॥ 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 UGC U/s 2(f) and 12(B), NAAC Re-accredited with'B++' grade

Fax : (02462) 215572 | **Academic-1 (BOS) Section** | website: srtmun.ac.in

Phone: (02462)215542 | E-mail: bos@srtmun.ac.in

विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदवी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, दिनांक २७ मे २०२५ रोजी संपन्न झालेल्या मा. विद्यापरिषद बैठकीतील विषय क्रमांक १६/६१–२०२५ च्या ठरावानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील राष्ट्रीय शैक्षणिक धोरण–२०२० नुसारचे पदवी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यास मा. विद्यापरिषदेने मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील बी. एस्सी द्वितीय वर्षाचे खालील विषयाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यात येत आहेत.

01	B.Sc. Agriculture Microbiology	11	B.Sc. Physics
02	B.Sc. Botany	12	B.Sc. Seed Technology
03	B.Sc. Dairy Science	13	B.Sc. Horticulture
04	B.Sc. Electronics	14	B.Sc. Statistics
05	B.Sc. Environmental Science	15	B.Sc. Biochemistry
06	B.Sc. Fishery Science	16	B.Sc. Analytical Chemistry
07	B.Sc. Food Science	17	B.Sc. Agrochemical & Fertilizers
08	B.Sc. Geology	18	B.Sc. Industrial Chemistry
09	B.Sc./B.A. Mathematics	19	B.Sc. Industrial Microbiology
10	B.Sc. Microbiology		

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.

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शै–१/एनइपी/विवत्रंविपदवी/२०२५–२६/११६
दिनांक ०५.०६.२०२५

सहाय्यक कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत : माहितीस्तव तथा कार्यवाहीस्तव.
१) मा. कुलगुरू महोदयांचे कार्यलय, प्रस्तुत विद्यापीठ.
२) मा. प्र. कुलगुरू महोदयांचे कार्यलय, प्रस्तुत विद्यापीठ.
३) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
४) मा. संचालक, परीक्षा व मुंल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
५) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, परिपत्रक अभ्यासक्रम संकेतस्थळावर प्रसिध्द करण्यात यावेत.

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

Major in **DSC** and Minor in **DSM** (Subject)

Under the Faculty of Science & Technology

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

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED - 431 606

B. Sc. Second Year Semester III *(Level 4.5)*

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	SFSCCT-1201	Human Nutrition	02	--	**08**	02	--
	SFSCCT-1202	Fluid Mechanics	02	--			04
	SFSCCP-1201	Lab course in Human Nutrition	--	02		02	--
	SFSCCP-1202	Lab course in Fluid Mechanics	--	02			04
Optional 2	SFSCCT-1203	Heat and Mass Transfer	02	--	**04**	02	--
	SFSCCP-1203	Lab. Course in Heat and Mass Transfer	--	02			04
Generic Electives *(from other Faculty)*	SFSCGE-1201	Marketing Management **(Basket 3)**	02	--	**02**	02	--
Skill enhancement Course (related to Major)	SFSCSC-1201	Confectionary Technology	--	02	**02**	--	04
Ability EnhancementCourse (ENG)	AECENG-1201	L1 – Compulsory English	02	--	**02**	02	--
Ability EnhancementCourse	AECMIL1201	Hindi/Marathi/Urdu/Kanadi/Pali	02	--	**02**	02	--
Community Engagement Services (CES)	CCCXXX1201	Basket-6	--	02	**02**	--	04
Total Credits			**12**	**10**	**22**	**12**	**20**

B. Sc. Second Year Semester III *(Level 4.5)*

Examination Scheme

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

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	Course Code (2)	Course Name (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Continuous Assessment (CA)			ESA			
			Test I (4)	Test II (5)	Average of T1 & T2 (6)	Total (7)	CA (8)	ESA (9)	
Optional 1	SFSCCT-1201	Human Nutrition	10	10	10	40	--	--	50
	SFSCCT-1202	Fluid Mechanics	10	10	10	40	--	--	50
	SFSCCP-1201	Lab course in Human Nutrition	--	--	--	--	20	30	50
	SFSCCP-1202	Lab course in Fluid Mechanics	--	--	--	--	20	30	50
Optional 2	SFSCCT-1203	Heat and Mass Transfer	10	10	10	40	--	--	50
	SFSCCP-1203	Lab. Course in Heat and Mass Transfer	--	--	--	--	20	30	50
Generic Electives *(from other Faculty)*	SFSCGE-1201	**Marketing Management** **(Basket 3)**	10	10	10	40	--	--	50
Skill Based Course (related to Major)	SFSCSC-1201	Confectionary Technology		--	--	--	20	30	50
Ability EnhancementCourse (ENG)	AECENG-1201	L1 – Compulsory English	10	10	10	40	--	--	50
Ability EnhancementCourse	AECMIL1201	Hindi/Marathi/Urdu/Kanadi/Pali	10	10	10	40	--	--	50
Community Engagement Services (CES)	CCCXXX1201	Basket-6	--	--	--	--	20	30	50

B. Sc. Second Year Semester IV (Level 4.5)

Teaching Scheme

	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional 1	SFSCCT-1251	Food Additives	02	--	**08**	02	--
	SFSCCT-1252	Meat, Poultry and Fish Technology	02	--		02	--
	SFSCCP-1251	Lab course in Food Additives	--	02		--	04
	SFSCCP-1252	Lab course in Meat, Poultry and Fish Technology	--	02		--	04
Optional 2	SFSCCT-1253	Energy Generation and Conservation	02	--	**04**	02	--
	SFSCCP-1253	Lab. Course in Energy Generation and Conservation	--	02			04
Generic Electives *(from other Faculty)*	SFSCGE-1251	Food Laws	02	--	**02**	02	--
Skill enhancement Course (related to Major)	SFSCSC-1251	Fruits and Vegetable Processing	--	02	**02**	--	04
Ability EnhancementCourse (ENG)	AECENG-1251	L1 – Compulsory English	02	--	**02**	02	--
Ability EnhancementCourse	AECMIL1251	Hindi/Marathi/Urdu/Kanadi/Pali	02	--	**02**	02	--
VEC	VECEVS1251	Environmental Studies	02	--	**02**	02	--
Total Credits			**14**	**08**	**22**	**14**	**16**

B. Sc. Second Year Semester IV (Level 4.5)

Examination Scheme

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

(For illustration we have considered a paper of 02 credits, 50 marks, need to be modified depending on credits assigned to individual paper)

Subject (1)	Course Code (2)	Course Name (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
			Continuous Assessment (CA)			ESA			
			Test I (4)	Test II (5)	Average of T1 & T2 (6)	Total (7)	CA (8)	ESA (9)	
Optional 1	SFSCCT-1251	Food Additives	10	10	10	40	--	--	50
	SFSCCT-1252	Meat, Poultry and Fish Technology	10	10	10	40	--	--	50
	SFSCCP-1251	Lab course in Food Additives	--	--	--	--	20	30	50
	SFSCCP-1252	Lab course in Meat, Poultry and Fish Technology	--	--	--	--	20	30	50
Optional 2	SFSCCT-1253	Energy Generation and Conservation	10	10	10	40	--	--	50
	SFSCCP-1253	Lab. Course in Energy Generation and Conservation	--	--	--	--	20	30	50
Generic Electives *(from other Faculty)*	SFSCGE-1251	**Food Laws**	10	10	10	40	--	--	50
Skill enhancement Course (related to Major)	SFSCSC-1251	Fruits and Vegetable Processing	--	--	--	--	20	30	50
Ability EnhancementCourse (ENG)	AECENG-1251	L1 – Compulsory English	10	10	10	40	--	--	50
Ability Enhancement Course	AECMIL1251	Hindi/Marathi/Urdu/Kanadi/Pali	10	10	**10**	40	--	--	50
VEC	VECEVS1251	Environmental Studies	10	10	**10**	10	--	--	50

Course Structure: Major 1 -Teaching Scheme

SFSCCT-1201: Human Nutrition (Major 1)

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1201	Human Nutrition	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)	
SFSCCT-1201	Human Nutrition	10	10	10	40	20	30	100

Course Pre-requisite:

1. Basic knowledge of Human nutrition learn this subject.

Course Objectives:

1. To understand the relationship between food, nutrition and health.
2. To understand the functions of foods.
3. To learn about the various food groups and balanced diet.

Course Outcomes:

After successful completion of this course students will be able to understand food and nutrition, balance diet, RDA types of malnutrition, their causes and its preventive measures. Role of national and international agencies working in the field of nutrition.

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction to Nutrition**	**8 hrs**
	1.1	Food as a source of nutrients, Functions of foods, Definition of Nutrition and Nutrients.	
	1.2	Food Guide- Basic five food groups.	
	1.3	Assessment of nutritional status based on: Diet survey, Anthropometric measurement and clinical examination.	
	1.4	Food Fad and Faddism.	
2.0		**Concept and content of Nutrition**	**8 hrs**
	2.1	Nutritional Agencies	
	2.2	Community Nutrition	
	2.3	Nutritional policies	
	2.4	Metabolic function of Nutrients	
3.0		**Recommended Dietary Allowances**	**8 hrs**
	3.1	Balance diet, Classification of Balance diet.	
	3.2	Preparation of Balance diet for various age groups.	
	3.3	Athletic, Geriatric and sports person diet plan.	
	3.4	Water intake and losses.	
4.0		**Malnutrition**	**8 hrs**
	4.1	Types of Malnutrition.	
	4.2	Multi-factorial causes of malnutrition.	
	4.3	Nutrition infection and Immunity.	
	4.4	Nutrition Education.	
		Total	**32 hrs**

ReferenceBooks:

1. Community Nutrition Mc. Laren
2. Foods and Nutrition M.S. Swaminathan
3. Assessment of Nutritional status of Community D. B. Jelliffee

Practical's

Sr. No.	Practical's
1	Role of various national and international agencies in the field of human nutrition.
2	Study of Calculate BMI and body surface area.
3	Anthropometric measurement.
4	Preparation of balance diet for various age groups.
5	Biochemical analysis of Urine and blood.
6	Nutritional survey.
7	Preparation of weaning foods.
8	Project work with proper diet plan based on survey.

Course Structure: Major 1 -Teaching Scheme

SFSCCT-1202: Fluid Mechanics (Major 1)

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1202	Fluid Mechanics	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)	
SFSCCP- 1202	Fluid Mechanics	10	10	10	40	20	30	100

Course Pre-requisite:

1. Basic knowledge of fluid mechanics.

Course Objectives:

1. To understand fluid properties.
2. To understand measurement of pressure, Velocity and discharge.
3. To learn about the thermodynamics properties, capillarity, surface tension and vapor pressure.
4. Kinetics of fluids, dynamics of fluids and hydrostatic force on surfaces.

Course Outcomes:

After successful completion of this course students will be able to understand basic knowledge of fluid mechanics concepts related to fluids..

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Properties of Fluids**	**8 hrs**
	1.1	Introduction: fluid mechanics, Fluid statics, fluid dynamics.	
	1.2	Properties of fluids: Density, specific weight, specific volume, gravity.	
	1.3	Types of fluids.	
	1.4	Thermodynamics properties of fluids.	
2.0		**Pressure Measurements**	**8 hrs**
	2.1	Pressure and its measurements.	
	2.2	Pressure variation in a fluid at rest.	
	2.3	Measurement of pressure.	
	2.4	Vapor pressure and cavitation.	
3.0		**Hydrostatic force on surfaces**	**8 hrs**
	3.1	Hydrostatic source on surfaces: total pressure and Centre pressure.	
	3.2	Introduction of Buoyancy and its types.	
	3.3	Kinetic of fluid flow.	
	3.4	Dynamics of fluid flow.	
4.0		**Boundary layer flow**	**8 hrs**
	4.1	Introduction to boundary layer flow.	
	4.2	Drag force on flat plate due to boundary layer.	
	4.3	Separation of boundary layers.	
	4.4	Flow through pipes.	
		Total	**32 hrs**

ReferenceBooks:

1. Steeter U.L.., Fluidmechanics., Mc Graw-Hill Book Co., International Edition 1971.
2. King R. P., Introduction to practical fluid flow., Butterworth-Heinemman, 2002.
3. Y. Nakayama, Introduction to fluid Mechanics, Butterworth-Heinemman., 1998.

Practical's

Sr.No.	Practical's
1	Pressure measurement using U tube Manometer.
2	Demonstrate of Rota mater and Pilot tube.
3	Pascal's Law Verification.
4	Bernoli's Experimental.
5	Flow measurements using Venturi meter.
6	Flow measurements using orifice meter.
7	Major losses on pipe flow.
8	Raynolds number for a pipe flow.

Course Structure: Major 1 -Teaching Scheme

SFSCCT-1203: Heat and Mass Transfer (Major 1)

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1203	Heat and Mass Transfer	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)	
SFSCCT-1203	Heat and Mass Transfer	10	10	10	40	20	30	100

Course Pre-requisite:

1. Basic knowledge of heat and mass transfer.

Course Objectives:

1. To understand heat and mass transfer.
2. To understand the basic heat transfer process.
3. To learn about the theory of heat conduction Fourie's law.
4. Learn about convection, radiation and mass transfer.

Course Outcomes:

After successful completion of this course students will be able to understand basic knowledge of heat and mass transfer.

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Basics of Heat and Mass Transfer**	**8 hrs**
	1.1	Basic heat transfer process.	
	1.2	Thermal Conductivity.	
	1.3	Overall heat transfer co-efficient,	
	1.4	Physical properties related to heat transfer.	
2.0		**One dimensional study state conduction**	**8 hrs**
	2.1	Theory of heat conduction.	
	2.2	Fourier's law, Derivation of Fourier's equation in Cartesian coordinates.	
	2.3	Heat flow through slab.	
	2.4	Cylinder and sphere with non uniform thermal conductivity.	
3.0		**Convection**	**8 hrs**
	3.1	Forced and free convection.	
	3.2	Use of dimensional analysis for correlating variable affecting convection heat transfer.	
	3.3	Concept of Nossolt number.	
	3.4	Prandtl number, Reynolds number.	
4.0		**Radiation**	**8 hrs**
	4.1	Emissivity, absorptivity, transmissivity.	
	4.2	Radiation through black and grey surface.	
	4.3	Determination of shape factors.	
	4.4	Heat exchanger and Mass Transfer.	
		Total	**33 hrs**

Reference Books:

1. A cource in Haet and Mass transfer: S- Domkondwar (1993) Danpat Rai and Sons, New Delhi.
2. Heat transfer- C. P. Gupta (1964) Prentice Hall of India New Delhi.
3. Principles of Heat transfer- F. Kretiths and M.S.. Bohn. (1986) Harper and Row Publishers New York.

Practical's

Sr. No.	Practical's
1	To study different types of heat exchangers used in dairy and food industries.
2	Preparation and calibration of thermocouples.
3	Determination of thermal conductivity: milk, solids dairy food products.
4	Studies on heat transfer through extended surface.
5	Studies on temperature distribution and heat transfer in HTST pasteurizers.
6	Design problems on heat exchangers.

Course Structure: Generic Elective -Teaching Scheme

SFSCGE-1201- Marketing Management

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCGE-1201	Marketing Management	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-1201	Marketing Management	10	10	10	40	20	30	100

Course Pre-requisite:

Basic knowledge of marketing management.

Course Objectives:

1. To understand marketing management.
2. To understand concept of marketing and marketing mix with reference to products and service.
3. To learn about market segmentation and the product concept.

Course Outcomes:

After successful completion of this course students will be able to understand basic knowledge of marketing management.

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**The concept of marketing management**	**8 hrs**
	1.1	Introduction, definition of marketing.	
	1.2	Core concept of Marketing.	
	1.3	Over marketing concept.	
	1.4	P's of marketing.	
2.0		**Feature and Characteristics of services.**	**8 hrs**
	2.1	Intangibility, Inseparability.	
	2.2	Variability.	
	2.3	Perish ability.	
	2.4	Ownership.	
3.0		**Consumer behavior and factors affecting it.**	**8 hrs**
	3.1	Definition, process and factors affecting- culture, social, personal, psychological.	
	3.2	Market segment and product concept, Geographic and Demographic segment.	
	3.3	Psychographic and behavioral segment.	
	3.4	Product life cycle.	
4.0		**Promotion mix and marketing organization**	**8 hrs**
	4.1	Advertising.	
	4.2	Personal selling.	
	4.3	Sales promotion and publicity and public relation.	
	4.4	Duties and responsibilities at different level of market organization.	
		Total	**34 hrs**

Reference Books:

1. Market Management: Philip Kotler
2. Food service marketing-Francies Buttle

Course Structure: Skill Based -Teaching Scheme

SFSCSC-1201: Confectionary Technology

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCSC-1201	Confectionary Technology	00	48	00	30	50

Course Pre-requisite:

Basic knowledge of confectionary technology.

Course Objectives:

1 To understand the basic concept of technology related to food.

2 Understand the processing technology of confectionery product.

3. Learn about various confectionary technologies.

Course Outcomes:

After successful completion of this course students will be able to learn about various confectionary technologies.

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Preparation of Milk based products**	**8 hrs**
	1.1	Preparation of cham cham.	
	1.2	Preparation of Pudding	
	1.3	Preparation of faluda .	
	1.4	Preparation of milk cake .	
2.0		**Preparation of sugar based product.**	**8 hrs**
	2.1	Preparation of high boiled sweets.	
	2.2	Preparation of toffee, marshmallow	
	2.3	Preparation of candy and jelly	
	2.4	Preparation of Fondant, fudge	
3.0		**Preparation of flour based sweets and choclate.**	**8 hrs**
	3.1	Preparation of Bakery confectionery product	
	3.2	Preparation of Laddu, ghevar/Malpua..	
	3.3	Preparation of soanpapdi .	
	3.4	Preparation of chocolate.	
4.0		**Preparation of Fruits and vegetables confectionery product**	**8 hrs**
	4.1	Preparation of Halwa.	
	4.2	Preparation of Petha.	
	4.3	Preparation of fruit custard.	
	4.4	Preparation of Pie.	
		Total	**32 hrs**

Semester II

Course Structure: Major 1 -Teaching Scheme

SFSCCT-1251: Food Additives (Major 1)

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1251	Food Additives	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)	
SFSCCT-1251	Food Additives	10	10	10	40	20	30	100

Course Pre-requisite:

Basic knowledge of chemistry, food preservatives, food groups are required to learn this subject.

Course Objectives:

1. To impart knowledge of food additives.
2. To provide knowledge about food preservatives.
3. To provide knowledge of food colour and flavoring compounds used.

Course Outcomes:

Will prepare students to understand intentional and unintentional food additives, food preservatives, taste and flavor inducer, role of thickener's, stabilizers etc.

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Introduction of Food Additives**	**8 hrs**
	1.1	Intentional and unintentional food additives.	
	1.2	Toxicology and safety evaluation	
	1.3	Naturally occurring food additives.	
	1.4	food color (natural and artificial),	
2.0		**Importance of Food Additives**	**8 hrs**
	2.1	Importance and utilization of food color	
	2.2	Food preservatives and their chemical action	
	2.3	Food pigments,	
	2.4	Taste and flavor inducer, potentiate	
3.0		**Role of food Additives**	**8 hrs**
	3.1	Role and mode of action of salt, , ,	
	3.2	Role and mode of action of chelating agents.	
	3.3	Role and mode of action of stabilizers and thickeners.	
	3.4	Role and mode of action of polyhydric alcohol, anti-caking agent, firming and coloring agent.	
4.0		**Compounds of Food Additives**	**8 hrs**
	4.1	Anticaking agent.	
	4.2	Anti-oxidants.	
	4.3	Sweeteners.	
	4.4	Antimicrobial agents, spices, condiments.	
		Total	**32 hrs**

Reference Books:

1. Food chemistry Vol I — Fennama O. R.
2. Food chemistry — Mayer L. H

Practical's

Sr. No.	Practical's
1.	Study of evaluation GRAS aspects of food additives.
2.	Study of identification of food color by TLC.
3.	Study of isolation and identification of naturally occurring food pigment by paper and TLC.
4.	Study of spectrometric method of total chlorophyll (A & B).
5.	Study of determination of diacetyl content of butter.
6.	Study of role and mode of action of chelating agents in fruit juice.
7.	Study of role and mode of action of stabilizer and thickeners in frozen dairy products (ice cream).
8.	Study of role and mode of anti-oxidant in frozen fish.
9.	Study of role of leaving agent in baked food products.

Semester II

Course Structure: Major 1 -Teaching Scheme

SFSCCT-1252: Meat, Poultry and Fish Technology (Major 1)

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1252	Meat, Poultry and Fish Technology	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)	
SFSCCT-1252	Meat, Poultry and Fish Technology	10	10	10	40	20	30	100

Course Pre-requisite:

Basic knowledge of animal sources, chemistry and preservation process are required to understand this subject.

Course Objectives:

1 To study the structure and composition of various animal foods

2 To understand need and importance of livestock, egg, poultry and fish industry.

3 To study structure, composition and nutritional quality of animal products.

4 To understand technology behind preparation of various animal food products and byproduct utilization.

Course Outcomes:

After successful completion of this course students will be able to understand structure, composition slaughtering process grading of meat processing of meat poultry and fish.

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

ModuleNo.	UnitNo.	Topic	Hrs. Required to cover the contents
1.0		**Importance, development and composition of meat, poultry and fish**	**8 hrs**
	1.1	Sources and Physico-chemical properties	
	1.2	Muscle structure and Pre slaughter transport care	
	1.3	Anti- mortem inspection	
	1.4	Abattoir design and layout	
2.0		**Slaughtering of animals and poultry**.	**8 hrs**
	2.1	Postmortem inspection	
	2.2	Grading of meat	
	2.3	Factors affecting post mortem changes	
	2.4	Shelf life of meat	
3.0		**Processing, preservation of meat and Meat plant**	**8 hrs**
	3.1	Mechanical deboning	
	3.2	Aging or chilling	
	3.3	Freezing, Pickling curing, Cooking	
	3.4	Smoking of meat, Principles and methods of meat	
4.0		**Egg and Fish**	**8 hrs**
	4.1	Structure, Composition.	
	4.2	Quality characteristics, Processing Preservation of egg.	
	4.3	Fish types, Composition	
	4.4	Quality characteristics, Preservation of fish	
		Total	**33 hrs**

Reference Books:

- Principles of Meat science — F.J. Forrest
- Meat Technology — Gerard F
- Meat handbook — Albert Levie
- Developments in Meat Science Vol I & II — Ralston Lawrie
- Poultry production — R. A Singh

Practical's

Sr. No.	Practical's
1.	Pre slaughtering operations of meat animals and poultry birds
2.	Study of slaughtering and dressing of meat animals
3.	Study of post mortem changes in meat.
4.	Study of meat cutting and handling.
5.	Study of evaluation of meat quality
6.	Study of preservation of meat by different methods and preparation of meat and poultry products
7.	Evaluation of quality and grading of eggs 8 Study of preservation of shell eggs
8.	Subjective evaluation of Fresh Fish
9.	.Cut out examination of canned fish.(Sardine,Mackerel,Tuna)
10.	Fish product formulation/canning.
11.	Study of by- products utilization of meat, poultry and egg.

Course Structure: Major 1 -Teaching Scheme

SFSCCT-1253: Energy Generation and Conservation (Major 1)

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCCT-1253	Energy Generation and Conservation	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)	
SFSCCT-1253	Energy Generation and Conservation	10	10	10	40	20	30	100

Course Pre-requisite:

Basic knowledge of energy generation and conservation to understand this subject.

Course Objectives:

1 To understand the basic concept of units and dimension.

2 Understand the renewable energy sources and their equipment's and machines.

3. Learn about properties of fuel, steam and boilers..

Course Outcomes:

After successful completion of this course students will be able to understand ldeal glasses, the first laws of thermodynamics, Renewable energy sources, Fuels, Properties of steam and boiler mounting and boiler accessories..

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Units and dimension**	**8 hrs.**
	1.1	Basic concept of units and dimensions.	
	1.2	System, processes.	
	1.3	Cycles, energy.	
	1.4	The zeroth law of thermodynamics	
2.0		**Ideal gases**	**8 hrs.**
	2.1	Equation of state.	
	2.2	Compression and expansion of gases	
	2.3	The first law of thermodynamics.	
	2.4	Internal energy, enthalpy	
3.0		**Fuel and Steam**	**8 hrs.**
	3.1	Chemical properties, air for combustion, calorific value and its determination, Burners, firing of fuels.	
	3.2	Properties of steam: Wet, dry, saturated, superheated steam, use of steam tables	
	3.3	Boiler trial: Codes, Indian boiler regulation acts, Air stage, Air compressors	
	3.4	Condensers- Principle and types.	
4.0		**Steam generators and renewable energy**	**8 hrs.**
	4.1	Fire tube boilers, Water tube boilers.	
	4.2	Boiler mounting and boiler accessories.	
	4.3	Measurement of height of boiler chimney, Layout of pipeline and expansion joints	
	4.4	Renewable energy sources like solar, wind and biogas and their utilization in food processing.	
		Total	**34 Hrs.**

ReferenceBooks:

- Engineering thermodynamics – C.P. Gupta RajendraPrakash (1991) Nemi Chand and Sons Roorkee
- Elements of Heat engines- N.C. Pandya. C.S. Shah (1990) Charotar Publishing houseAnand.
- Indian boiler regulation codes (1991).

- Dairy Plant Engg. And management: Tufail Ahmed (196). Kitabmahal New Delhi.

Practical's

Sr. No.	Practical's
1.	Application of thermodynamics in engineering problems
2.	Determination of dryness fraction of steam
3.	To study the boiler installed in modern plant water softening, plant blackcock and steam line layouts and steam traps.
4.	Visit to sugar Mill or Rice Mill plant with steam utilization
5.	Study of solar water heater and biogas plants and appliances

Course Structure: Generic Elective -Teaching Scheme

SFSCGE-1251: Food Laws (Generic Elective)

Curriculum Details

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCGE-1251	Food Laws	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-1251	Food Laws	10	10	10	40	00	00	50

Course Pre-requisite:

Basic knowledge of food laws and to understand this subject.

Course Objectives:

1 To understand the basic concept of laws related to food.

2 Understand the Licenses, permits and Shop & establishment act.

3. Learn about PFA act

Course Outcomes:

After successful completion of this course students will be able to understand The consumer Protection Act, 1986, The payment of wages Act, 1936and Regulatory Agencies, PFA act and Licenses, permits and Shop & establishment act.

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Licenses, permits and Shop & establishment Act**	**8 hrs**
	1.1	Necessary to start and operate business of hotel catering.	
	1.2	Introduction &objectives of Act, registration of establishment.	
	1.3	Opening & closing hours of eating houses/ restaurants, residential hotels, Shops &commercial establishments, theatres or other places of public.	
	1.4	Penalty offences	
2.0		**PFA act**	**8 hrs**
	2.1	Introduction & objectives of Act.	
	2.2	Sale of certain admixture prohibited.	
	2.3	Duties &responsibilities of Food Inspector.	
	2.4	Procedure, sampling & analysis	
3.0		**The consumer Protection Act, 1986**	**8 hrs**
	3.1	Who is Consumer? Objectives of Consumer Protection Act.	
	3.2	Features of consumer protection Act, 1986	
	3.3	Remedies for deficiency in services.	
	3.4	The Eight (8) basic consumer Rights.	
4.0		**The payment of wages Act, 1936and Regulatory Agencies**	**8 hrs**
	4.1	Introduction & objectives of Act.	
	4.2	Responsibilities of payment of wages.	
	4.3	Fixation of wages period.	
	4.4	Deduction which may be made from wages, Penalty for	

		offence	
		Total	**32 hrs**

ReferenceBooks:

1. Bare Acts
2. Industrial laws, P. L. Malik
3. Industrial laws, J. K. Bareja
4. Industrial laws for managers, B. D. Singh
5. Industrial & labor laws, S. P. Jain

SFSCSC-1251: Fruits and Vegetable Processing

Course Code	Course Name (Paper Title)	Teaching Scheme (Hrs.)		Credits Assigned		
		Theory	Practical	Theory	Practical	Total
SFSCSC-1251	Fruits and Vegetable Processing	00	48	00	02	02

Curriculum Details

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)	
SFSCSC-1251	**Fruit and vegetable processing**	-	-	-	-	20	30	50

Course Pre-requisite:

Basic knowledge of food processing and to understand this subject.

Course Objectives:

1 To understand the basic concept of processing related to fruit.

2 Understand the types of foods and their sources.

3. Learn about methods of food preservation.

Course Outcomes:

After successful completion of this course students will be able to understand various methods of food preservation.

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

Module No.	Unit No.	Topic	Hrs. Required to cover the contents
1.0		**Pretreatment operations**	**8 hrs**
	1.1	Demonstration of blanching.	
	1.2	Demonstration on methods of drying.	
	1.3	Canning of fruits and vegetables	
	1.4	Demonstrate on Brine and Syrup	
2.0		**Extraction**	**8 hrs**
	2.1	Estimation of Moisture content and ash from fruit and vegetables	
	2.2	Demonstration on Extraction of vitamins and minerals	
	2.3	Extraction of fibers and fat	
	2.4	Demonstration on Extraction of starch and Pectin	
3.0		**Fruit processed product**	**8 hrs**
	3.1	Preparation of Jam, Jelly, marmalade	
	3.2	Preparation of RTS,Squash	
	3.3	Preparation of Fruit preserve and candy.	
	3.4	Preparation of fruit pulp,raisin,dried fig	
4.0		**Vegetable processed products**	**8 hrs**
	4.1	Preparation of Pickle, mixed pickle	
	4.2	Preparation of Potato wafers and banana wafers	
	4.3	Dried ginger, dehydrated vegetables, dried onion and garlic	
	4.4	Amchur powder	
		Total	**33 hrs**