	100

Course Pre-requisite:

1. Basic knowledge of food and food preservatives is required to learn this subject.

Course Objectives:

1. To understand the types of foods and their sources.
2. To provide knowledge about methods of food preservation
3. To introduce students to new developments in the field of food processing.

Course Outcomes:

- Will prepare students to understand various methods of food preservations& processing.
- It will also help students to learn the application in industries.

Curriculum Details:*(There shall be FOUR Modules in each course)*

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to food preservation:** .	**8 hrs**
	1.1	Principle and importance of preservation.	
	1.2	Food spoilage, classify food on the basis of spoilage	
	1.3	Define spoilage and causes of spoilage	
	1.4	Preservation methods with emphasis on inactivation, inhibition, and avoiding recontamination	
2.0		**Drying and fermentation**	**8 hrs**
	2.1	Drying curve and drying time calculation.	
	2.2	Water activity and moisture absorption isotherms, Psychometric chart	
	2.3	Different types of dryers Conductive, convective, and combined, IMF foods; osmotic dehydration	
	2.4	Preservation by fermentation	
3.0		**Temperature**	**8 hrs**
	3.1	High temperature- Sterilization and Pasteurization, , Thermal death time,Dvalue,F value value	
	3.2	canning, aseptic packaging	
	3.3	Low temperature:Chilling and Freezing; Freezing curve and water activity; Properties of frozen foods	
	3.4	Enthalpy change during freezing; Plank's equation for freezing time; Cold storage andRefrigeration load, types of freezing	
4.0		**Recent techniques in processing**	**8 hrs**
	4.1	Newer techniques in thermal processing:HTST, UHT; Ohmic, Dielectric, Infra-red Heating; Microwave heating	
	4.2	Non-thermal processing of food: High-pressure processing, Pulsed electric field, Cold extrusion; Plasma processing; Ionizing radiation; Ultrasound processing; UV and Pulsed light processing; Membrane Technology	
	4.3	Magnetic technique	
	4.4	Hurdle technology	
		Total	**32 hrs**

TextBooks:

1. Technology of Food preservation N.W. Dersoir and N.W.Dersoir
2. Introduction to Food Science and Technology. G.P. Stewart and M.A. Amerine

3. Advances in Thermal food preservation,2007, GauravTewari& Vijay K Juneja, Blackwell Publishing

ReferenceBooks:

1. William Frazier, Food Microbiology, Tata McGraw-Hill Publication.
2. P. Fellows, Food Processing Technology, second edition 2000, Woodhead Publishing limited & CRC Press...
3. Handbook of food preservation Edited by M.ShaffurRahman, 2007, CRC Press

Practicals

Sr.No.	Practicals
1	Study of machineries used in processing.
2	Demonstration of effect of blanching on quality of foods.
3	Study of preservation of foods by heat treatment canning-Canning of fruitsand vegetables.
4	Preservation of food by high concentration of sugar i.e., preparation of jam
5	Preservation of food by using salt-pickle.
6	Preservation of food by using chemicals
7	Preservation of bread, cake using mold-inhibitors.
8	Drying of Mango/other pulp

SFSCCT-1102:

Food Biochemistry

Course Code	Course Name (Paper Title)	Teaching Scheme(Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1102	Food Biochemistry	32	48	02	02	04

Major 1 -Assessment Scheme

Course Code	Course Name	Theory				Practical		Total
		CA			ESA			
		Test I	Test II	Avg of T1 & T2		CA	ESA	
SFSCT-1102	Food Biochemistry	10	10	10	40	20	30	100

SFSCCT-1102 Subject: Food Biochemistry

Course pre-requisite:

1. Basic knowledge of chemistry to learn from this subject

Course Objectives:

1) Understand the nature and scope of biochemistry.
2) Understand the cellular biochemistry.
3) Learn about nutrients and enzymes.
4) To outline the important aspects of food relating to nutrition

Course Outcomes:

- After successful completion of this course students will be able to understand cell structure, metabolism of carbohydrates, classification, structure and metabolic function of proteins, lipids and vitamins.
- Evaluate the biological functions of foods for health in addition to nutritional values

Curriculum Details:

SFSCCT-1102 Subject: Food Biochemistry

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Carbohydrates & lipids**	
	1.1	Carbohydrates:-Definition, Classification, structures and importance.	
	1.2	Carbohydrates Metabolism	
	1.3	Lipids: Definition, Classification, structures and importance.	
	1.4	Lipid Metabolism.	**8hrs**
2.0		**Proteins and water**	
	2.1	Protein: Defination, Classification, sources and importance.	
	2.2	Structure of peptides, peptide bond, protein structure primary, secondary, Tertiary and Quaternary structure of Protein	**8hrs**
	2.3	Amino Acids: Defination and Classification	
	2.4	Properties of water, weak acids & weak base, pH & Buffers	
3.0		**Enzymes**	
	3.1	Sources Nomeculture, classification: MichelisMenten equation	
	3.2	Mechanism in enzyme action	
	3.3	Enzyme Kinatics.	
	3.4	Molecular Biology and Biotechnology: Nucleic acid (DNA & RNA) Nucleotides & nucleosides, Replication of DNA (E. coli)	**8hrs**
4.0		**Vitamins and Minerals**	**8hrs**
	4.1	Vitamins: Definition, Sources, Classification and Importance	
	4.2	Minerals: Definition, Sources, Classification and Importance	

		Total	**32 hrs**

TextBooks:

1. .SunetraRoday. Food Science and Nutrition. Oxford Education/Oxford University Press, 2 nd Edition, 2012
2. AmbikaShanmugam. Fundamentals of Biochemistry for Medical Students. Nagaraj and Company Pvt Ltd. 7th Edition (reprinted), 2005.
3. Vasudevan DM and Sreekumari S. Textbook of Biochemistry. Jaypee Brothers Medical Publsihers Pvt Ltd. New Delhi, 3rd Edition, 2001.

ReferenceBooks:

1. Biology for Chemist by Agrawal&Agrawal.
2. Biochemistry by Albert L Lehninger.
3. Biochemistry by U Satyanarayana& U Chakrapani
4. Fundamentals of Biochemistry by J L Jain, Sunjay Jain &Nitin Jain.
5. Lehninger A L, Nelson D L and Cox M M (2009). Principles of Biochemistry, 6th Ed. CBS Publishers and Distributors.
6. Murray R.K, Granner D K, Mayes P A and Rodwell V W (2009). Harper's Biochemistry, 28th Ed, Lange Medical Book

Practicals

Sr.No.	Practicals
1.	Safety measures in the laboratory.
2.	Preparation of various solutions and buffers.
3.	Qualitative and quantitative estimation of carbohydrates.
4.	Study of swelling and solubility characteristics of starches.
5.	Determination of crude protein by micro kjeldhal method.
6.	Determination of Fat
7.	Determination of moisture content of foods using different methods
8.	Preparation of mineral solutions by using ash and tri acid methods (Dry andwet oxidations)
9.	Estimation of calcium.
10.	Determination of iron.

Course Structure:*Major 3 -Teaching Scheme*

SFSCCT- 1103 Subject : Food Microbiology

Course Code	Course Name (Paper Title)	Teaching Scheme(Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1103	Food microbiology	32	48	02	02	04

Major3 -Assessment Scheme

Course Code (2)	Course Name (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCCT-1103	Food microbiology	10	10	10	40	20	30	100

SFSCCT-1103: *Food microbiology (Major3) Curriculum Details*

Course pre-requisite:

1.Basic knowledge of food groups and microbiology is required to learn this subject.

Course Objectives:

1) To understand microbial spoilage of foods.
2) To study the microbiology of various food groups
3) To provide knowledge about role of micro-organisms in food preservation

Course Outcomes:

After successful completion of this course students will be able to understand role of microbiology in food processing industry, microbiology of various food groups, food spoilage and food preservations

Curriculum Details:*(There shall be FOUR Modules in each course)*

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Basic of Microbiology**	**8hrs**
	1.1	Introduction to Microbiology; Brief history of Microbiology, contribution of A.V Leeuwenhoek, Louis Pasteur, Robert Koch and Edward Jenner in development of microbiology	
	1.2	Structure of prokaryotic and eukaryotic cell, major classes of Microorganisms.	
	1.3	Nutrient transport phenomenon and physiology of microorganisms.	
	1.4	Methods of isolation of pure Culture- pour plate, spread plate and streak plate methods,	
2.0		**Food borne diseases and food poisoning**	**8hrs**
	2.1	Introduction to food borne diseases, classification of food borne diseases- food born infection and Intoxication	
	2.2	Food born infection- bacterial, fungal and viral, Gram positive and Gram Negative food borne pathogens- Salmonella, Coliform, Shigella, V.cholerae, Staphylococcus, Clostridium botulinum, L.monocytogenes, fungal and viral food born infection	
	2.3	Food born intoxication- Biological and Non Biological, Microbial intoxication (Bacterial and fungal)	
	2.4	Non microbial (plant and Animal) and nonbiological (heavy Metals and metal ions)	
3.0		**Microbiological analysis of food.**	**8hrs**
	3.1	Detection and Enumeration of microbes in food, Indicator Microorganisms and Microbiological criteria	
	3.2	detection method for Bacteria- E.coli, Staphylococcus, Yersinia, Campylobacter, Bacillus, Clostridium.	
	3.3	Detection method for Viruses- Rotavirus,	
	3.4	Hepatitis A and E virus and polio virus.	
4.0		**Microbiology of different products**	**8hrs**
	4.1	Microbiology of milk and milk products	
	4.2	Microbiology of fruits and vegetables, Sources of contamination, spoilage and prevention	
	4.3	Microbiology of cereals and cereal products. Sources of contamination, spoilage and prevention	
	4.4	Microbiology of meat, poultry eggs, fish, sea foods.	

TextBooks:

1. Food microbiology by W.C Frazier and D.C. Westoff, Tata McGraw Hill Publication.
2. Microbiology by M.J Pelczar Jr.,ECS Chan and N.R. Krieg , TMH book company.
3. Modern food microbiology by G.J Banwart , AVI publication.
4. Food microbiology by M.R Adams.
5. Food born bacterial pathogens by Doyle M.P.

ReferenceBooks:

1. Modern food microbiology. James M.Jay
2. Basic food microbiology G.J.Banwart
3. Applied Microbiology-Singh B.D., Nallariu P., Kavikishore P.B. and Singh R.P.
4. Food microbiology and Labpractice-Bell
5. Fundamental Food Microbiology by Bibek Ray and ArunBhunia.
6. Food Microbiology: Fundamentals and Frontiers by Michael P. Doyle, Francisco DiezGonzalez, Colin Hill
7. Compendium of Methods for the Microbiological Examination of Foods by Ed. Salfinger, Yvonne

Practicals

Sr. No.	Practicals
1	Study of isolation of molds from foods.
2	Study of compound and electron microscope.
3	Study of microbial examination of Vegetables and fruits. Identification, isolation and confirmation of *R. nigricans/Erwiniacarotovora.*
4	Microbial examination of fish and other sea foods. Identification, isolation and confirmation of *Proteus.*
5	Study of microbial examination of eggs and poultry identification, isolation and confirmation of *Pseudomonas fluorescens.*
6	Study of gram staining of sample.
7	Study of detection of salmonella.
8	Study of thermal death time determination.

Course Structure: *-Teaching Scheme SFSCGE-1101*

Subject : Marketing Management and International Trade

Course Code	Course Name (Paper Title)	Teaching Scheme(Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCGE-1101	Marketing Management and International Trade	32	48	02	02	04

Assessment Scheme

Course Code (2)	Course Name (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCGE-1101	Marketing Management and International Trade	10	10	10	40	20	30	100

SFSCGE-1101: Marketing Management and International Trade

Course pre-requisite:

Basic knowledge of management in food industry

Learning Objectives:-

1. To impart comprehensive overview of the Marketing management.
2. To provide knowledge of marketing management and international trade.

Out-come:-

Will prepare students to understand need of marketing management and international trade

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to Marketing Management**	**8hrs**
	1.1	Marketing: Concept, functions, scope and marketing management; Process.	
	1.2	Concepts of marketing-mix, elements of marketing-mix.	
	1.3	Market structure and consumer buying behaviour	
	1.4	micro- and macro-environments.	
2.0		**Importance of marketing**	**8hrs**
	2.1	Marketing research and marketing information systems.	
	2.2	Market measurement, market forecasting, market segmentation, targeting and positioning.	
	2.3	Allocation and marketing resources.	
	2.4	Marketing planning process.	
3.0		**Marketing policies**	**8hrs**
	3.1	Product policy and planning: Product-mix, product line, product life cycle;	
	3.2	New product development process; Product brand, packaging, services decisions	
	3.3	Advertising: Objectives, budget and advertising message, media planning, personal selling, publicity, sales promotion.	
	3.4	Promotion-mix decisions	
4.0		**Scope of Marketing**	**8hrs**
	4.1	Marketing channel decisions; Retailing, wholesaling and distribution; Pricing decisions;	
	4.2	Price determination and pricing policy of milk products in organized and unorganized sectors of dairy industry.	
	4.3	World consumption of food: Patterns and types of food consumption	
		Total	**32hrs**

Reference Books

1. Marketing Management: A South Asian Perspecive, Philip Kotler. Killer, Koshy and Jha.
2. Fundamentals of Marketing: Willum J. Statnon.

Course Structure: *-Teaching Scheme*

SFSCSC-1101 Subject: Dairy Technology

Major 1 -Assessment Scheme

Course Code (2)	CourseName (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCSC-1101	Dairy technology	---	--	--	--	20	30	50

SFSCSC-1101: *Dairy technology Curriculum Details*

Coursepre-requisite:

1. Student should have the basic knowledge of cooking and dairy products are required to learn this subject

Course Objectives:

1. . To learn the manufacturing process of various dairy products

Course Outcomes:

- After successful completion of this course students will be able to understand production of various dairy products.

Practicals

Practical No.	Practicals
1.0	**Fermented milk products**
	Curd, Shrikhand, lassi& their types, paneer
2.0	**Chenna Based**
	Rasgulla, sandesh, Kalakand, Rasmalai
3.0	**Khoa Based**
	Gulabjamun, Peda. Various types of burfi
4.0	**Whole milk products**
	Rabri, Various kheers, milk shakes, Ice cream, kulfi

Course Structure: *Major 1 -Teaching Scheme*

SFSCCT-1151 Subject : Cereal Processing

Major 1 -Assessment Scheme

CourseCode	CourseName (Paper Title)	TeachingScheme(Hrs.)		CreditsAssigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1151	Cereal Processing	32	48	02	02	04

Course Code (2)	CourseName (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCCT-1151	Cereal Processing	10	10	10	40	20	30	100

SFSCCT-1151: *Cereal Processing (Major 1) Curriculum Details*

Course pre-requisite: Basic knowledge of chemistry, fruits and vegetable harvesting and processing to learn this subject.

Learning Objectives:-

1) Understand the post- harvest technology of fruits and vegetables
2) Understand the morphology structure and compositions of various fruits and vegetables..
3) Learn about harvesting importance of fruits and vegetables.
4) Understand ripening and storage practices of fruits
5) Learn about Handling and packaging of fruits and vegetables
6) Learn about Principles of transport and commercial transport operations

Out Comes:

After successful completion of this course students will be able to understand Post harvest technology of fruits and vegetables, Morphology, structures and composition of fruit and vegetable, Maturity standards, Fruits ripening, Storage practices, Physiological post- harvest diseases, chilling injury and diseases and Principles of transport and commercial transport operations.

Curriculum Details:*(There shall be FOUR Modules in each course)*

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		**Basic of Cereals**	
	1.1	Present status and future prospects of cereals (Rice, wheat, /corn, sorghum, Rye)	
	1.2	Morphology of Rice	
	1.3	Physical properties: Density bulk density, Angle of response hardness, asperity, porosity, stack of milling and moisture of physical properties.	**8hrs**
	1.4	Chemical composition- Distribution of nutrients and Aroma of rice. Drying of paddy- General principles and methods of drying, batch type, continuous type driers.	
2.0		**Cereal Processing**	
	2.1	Parboiling of rice: Milling of rice: Conventional milling, modern milling.	
	2.2	Advantages and disadvantages of milling machineries, By products of rice milling, aging of rice.	**8hrs**
	2.3	Enrichment-need of enrichment methods of enrichment, Enrichment levels of fortification of amino acids.	
	2.4	Processed foods from rice- breakfast cereals, flakes, puffing, canning and instance rice.	
3.0		**Cereal Morphology**	
	3.1	Corn morphology, Barley-morphology	
	3.2	Sorghum-morphology Physicochemical properties Milling, Malting, Pearling and industrial utilization	**8hrs**
	3.3	Physicochemical properties, corn milling fractions and preparations of modified starches.	
	3.4	physicochemical properties and processing (malting)	
4.0		**Importance of Cereals**	
	4.1	Millets-Oat/Rye- Importance of Millet	

	4.2	Composition, Processing of millets for food uses.	**8hrs**
		Total	**32hrs**

ReferenceBooks:

1. Technology of cereals:Kent
2. Post harvest technology of cereals, pulses and oil seeds: A.Chakrawarthy
3. Modern cereal science and technology: Y.Pomeranz
4. Utilization of rice:Luh
5. Post harvest biotechnology of cereals: D.K.Salunkhe
6. Handbook of cereal science and technology: O.R. Fennema, Markus,Karel

Practicals

Sr. No.	**Practicals**
1	Study of isolation of molds from foods.
2	Microbial examination of cereal and cereal products. Identification, isolation and confirmation of *R.nigricans.*
3	Study of microbial examination of Vegetables and fruits. Identification, isolation and confirmation of *R. nigricans/Erwiniacarotovora*.
4	Microbial examination of fish and other sea foods. Identification, isolation and confirmation of *Proteus.*
5	Study of microbial examination of eggs and poultry identification, isolation and confirmation of *Pseudomonas fluorescens.*
	Study of microbial examination of milk and milk products. Identification, isolation and confirmation of *S.thermophilus.*
7	Study of microbial examination of sugar, salt and spices. Identification, isolation and confirmation of *L. measenteroides/ L.dextranicum.*
8	Study of thermal death time determination.

SFSCCT-1152 Subject: Food Packaging

CourseCode	CourseName (Paper Title)	TeachingScheme(Hrs.)		CreditsAssigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1152	Food Packaging	32	48	02	02	04

Assessment Scheme

Course Code (2)	CourseName (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCCT-1152	Food Packaging	10	10	10	40	20	30	100

SFSCCT-1152: Food Packaging

Course pre-requisite

Basic knowledge of food processing industry arerequired to learn this subject.

Learning Objectives:-

1. To impart comprehensive overview of the scientific and technical aspects of food packaging
2. To provide knowledge of packaging machinery, systems, testing and regulations of packaging..

Out Comes:

Will prepare students to understand need of packaging, package functions, packaging materials, lamination coating, packaging of specific foods and mechanical and functional tests of package.

odule No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to packaging**	**8hrs**
	1.1	Introduction to subject, Packaging situations in world and India, need of packaging, plastic consumption/use in world, India etc. package requirements, package functions, hazards acting on package during transportation, storage and atmospheric package, labeling laws	
	1.2	Package materials: classification packages, paper as package material its manufacture, types, advantages, corrugated and paper board boxes etc.	
	1.3	Glass as package material, manufacture, advantages, disadvantages, metal as package material-manufacture,	
	1.4	Advantages, disadvantages, aluminum as package material,. Its advantages and disadvantages, plastic as package material.	
2.0		**Lamination, Coating and Aseptic packaging**	**8hrs**
	2.1	Lamination, need of lamination, types, properties, advantages & disadvantages of each type.	
	2.2	Coating on paper & films, types of coatings, need of coating, methods of coatings, Biodegradable and edible packaging, aseptic packaging-need, advantages, process, comparison of conventional & aseptic packaging.	
	2.3	System of aseptic packaging and materials used in aseptic packaging machineries used in packing foods.	
	2.4	Classification of polymers, properties, uses and chemistry of each plastic such as polyethylene.	
3.0		**Specific Packaging of foods**	**8hrs**
	3.1	polypropylene, polystyrene, polycarbonate, PVC, PVDC, cellulose acetate, nylon etc.	
	3.2	Packaging of specific foods with its properties like bread, biscuits coffee, milk powder, carbonated beverages snack foods etc.	
	3.3	Mechanical and functional tests on package	
	3.4	Various mechanical functional testes perform in laboratories on package boxes and package materials	
4.0		**Permeability of Product**	**8hrs**
	4.1	Permeability – theoretical consideration	

	4.2	permeability of gases and vapours, permeability of multilayer packages, permeability in relation to products.	
		Total	**32hrs**

REFERENCE BOOKS

1 Handbook of Package Engineering — Joseph F. Hanlon

2 Fundamentals of Packaging — F.A. Paine

3 Food Packaging — Sacharow and Griffin

4 Principles of Food Packaging — R. Heiss

5 Flexible Packaging of Foods — A.L. Brody

6 Food Packaging and Preservation — M. Mathouthi

Practicals

Sr. No.	**Unit Name**
1	Classification of various packages bared on material and rigidity
2	Measurement of thickness of paper, paper boards
3	Measurement of tensile strength of paper of paper boards
4	Determination of gas transmission rate of package films
5	Determination of WVTR of films
6	Determination of coating on package materials
7	Identification of plastic films prepackaging practices followed for packing fruits and vegetables

SFSCCT-1153 Subject: Legumes and oilseed Technology

Course Code	Course Name (Paper Title)	Teaching Scheme(Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1153	Legumes and Oilseed Technology	32	48	02	02	04

Assessment Scheme

Course Code (2)	CourseName (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCCT-1153	Legumes and Oilseed Technology	10	10	10	40	20	30	100

SFSCCT-1153: Legumes and Oilseed Technology

Course pre-requisite: Basic knowledge of legumes and oilseed processing industry are required to learn this subject.

Learning Objectives:-

1. To impart comprehensive overview of the scientific and technical aspects of legumes and oilseed.
2. To provide legumes processing knowledge.

Out Comes:

Will prepare students to understand processing of Legumes and oilseed technology.

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to Legumes and Oilseed**	**8hrs**
	1.1	Present status and future prospects of legumes and oilseeds; Morphology of legumes and oilseeds	
	1.2	Classification and types of legumes and oilseeds	
	1.3	Anti-nutritional compounds in legumes and oilseeds	
	1.4	Methods of removal of anti-nutritional compounds	
2.0			**8hrs**
	2.1	Milling of legumes: home scale, cottage scale and modern and	
	2.2	Milling methods, milling quality, efficiency	
	2.3	Factors affecting milling;	
	2.4	Problems in dhal milling industry	
3.0		**Processing of Legumes**	**8hrs**
	3.1	Soaking and germination of pulses	
	3.2	Cooking quality of legumes – factors affecting cooking quality	
	3.3	Oilseeds: composition, methods of extraction	
	3.4	Desolventization and refining of oils: degumming, neutralization bleaching, filtration, deodorization, etc.	
4.0		**By- Products of legumes and oilseeds**	**8hrs**
	4.1	New technologies in oilseed processing	
	4.2	Utilization of oil seed meals for food uses i.e. high protein products like concentrate, isolates	
	4.3	Byproduct of pulses and oil milling and their value addition.	
		Total	**32hrs**

Text book

Legumes Chemistry, Technology and Human Nutrition	Mathews RH
Post harvest technology of cereals: pulses and oilseeds	Chakraverty A.
Bailey's Industrial Oil & Fat Products.	Bailey A.E. and Shahidi
Food Legumes	Kay DE

Reference Book

Food and Feed from Legumes and Oilseeds	Smartt J and Nwokolo E.
Legumes and Oilseed Crops	Bajaj YPS

Practicals

Sr. No.	Unit Name
1.	Determination of physical properties of legumes/oilseeds
2.	Determination of antinutritional factors in legumes
3.	Cooking quality of dhal
4.	Puffing of legumes
5.	Preparation of composite legume flour
6.	Milling of legumes
7.	Preparation of soy milk and soy paneer
8.	Measurement of melting point of fats

SFSCGE-1151 *Food Science and Nutrition*

Course Code	Course Name (Paper Title)	Teaching Scheme(Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSGE-1151	Food Science and Nutrition	32	00	02	00	02

-Assessment Scheme

Course Code (2)	Course Name (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCGE-1151	Food Science and Nutrition	10	10	10	40	--	--	50

SFSCGE-1151: Food Science and Nutrition *Curriculum Details*

Course Pre-requisite:

1. Basic knowledge of management in food industry.

Course Objectives:

1. To impart comprehensive overview of the scientific and technical as food chemistry.
2. To provide knowledge of food science.

Course Outcomes:

- Will prepare students to understand need of foods science

Curriculum Details:*(There shall be FOUR Modules in each course)*

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to Food Science**	**8hrs**
	1.1	Definition and Scope of food science.	
	1.2	Function of food.	
	1.3	Concept of Nutrition	
	1.4	Food Groups	
2.0		**Balance diet and Evaluation of Food**	**8hrs**
	2.1	Definition and importance	
	2.2	Factors affecting balance diet (age, gender, physiological state)	
	2.3	Manu planning and its factors.	
	2.4	Introduction of evaluation of foods (Objective and Subjective).	
3.0		Food Adulterant	**8hrs**
	3.1	Definition of food Adulteration	
	3.2	Common Adultrantants present in food atoms	
	3.3	Method of detection of food adulterants in milk, sugar, tea, coffee powder, flour, turmeric etc.	
	3.4	Food Poisoning and Food infection, common intestinal deaseases.	
4.0		**Food Preservation**	**8hrs**
	4.1	General guidelines and rules for storage of all types of food stuffs.	
	4.2	Cross contamination, Food spoilage, Danger Zone	
	4.3	Importance, definition and uses of HACCP Importance of PFA Act and Limitations of PFA Act.	
	4.4	Definition and types of Food Additives.	
			32 hrs

Text Books:

Basic Food Scince in industry :production and application Aehle W Wiley- VCH Verlag GmbH & Co.

ReferenceBooks:

1. Principles of Food technology Khan M.Y. and Khan F. PHI Publications New Delhi 2015
2. Microbial Food technology in Ray R.C. and Rosell C.M. CRC Press,London 2017

SFSCSC-1151 Subject: Wheat Milling and Baking Technology- *Teaching Scheme*

CourseCode	CourseName (Paper Title)	TeachingScheme(Hrs.)		CreditsAssigned		
		Theory	Practical	Theory	Practical	Total
SFSCSC-1151	Wheat milling and baking technology	00	48	00	02	02

Assessment Scheme

Course Code (2)	CourseName (3)	Theory				Practical		Total [Col (6+7) or Col (8+9)] (10)
		CA			ESA (7)			
		Test I (4)	Test II (5)	Avg of T1 & T2 (6)		CA (8)	ESA (9)	
SFSCSC-1151	Wheat milling and baking technology	-	-	-	-	20	30	50

SFSCSC-1151 *Wheat milling and baking technology*

Course pre-requisite:

1. Basic knowledge of baking in food industry.

Course Objectives:

1. To learn about baking technology
2. To learn about bakery industry.

Course Outcome

Will prepare students to understand need f bakery industry community.

Curriculum Details: *(There shall be FOUR Modules in each course)*

UnitNo.	Topic
1.	Classification of Wheat based on physiochemical properties.
2.	Quality testing of flour and yeast.
3.	Preparation of Cake
4.	Preparation of Pastry
5.	Preparation of Pizza
6.	Preparation of bread
7.	Preparation of Cookies
8.	Preparation of Crackers and Biscuits