Three-Year Undergraduate Program

Bachelor of Food Technology
BSc (Hons) Food Technology
2022-2023

Faculty of Applied Sciences

Parul University

Vadodara, Gujarat, India

1. Vision of the Department

To be an excellent department in educating and training students to become professional Food Technologist who is technically capable of working in Food Nutrition, Food Processing, Food Quality and Safety and Food Operation sectors.

2. Mission of the Department

M1	To upgrade the scientific knowledge in the areas of food science, food processing and safety for the development of food products through quality research.
M2	Develop knowledgeable critical thinkers who contribute to the food community through leadership, service and lifelong learning.
M3	To provide students with leadership quality and also to handle all the problems relating food industry.

3. Program Educational Objectives

The statements below indicate the career and professional achievements that the B.Sc. FoodTechnology curriculum enables graduates to attain.

PEO 1	Apply knowledge of food technology and understand the emerging techniques and advanced food Processing concepts.
PEO 2	Solve engineering problems related to the modern food sector/industry, and importance offood safety and hygiene processed food.
PEO 3	Identify opportunities in the domain of Food processing, quality assurance and quality control in private or government organizations and research laboratories to design or process food products as per the needs and specifications or can also emerge as an entrepreneur.
PEO 4	Signify the role of proteins /enzymes in foods and be able to control the major chemicaland biochemical (enzymatic) reactions.

4. Program Learning Outcomes

Program Learning outcomes are statements conveying the intent of a program of study.

PLO 1	**Knowledge**	Utilize foundational scientific principles to address intricate challenges through diverse solutions.
PLO 2	**Problem Analysis**	Evaluate and interpret experimental results, drawing conclusions based on acquired data, while also identifying, formulating, and analyzing scientific problems to arrive at solutions using diverse scientific principles.

PLO 3	**Designing Solutions**	Develop solutions and execute experiments that showcase theircomprehension of the methods and processes involved.
PLO 4	**Modern toolusage**	Create, select, and apply appropriate techniques, resources and ITtools in the analysis and synthesis of data within limitations.
PLO 5	**Communication Development**	Skilled at clear communication through both written and oral formats, capable of explaining complex concepts in understandable terms, learners will effectively engage with the scientific community and society on scientific matters.
PLO 6	**Employability**	Considering our learners' diverse career goals, including scientific, technical, and quantitative roles, the institution informs them about relevant job opportunities through the Placement cell, offering skill enhancement and value-added courses in addition to science subjects to give them a competitive advantage in the job market.
PLO 7	**Ethics**	Cultivate a sense of healthy competition among students while also nurturing a strong ethical foundation, including an appreciation for scientific principles and their impact on societal, economic, and environmental issues, understand and practice ethical values in both professional and personal spheres, contributing to a responsible society.
PLO 8	**Environment and Sustainability**	Understand the impact of scientific solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PLO 9	**Soft-Skill Development**	Develop soft skills like leadership, teamwork, and effective communication to excel in various roles and contribute to societal progress, enhancing academic, professional, and personal growth for self-improvement and collective advancement.
PLO 10	**Science and Society**	Apply logical thinking, knowledge, and skills in designing solutions for societal issues, including health, safety, and scientificresponsibilities.
PLO 11	**Life-long learning**	Encouraging learners to seek knowledge for personal or professional growth includes promoting volunteering, self-motivation, societal values, and lifelong learning for enhanced competitiveness and employability amidst technological advancements.
PLO 12	**Data Analysis and Interpretation**	Analyzing and interpreting scientific data, drawing meaningfulconclusions, and communicating results effectively.

5. Program Specific Learning Outcome:

PSO 1	**Recent research trends**	Design the solutions as per the recent industrial demandobjective.
PSO 2	**Software skill**	Test any apparatus and system with appropriate usage ofsoftware tools, and gather data for modelling system.

6. Credit Framework

Semester wise Credit distribution of the program			**Category wise Credit distribution of the program**	
			Category	**Credit**
Semester-1	22		Major Core	100
Semester-2	22		Minor Stream	-
Semester-3	22		Multidisciplinary	10
Semester-4	22		Ability Enhancement Course	4
Semester-5	22		Skill Enhancement Courses	4
Semester-6	22		Value added Courses	04
Total Credits:	**132**		Summer Internship	04
			Research Project/Dissertation	6
			Total Credits:	**132**

7. Program Curriculum

Semester 1						
Sr. No.	**Subject Code**	**Subject Name**	**Credit**	**Lect**	**Lab**	**Tut**
1	00019301AE01	Basic of English-I	2	2	0	0
2	00019301AE02	Basic Hindi-1	2	2	0	0
3	00019301AE03	Basic Gujarati-I	2	2	0	0
4	03010701UE01	Electronic Waste Management- Issues & Challenges	4	3	2	0
5	03010901UE01	Introduction to MATLAB Programming	4	3	2	0
6	05010101UE01	Office Automation	4	3	2	0
7	06010101UE05	First Aid and Life Support	4	4	0	0
8	16010101UE01	Fundamentals of Investment	4	4	0	0
9	16010101UE02	Digital Banking and Insurance	4	4	0	0
10	18010201UE01	Basic Photography	4	2	4	0
11	11011301DS01	Fruit and Vegetable Processing	2	2	0	0
12	11011301DS02	Lab-I Fruit and Vegetable Processing	2	0	3	0
13	11011301DS03	Food Chemistry-I	2	2	0	0
14	11011301DS04	Lab-II Food Chemistry-I	2	0	3	0
15	11011301DS05	Introduction to Food Technology-I	2	2	0	0
16	11011301DS06	Lab-III Introduction to Food Technology-I	2	0	3	0
17	11011301SE01	Sensory Evaluation	2	2	0	0
18	11011401VAC01	Climate Change & Sustainable Environment	2	2	0	0
19		AEC-1 (Compulsory Subjects: 1)	2	2	0	0
20		Elective-1 (Compulsory Subjects: 1)	4	2	4	0

21		Elective-1 (Compulsory Subjects: 1)	4	3	2	0
22		Elective-1 (Compulsory Subjects: 1)	4	3	2	0
23		Elective-1 (Compulsory Subjects: 1)	4	4	0	0
24		Elective-1 (Compulsory Subjects: 1)	4	4	0	0
Total			**38**	**28**	**17**	**0**
Semester 2						
Sr. No.	**Subject Code**	**Subject Name**	**Credit**	**Lect**	**Lab**	**Tut**
25	00019101SE01	Mathematical Aptitude	2	2	0	0
26	00019302VA01	IPDC Including History and Culture of India and IKS-I	2	2	0	0
27	11011302DS01	Food Chemistry-II	2	2	0	0
28	11011302DS02	Lab-I Food Chemsitry-II	2	0	3	0
29	11011302DS03	Introduction to Food Technology-II	2	2	0	0
30	11011302DS04	Lab-II Introduction to Food Technology-II	2	0	3	0
31	11011302DS05	Food Science	4	4	0	0
32	00019302AE05/ 00019302AE06	AEC Elective-II (Compulsory Subjects:1) (Basic Hindi-II, Basic Gujarati-II)	2	2	0	0
33	03010602UE01/ 19010202UE01	University Elective-II (Compulsory Subjects:1) (Maintenance of Household Apparatus/Public Health Nutrition)	4	3	2	0
34	15010402UE01/ 19010002UE01	University Elective-II (Compulsory Subjects:1) (Human Physiology/Digital Health)	4	4	0	0
Total			**26**	**21**	**8**	**0**
Semester 3						
Sr. No.	**Subject Code**	**Subject Name**	**Credit**	**Lect**	**Lab**	**Tut**
35	00019303AE01/ 00019303AE02/ 00019303AE03	Advanced English – I/ Basic German-I/Basic French-I	2	2	0	0
36	00019303VA01	VAC-3 (IPDC including history andculture of India and IKS - 2)	2	2	0	0
37	11011303SE01	Artificial Intelligence	2	2	0	0

38	17010103UE01/ 06010103UE02/ 05010103UE01/ 16010103UE01/ 21010103UE02	Intellectual Property / Cyber Security, Tools, Techniques and Counter Measures/Artificial Intelligence Application in People Management/ Income Tax Return& E-filling /Retail Management	4	4	0	0
39	11011303DS01	Wheat Milling and Baking Technology	2	2	0	0
40	11011303DS02	LAB-I Wheat Milling and BakingTechnology	2	0	4	0
41	11011303DS03	Food Processing Equipment	2	2	0	0
42	11011303DS04	LAB-II Food Processing Equipment	2	0	4	0
43	11011303DS05	Normal Nutrition	4	4	0	0
44		AEC-3 (Compulsory Subjects:1)	2	2	0	0
45		UE-3 (Compulsory Subjects:1)	4	4	0	0
46		UE-3 (Compulsory Subjects:1)	4	4	0	0
Total			**26**	**22**	**08**	**0**
Semester 4						
Sr. No.	**Subject Code**	**Subject Name**	**Credit**	**Lect**	**Lab**	**Tut**
47	00019304AE01/ 00019304AE02/ 00019304AE03	Advanced English – II/ Basic German-II/Basic French-II	2	2	0	0
48	11011304SE01	Food Industry Management	2	2	0	0
49	00019404VA01/ 00019404VA02/ 00019404VA03/	Foundations of Yoga/Physical Education & Sports/ National Cadet Corps (NCC)	2	2	0	0
50	15M10404VA01	Psychology of Stress, Health and Well being	2	2	0	0
51	11011304DS01	Post-Harvest Technology	4	4	0	0
52	11011304DS02	Spice and Flavor Technology	2	2	0	0
53	11011304DS03	LAB-I Spice and Flavor Technology	2	0	4	0
54	11011304DS04	Processing of Milk and Milk Products	2	2	0	0
55	11011304DS05	LAB-II Processing of Milk and MilkProducts	2	0	4	0
56	11011304DS06	Food Additives	4	4	0	0
57		BSC NEP AEC-4 (Compulsory Subjects: 1)	2	2	0	0
58		BSC NEP VAC-4 (Compulsory Subjects:1)	2	1	2	0
59		BSC NEP VAC-4 (Compulsory Subjects:1)	2	2	0	0
Total			**24**	**19**	**10**	**0**

Remark: Lab 2 credit = 3 hours for all semester

1. Detailed Syllabus

Semester 1

a. **Course Name: Fruit and Vegetable Processing**
b. **Course Code: 11011301DS01**
c. **Prerequisite:** Should be familiar with basic of Fruit and Vegetable Processing
d. **Rationale:** Acquire knowledge about the Fruit and Vegetable Processing
e. **Course Learning Objective:**

CLOBJ 1	Provide an overview of the structure, composition, and nutritional value ofvarious fruits and vegetables.
CLOBJ 2	Gain Knowledge of the growth of the Indian Food Processing industry.
CLOBJ 3	Understanding different food processes concepts.
CLOBJ 4	Provide insights into suitable packaging materials and methods for preservingprocessed fruits and vegetables..

f. **Course Learning Outcomes:**

CLO 1	Understanding of Basic Concepts to demonstrate a sound understanding of the basic concepts related to the structure, composition, and nutritional value of various fruits and vegetables.
CLO 2	Application of Processing Techniques to apply different processing techniques,including washing, sorting, peeling, cutting, blanching, drying, canning, freezing, and pickling, to a variety of fruits and vegetables.
CLO 3	Nutritional Preservation to identify and implement methods to preserve the nutritional content of fruits and vegetables during processing.
CLO 4	Value Addition Skills to develop value-added products from fruits and vegetables, such as jams, juices, sauces, and snacks, demonstrating creativity and innovation.

g. **Teaching & Examination Scheme:**

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	**Total**
2	**-**	**0**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Overview of F&V Processing.** Production and processing scenario of fruits and vegetables in India andWorld.	15	3
2	**Preservation of Fruits and Vegetables.** Overview of principles & methods of preservation of fruits and vegetables. Commercial processing technology of fruits and vegetables. Preservation of fruits and vegetables.	15	6
3	**Processed Products of F&V** Fruits based - RTS, Nectars, squash, canned pulp, toffee amchur, pickle, powder, bar, Papaya jam, candy. Pomegranate: juice, squash, syrup, anardana, dalimb manuka. Banana wafers, puree, powder, banana fig.	30	8
4	**Preparation of Guava, grapes, carrot-based products**Preparation of Guava; jelly, cheese, juice, canned guava, squash, toffee Grape: raisin, juice, wine, Fig: pulp, driedfig, toffee, powder, bar Carrot: preserve, candy, pickle, jam	20	8
5	**Unit 5. Processing of vegetables.** Dried cauliflower and cabbage, sauerkraut, pickle.Leafy vegetables; dried leafy vegetables, Spinach, Fenugreek, Coriander Leaves, Curry Leaves.	20	5
Total		**100 %**	**30**

i. Text Book and Reference Book:

1. Fruits and vegetable preservation principles and practice By R P Srivastava
2. Post-harvest Management and Processing of Fruits and Vegetables By Dr N SRathore
3. Preservation of Fruits and vegetable By Khader

LAB -1

a. Course Name: Lab-I Fruit and Vegetable Processing

b. Course Code: 11011301DS02

c. Prerequisite: Should be familiar with basic of Fruit and Vegetable Processing Rationale

d. Rationale: Acquire knowledge about the Fruit and Vegetable Processing

e. Course Learning Objective:

CLOBJ1	Stabilize farm prices and income: It stabilizes farm price by utilizing the excessproduce in value addition to provide additional income to the farmers.
CLOBJ2	Add variety to the diet: Value addition/processing make the food more attractiveand palatable
CLOBJ3	Learn foreign exchange through export of processed fruit and vegetable products.

f. Course Learning Outcomes:

CLO 1	Understand technical Skills in operating and handling common fruit and vegetableprocessing equipment and machinery used in the industry.
CLO 2	Application of Processing Techniques to apply various processing techniques, including washing, sorting, peeling, cutting, blanching, drying, canning, freezing,and pickling, to different fruits and vegetables.
CLO 3	Learn Preservation Methods effectively to maintain the nutritional content and overall quality of fruits and vegetables, understanding the principles behind each preservation technique.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		**Total**
L	**T**	**P**	**C**	**T**	**CE**	**P**	**T**	**P**	
-	**-**	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

List of Experiments:

Exp. No.	**Name of the Experiment**
1	Study of Hand-Refractometer & Preparation of Degree Brix (symbol °Bx) solution
2	Canning of mango/guava/papaya.
3	Preparation of fruit jam

4	Preparation of fruit jelly
5	Preparation of candy
6	Preparation of fruit leather
7	Dehydration of fruits and vegetables
8	Preparation of fruit RTS, fruit squash, cordial
9	Preparation of tomato ketchup
10	Preparation of pickle, mixed pickle
11	Preparation of potato chips

Text Book and Reference Book:

1. Fruits and vegetable preservation principles and practice By R P Srivastava
2. Preservation of Fruits and vegetable By Khader

(2)

a. **Course Name: Food Chemistry- I**
b. **Course Code: 11011301DS03**
c. **Prerequisite:** Should be familiar with basic of Food Chemistry
d. **Rationale:** Acquire knowledge about the Food Chemistry
e. **Course Learning Objective:**

CLOBJ1	Understanding various terminology regarding Food Chemistry.
CLOBJ2	Provide an understanding of the chemical function and properties of major foodcomponents.
CLOBJ3	Understanding of the chemical interactions of food components and their effectson sensory and nutritional quality, functional properties, and safety of foods
CLOBJ4	Understanding chemistry role in food processing

f. **Course Learning Outcomes:**

CLO 1	Recall the key principles of general chemistry as applied to food.
CLO 2	Apply chemical principles to analyse and interpret food reactions.

CLO 3	Explain the relationship between chemical composition and the functional properties of food.
CLO 4	Evaluate the impact of chemical additives on food preservation and safety.

g. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
2	-	0	2	20	20	-	60	-	100

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Introduction to Food Chemistry** Nature Scope And development of food chemistry. Role of food chemist.	8	3
2	**Water in Foods** Role and type of water in foods, Structure of water, Function of water, water activityand food spoilage, Water activity and sorption isotherm,Molecular mobility, and foods stability	12	4
3	**Dispersed systems of foods** 1. Physicochemical aspectsoffood dispersion system a) Sol b) Gel c) Foam d) Emulations 2. Rheology of diphase systems	15	5
4	**Carbohydrates** Introduction and classification of carbohydrates i. Functional characteristics of different carbohydrates (Sugar-water relationship and sweetness) ii. Maillard reactions, caramelization, methods to control non enzymatic reactions. iii. Modification of carbohydrates- unmodified and modified starches, Modified celluloses iv. Dietary fibres – NDF, ADF, cellulose, hemicelluloses, pectin, and carbohydrates digestibility –sugars and starch and their values v. Structure & Functional properties of polysaccharides, natural vegetable gums, carbohydrate composition of various natural foods.	20	6

5	**Proteins in foods** i. Introduction, classification & structureof protein ii. Protein content and composition in various foods- cereal grains, legumes and oilseed proteins, protein of meat, milk, egg and fish. iii. Functional properties of proteins in foods- water and oil binding, foaming and gelation, emulsification chilling, freezing, dehydration & radiations. iv. Unconventional sources of proteins- SCP, Fish proteinconcentrates, leaf proteins	25	7
6	**Lipids in Foods** i. Role and Use of lipid/fat: Occurrence, fat group classification. ii. Physico-chemical properties of lipids. iii. Chemical aspects of lipolysis, auto oxidation, antioxidants. iv. Technology offat and oil processing- a) Refining. b) Hydrogenation. c) Interesterification. d) Safety use of oils and fats in food formulation.	20	5
	Total	**100%**	**30**

Text Book and Reference Book:

1. Food chemistry By Fennama O.R.
2. Food chemistry By Mayer L.H.
3. Principles of food chemistry By John M. deMan, John W. Finley

LAB - 2

a. **Course Name: LAB -II Food Chemistry- I**
b. **Course Code: 11011301DS04**
c. **Prerequisite:** Should be familiar with basic of Food Chemistry
d. **Rationale:** Acquire knowledge about the Food Chemistry
e. **Course Learning Objective**

CLOBJ1	Distinguish how individual food components contribute to the overall quality offoods.
CLOBJ2	Understand the important chemical/biochemical reactions amongst various foodcomponents and how they influence food quality
CLOBJ3	Document, discuss, and scientifically provide inference on Food chemistry experiments.
CLOBJ4	Identify different laboratory results for micro nutrients and composition in foods.

f. Course Learning Outcomes:

CLO 1	Understand the principles of various laboratory techniques used in food chemistry.
CLO 2	Define and reproduce laboratory safety procedures.
CLO 3	Apply laboratory skills to conduct basic food chemistry experiments.
CLO 4	Evaluate the precision and accuracy of laboratory results.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
-	**-**	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

List of Experiments:

Exp. No.	**Name of the Experiment**
1	Determination of moisture content of foods
2	Isolation of egg and milk protein
3	Separation of amino acids by thin layer chromatography
4	Determination of saponification value and iodine number of fat/oil
5	Determination of crude protein by micro kjeldahl method
6	Determination of acid value
7	Estimation of calcium
8	Determination of iron

Text Book and Reference Book:

1. **Food chemistry** By Fennama O.R.
2. **Food chemistry** By Mayer L.H.
3. **Principles of food chemistry** By John M. deMan, John W. Finley,

(3)

a. **Course Name: Introduction to Food Technology - I**
b. **Course Code: 11011301DS061**
c. **Prerequisite:** Should be familiar with basic of Introduction to FoodTechnology
d. **Rationale:** Acquire knowledge about the Introduction to Food Technology
e. **Course Learning Objective**:

CLOBJ1	Describe the status of Indian Food Industry.
CLOBJ2	Understand the importance of nutrition, desirable & undesirable componentspresent in food, and Recommended Dietary Allowances (RDA)
CLOBJ3	Differentiate between Food Science and Technology
CLOBJ4	Determine the basic composition of foods experimentally
CLOBJ5	To study Importance of desirable & undesirable's constituents of food

f. **Course Learning Outcomes:**

CLO 1	Apply food technology principles to address real-world challenges in the foodindustry.
CLO 2	Recall key terminology and concepts related to food technology.
CLO 3	Understand the basic principles and processes of food technology.
CLO 4	Analyze the impact of food processing on the nutritional content and quality of food.
CLO 5	Apply food technology principles to address real-world challenges in the foodindustry.

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Introduction to Food Technology** Historical Development of Food Science and Technology. Evolution of Food Processing from prehistoric times till date. Introduction to various branches of Food Science andTechnology.	13	6
2	**Cereals and Millet** Introduction, structure, composition and uses and by-productsof cereals and coarse cereals. Wheat- Structure and composition of wheat, types (hard, soft/strong, weak). Rice- Structure & Composition of rice, parboiling of rice-Milling of rice. Millet – common millet, composition, nutritional benefits,introduction to processing of millet.	25	6
3	**Pulses** Introduction to pulses Chemical composition of pulses, processing of pulses-soaking, germination, decorations, cooking and fermentation. Toxic constituents in pulses and its detoxification processes	25	6
4	**Oil seeds and nuts** Introduction to oil seeds & nuts, Chemical composition, importance of oil seeds & nuts, Processing of oilseeds & nuts.	25	6
5	**Fruits and Vegetables** Classification of fruits and vegetables, general composition, enzymatic browning, names and sources of pigments, Dietary fibre. Post Harvest changes in fruits and vegetables – Climacteric rise, horticultural maturity, physiological maturity, physiological changes, physical changes, chemical changes, pathological changes during the storage of fruits and vegetables	12	6
	Total	**100%**	**30**

i. Text Book and Reference Book:

1. **Food: Facts and Principles** By by N. Shakuntala Manay (Author), M.Shadaksharaswamy (Author)
2. **Food science** By B. Srilakshmi Food Chemistry Meyer

LAB - 3

a. Course Name: LAB-III Introduction to Food Technology - I

b. Course Code: 11011301DS06

c. Prerequisite: Should be familiar with basic of Introduction to Food Technology

d. Rationale: Acquire knowledge about the Introduction to Food Technology

e. Course Learning Objective:

CLOBJ1	Ability to read and interpret drawings related to plant layout, process equipmentand components.
CLOBJ2	Ability to control the process and quality of the products commiserating with laid specifications.
CLOBJ3	Knowledge of testing and quality control activities.
CLOBJ4	Utilize equipment and history of food technology in practical.

f. Course Learning Outcomes:

CLO 1	Understand the role of microbes in fermentation, spoilage and food borne diseases.
CLO 2	Relate acquaint with fundamentals of food Processing.
CLO 3	Simplify develop skills for estimations of minerals in food.
CLO 4	Evaluate the suitability of different laboratory techniques for specific food processing challenges.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		**Total**
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	
0	**-**	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Text Book and Reference Book:

1. **Food: Facts and Principles** by N. Shakuntala Manay (Author), M. Shadaksharaswamy(Author)
2. **Food science** by B. Srilakshmi
3. **Food Chemistry** by Meye

List of experiments:

Exp. No.	Name of the Experiment
1	Orientation to working in a food analysis lab
2	Identification of different non-perishable commodities-cereals, millets, and their by-products
3	Study of different types of browning reactions
4	Study malting and germination of cereals and pulses
5	Study of fermentation and dextrinization
6	Study of post-harvest changes in fruits and vegetables (climacteric, non-climacteric)
7	Quality evaluation/inspection of different foods
8	Introduction to labelling of foods

(4)

a. Course Name: First Aid & Life Support

b. Course Code: 09010101UE01

c. Prerequisite: Basic computer literacy. Shall have the basic knowledge aboutanatomy and physiology of human body.

d. Rationale: Will gain basic knowledge about first aid & life sciences.

e. Course Learning Objective:

CLOBJ 1	Emergency scene assessment
CLOBJ 2	Basic life support skills
CLOBJ 3	Breathing techniques
CLOBJ 4	Recognition of Circulatory Emergencies
CLOBJ 5	Wound Care and Bleeding Control
CLOBJ 6	Shock management

f. Course Learning Outcomes:

CLO 1	Understand the importance of first aid in emergency situations.
CLO 2	Demonstrate the ability to assess the scene of an emergency.
CLO 3	Identify and prioritize different types of injuries and illnesses.
CLO 4	Learn and practice CPR techniques for adults, children, and infants and use ofautomated external defibrillators (AEDs) and how to use them.

CLO 5	Understand the importance of infection control in wound care.
CLO 6	Identify signs and symptoms of shock and how to provide first aid for differenttypes of burns and how to assess and provide first.

g. Teaching scheme

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
4	**-**	**-**	**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Introduction to first aid:** Aims of first aidThe first aider. First aid and the law Indian good Samaritan protection guidelines Duty of giving care, Consent of the person in need Privacy Negligence, Dealing with an emergency Top-to-toe assessment Hygiene and hand washing First aid overview flow chart	7	4
2	**Assessment of patients with fractures, wounds, and bleeding:** Brief Anatomy of the skeletal system, Fractures (injuries to bones) Injuries and fractures to the head, neck and spine Injuries and fractures to the cheekbone, nose and lower jaw, Fracture of the cheekbone or nose Fractures of the lower jaw Injuries to the shoulder, ribs or breastbone Injuries or fractures of the shoulder Injuries and fractures of the collarbone Rib injuries and fractures. Fractures of the breastbone Injuries to the arm, elbow, wrist, hand or Injuries and fractures of the arm(upper arm, forearm, wrist) Injuries and fractures of hand or fingers Injuries to the pelvis, lower limbs, knee, ankle or feet Injuries and fractures of the pelvis Injuries and fractures of the leg (thigh or lower leg) or ankle Fracture of the knee cap (patella) Injuries and fractures of foot or toes Dislocations (injuries to joints) Strains and sprains (injuries to ligaments, muscles and tendons)	10	6
3	**Respiratory emergencies:** Respiration- The respiratory system No breathing or difficult breathing When to refer the casualty to a healthcare facility,Drowning: Remove the victim out of the water Strangulation and hanging Choking Swelling within the throat Suffocation by smoke or gases Asthma	10	6
4	**Care of burns:** The skin Burn wounds First, second and third degreeburns. Type of burns by originDanger of burn. Dry burns and scalds (burns from flames, hot surfaces, steam, Care of minor burns (small first and second degree burns)Specific burn locations Electrical burns and electrocution by electricity or	8	5

	lightning, Chemical burns, Sunburns, snow/welders eyes, heat exhaustion and heat stroke, Heat exhaustion, Heatstroke, Frostbites, Prevention of burns, Fever, Hypothermia		
5	**Lifesaving procedures in emergency & shock:** The heart and the blood circulation, Heart and blood circulation, Blood pressure, Pulse, The blood, Chest discomfort, Bleeding, First aid for bleeding (in general), Resuscitation (basic CPR), Resuscitation of a person who is not breathing or not breathing normally, Resuscitation of baby/child (less than one year old)	8	5
6	**Head trauma & stroke:** The nervous system, The central nervous system, Theperipheral nervous system (PNS), Unconsciousness, Head injuries, Concussion, Cerebral compression, Skullfractures, Stroke, Fits – convulsions - seizures	10	6
7	**Gastrointestinal tract, diarrhea, food poisoning anddiabetes:** Review of anatomy and physiology of gastrointestinal tract, Diarrhoea, Prevent dehydration, Food poisoning, Diabetes, Type 1 diabetes, Type 2 diabetes, Gestational diabetes (diabetes during pregnancy), Diagnosis, Hyperglycaemia, Symptoms of hyperglycaemic coma or diabetic coma, Hypoglycaemia	10	6
8	**Senses, foreign bodies in eye, ear, nose or skin andswallowed foreign Objects:** Review of anatomy and physiology of the special senses, Foreign body in the eye, Foreign body in the ear,Foreign body in the nose, Foreign body in the skin, Swallowed foreign objects	10	6
9	**Urinary system, reproductive system and emergencychildbirth:** Review of anatomy and physiology of Urinary & Reproductive system, Male reproductive system, Female reproductive system, Pregnancy, Stages of labour and giving birth, Aftercare of the mother, Medical conditions and pregnancy, Diabetes, High blood pressure, Infections, Prevention of sexually transmitted diseases (STD), Sexually transmitted infections, Reducing the risk of STDS/STIS, Emergency childbirth.	10	6

10	**Psychological first aid:** Definition of psychological first aid, Traumatic crisis, (psychological) shock phase, Reaction phase, Processing phase, Reorientation phase, Behave calmly, Listening to the affected person, Physical contact, Providing psychological first aid to all	7	4
11	**Specific emergency situations and disaster management:** Emergencies at school, Emergencies at work, Road and traffic accidents, Emergencies in rural area, Disasters and multiple casualty accidents Emergency triage	10	6
	Total	**100%**	**45**

i. Textbook and Reference Book:

1. **First aid handbook: Fast and effective emergency care** (TextBook), By Dr. PipaKeech | 3rd
2. **Until Medical Help Arrives: First aid Book** (TextBook), By Dr. H. V. Sardesai |1stEdition, Pub. Year 2022
3. **First aid manual**, (TextBook), By UK's Leading First aid providers | 11th edition:, Pub. Year 2021

a. Course Name: Basic English-I

b. Course Code: 00019301AE01

c. **Prerequisite:** Basic Knowledge of LSRW. To provide students withsoft skills that complement their skills, making them more marketable when entering the workforce.

d. Rationale: Knowledge of LSRW is essential for students.

e. Course Learning Objective:

CLOBJ 1	Communication Skills
CLOBJ 2	Vocabulary Building
CLOBJ 3	Grammar Fundamentals
CLOBJ 4	Reading Comprehension
CLOBJ 5	Listening Skills
CLOBJ 6	Writing Proficiency

f. Course Learning Outcomes:

CLO 1	Understand the importance of creative and critical thinking.
CLO 2	Develop four basic skills (LSRW)
CLO 3	Expand vocabulary with proper pronunciation.
CLO 4	Comprehend the basics of English grammar.
CLO 5	Read & write effectively for a variety of contexts.
CLO 6	Develop confidence in speaking skills.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
2	**-**	**0**	**2**	**-**	**-**	**-**	**100**	**-**	**100**

L- Lectures; **T-** Tutorial; **P-** Practical**; C-** Credit**; MSE-** Mid-Semester Evaluation**, CE-** ContinuousEvaluation**, ESE-** End Semester Examination

h. Course Content:

Sr. No	Content	Weightage (%)	Teaching Hours
1	1) Listening Vs Hearing 2) Types of listening 3) Traits of good listener 4) Barriers of listening	5	2
2	1) Listening Practice (Audio & Video)	10	3
3	1) Defining the purpose of presentation 2) Presentation strategies 3) How to make an effective presentation 4) Knowing /Analysing audience 5) Organizing content and preparing an outline 6) Traits of a good speaker	10	1
	1) Crazy Scientist	5	2
4	1) Speaking practice (Elocution)	10	7
5	1) Define reading 2) Reading Strategies 3) Techniques of reading	5	1
	4) Techniques to read faster		
6	1) Reading practice:(Reading comprehension)	10	4
7	1) Develop writing skills 2) 7cs of communication 3) Techniques of writing better Identifying common errors in writing	15	3
8	1) Introduction of paragraph writing 2) Central components of paragraphdevelopment Techniques for paragraph development	5	1
9	1)Writing practice: (Note making, picture description, dialogue writing, paragraph writing, completion of story from given points and essay writing)	25	6
	Total	**100%**	**30**

Text Book and Reference Book:

1. **Understanding and Using English Grammar**, By Betty Azar & Stacy Hagen | Pearson Education
2. **Business Correspondence and Report Writing**, By SHARMA, R. AND MOHAN,K.
3. **Communication Skills,** By Kumar S And Lata P | New Delhi Oxford

UniversityPress
4. **Technical Communication** : Principles And Practice, By Sangeetha Sharma,Meenakshi Raman | Oxford University Press
5. **Practical English Usage,** By MICHAEL SWAN
6. **A Remedial English Grammar** for Foreign Student, By F.T. WOOD
7. **On Writing Well**, By William Zinsser | Harper Paperbacks,2006 | 30th anniversaryedition
8. **Oxford Practice Grammar**, By John Eastwood | Oxford University Press

a. **Course Name: Basic Photography**
b. **Course Code: 18010201UE01**
c. **Prerequisite:** 1) Understanding of Basic Computer Skills 2) Media Literacy 3) CreativeVision 4) Passion to learn
d. **Rationale:** Taking a basic photography course can be incredibly helpful for anyone looking to improve their photography skills. Not only will you learn about the technicalaspects of photography, but you'll also gain a greater appreciation for the art form and discover your own unique style.
e. **Course Learning Objective:**

CLOBJ 1	Remember different focal lengths and their aesthetic uses, enabling them to chooseappropriate lenses based on specific photographic needs
CLOBJ 2	Understanding of digital camera mechanisms, including aperture, shutter speed, ISO,and their significance in photography.
CLOBJ 3	Implement knowledge and skills related to marketing and promoting their photography work, including strategies for selling, exhibiting, participating in competitions, and understanding current marketing trends in the photography industry.
CLOBJ 4	Analyse about metadata and its role in photography, particularly in manipulating technical information using RAW technology and software like Photoshop to enhanceimage quality.
CLOBJ 5	Access various techniques and methods to express their creative vision through photography, experimenting with different styles and approaches in the digital realm.
CLOBJ 6	Develop skills in composing visually appealing photographs by understanding the principles of composition and arranging visual elements within the frame effectively.

f. **Course Learning Outcomes:**

CLO 1	Remember some component of photography and Improved technical skills: Basic photography classes will teach you the fundamentals of camera operation, exposure, and lighting.

CLO 2	Understand how to use your camera to its full potential and create images that areproperly exposed and well-lit.
CLO 3	Apply the ability to use natural and artificial light effectively to enhance the visualimpact of their photographs
CLO 4	Analyse By learning about composition, colour, and perspective, you'll be able to createimages that are not only technically proficient but also visually compelling.
CLO 5	Assess proficiency in operating and adjusting camera settings to achieve proper exposure.
CLO 6	Create vision and explore different styles of photography.

g. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
2	-	4	4	20	20	20	60	30	150

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Digital Camera Mechanism :** A basic photography course will help you understand the features of a Digital camera Mechanism, such as aperture, shutter speed, ISO, and how to use them effectively to create thekind of photos you want. **Characteristic of Lens:** Different focal lengths has different aesthetical use. According to need we'll choose our Lens. **Aesthetic of Composition:** In terms of Visual Experience composition is a very important element. It Is the arrangement of visual elements within the frame of the photograph.	33	10
2	**Experience the Metadata**: Metadata is actually the technical information about the photograph, Using RAW technology we can manipulate the metadata through 'Photoshop'. **Experiment on Expression:** An Image is actually the expression of the photographer. How does he/she sees a particular thing or incident. In Digital era we can do various experiment on our expression and enhance the expression. **Business and Marketing for Photographers :** This is the most crucial part of the field, through the curriculum we'll learn how to sell or exhibit our photograph, how to take part in various competition and learn about the present marketing strategy.	33	10

3	**Documentary Photography:** Apart from the fiction, there is parallel world of documentary Photography. Great photographers like Kevin Carter, Danish Siddiqui has devoted there life in Documentary Photography and Photo Journalism. Students need to go out and Practically grab some images from daily livelihood of the society. **Photographers Study :** Students need to study great photographers and their work bothfrom fiction and non- fiction genre	34	10
	Total	**100%**	**30**

Text Book and Reference Book:

1. **Basic Photography,** By Michael Langford | Focal Press
2. **Digital Photography complete course**: Everything you need to know in 20 weeks, By Patel, N. |DK Publishers, USA, Pub. Year 2021
3. **Handbook of Photography**, By James A. Folts & Ronaldo P. Lovel

List of Experiment:

Sl. No.	Title
1.	Landscape: A picture that reflects you A photostory with 3 pictures and 5 pictures
2.	Photos on a particular topic
3.	Assignments for photography
4.	List of experiments for basics of photography

a. **Course Name: Introduction to MATLAB Programming**
   Course Code: 03010901UE01
b. **Prerequisite:** Fundamental Knowledge of Mathematics.
c. **Rationale:** An Introduction to MATLAB Programming" course is essential because MATLAB is widely used in scientific and engineering fields for data analysis, simulations, and algorithm development. Its user-friendly interface and high-level language allow beginners to quickly grasp fundamental programming concepts and focus on problem-solving. The course equips learners with valuable skills for data visualization, numerical computing, and rapid prototyping, enhancing their capabilities and employability in diverse domains.
d. **Course Learning Objective:**

CLOBJ 1	Remember foundational understanding of MATLAB syntax, data types, and basic programming concepts such as variables, arrays, and control structures.

CLOBJ 2	Explain the principles of problem-solving using MATLAB, including algorithm development, debugging techniques, and code documentation.
CLOBJ 3	Apply MATLAB programming skills to solve a variety of computational problems,including mathematical calculations, data analysis, and visualization tasks.
CLOBJ 4	Analyse and debug MATLAB code to identify errors, optimize performance, andimprove code efficiency.
CLOBJ 5	Evaluate the effectiveness of different MATLAB programming techniques and strategies in solving specific types of problems, considering factors such as code readability, scalability, and computational efficiency.
CLOBJ 6	Develop their understanding of MATLAB programming concepts to design andimplement their own algorithms and functions to solve complex problems.

e. Course Learning Outcomes:

CLO 1	Memorize the MATLAB environment with confidence, effectively utilizing its featuresand tools for programming and data analysis.
CLO 2	Understand matrices and arrays, perform basic operations, and visualize data using 2Dand 3D plots for effective data exploration and representation.
CLO 3	Compare programming concepts like control statements, loops, and logical operationsto write structured MATLAB code for problem-solving.
CLO 4	Analyse & distinguish and use user-defined functions, promoting code reusability andmodular design in MATLAB programs.
CLO 5	Evaluate Work with file input/output, enabling data exchange with external sources,and utilize the Symbolic Math Toolbox for performing symbolic computation.
CLO 6	Creative ability to independently solve problems using MATLAB.

f. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
4	**-**	-	**4**	**20**	**20**	-	**60**	-	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

g. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Getting Started with MATLAB:** Introduction to MATLAB, history, features, and uses, MATLAB desktop, basic commands, variables, and data types, performing arithmetic operations andusing functions.	13	6
2	**Working with Matrices and Arrays:** Creating Matrices and Arrays, Array Operations and Indexing, Logical Operations andRelational Operators	18	8
3	**Data Visualization in MATLAB:** Visualizing data using 2D plots and 3D Plot, Customizing Plots, Enhancing plots with titles, labels, and formatting.	18	8
4	**Programming with MATLAB:** Conditional Statements (if-else), loops (for and while), Vectorization and Logical operation	18	8
5	**Working with Files and Symbolic Math:** Reading from and writing to files, data import/export, performing symbolic computations using Symbolic Math Toolbox	18	8
6	**Reading Skills:** Define reading, Reading Strategies, Techniques of reading, Techniques to read faster	15	7
	Total	**100%**	**45**

h. Text Book and Reference Book:

1. **MATLAB : PROGRAMMING FOR ENGINEERS** (TextBook), By Chapman, Stephen J ., | Thomson Asia Pvt Ltd ,
2. **Mastering Matlab, A Comprehensive tutorial and reference**, By Duane Hanselman and BruceLittletied,
3. **Getting Started with MATLAB-7** (TextBook), By Rudra Pratap | OXFORD University Press

a. Course Name: Office Automation

b. Course Code: 0501001UE01

c. Prerequisite: Basic computer literacy.

d. Rationale: The objective of this course is to familiarize students with concepts of fundamentals ofMicrosoft Office, Excel, PowerPoint and Outlook for working of computer and its application.

e. Course Learning Objective:

CLOBJ 1	Remember understanding of what office automation entails, including the use of technology to streamline office tasks, improve efficiency, and enhance productivity.
CLOBJ 2	Understand the advantages of office automation, such as increased accuracy, reducedmanual labor, faster processing times, and improved communication and collaboration.
CLOBJ 3	Apply the role of office automation tools and technologies in contemporary workplaces, including their impact on workflow optimization, remote work, and digital transformation.
CLOBJ 4	Organize office automation systems to integrate with various business processes, including document management, workflow automation, customer relationship management, and enterprise resource planning.
CLOBJ 5	Evaluate the challenges and considerations associated with implementing office automation solutions, such as cost, compatibility, data security, and employee training.
CLOBJ 6	Develop Strategies for Successful Implementation: Students will develop strategies for successful implementation of office automation initiatives, including assessing organizational needs, selecting appropriate technologies, managing change, and evaluating outcomes.

f. Course Learning Outcomes:

CLO 1	Demonstrate understanding of the concept of office automation, including its components, functions, and applications in modern workplaces.
CLO 2	Understand the importance and benefits of office automation, recognizing its role inenhancing efficiency, productivity, and communication in organizations.
CLO 3	Analyse the challenges and considerations associated with office automation implementation, such as technological limitations, organizational culture, and securityconcerns.
CLO 4	Apply their knowledge of office automation to analyze and evaluate its integration with business processes, identifying opportunities for automation and efficiency improvements.
CLO 5	Evaluate the effectiveness of office automation solutions in addressing organizational needs and improving workflow processes, considering factors such as cost- effectiveness, user satisfaction, and return on investment.
CLO 6	Synthesize their understanding of office automation concepts to develop strategies for successful implementation, including assessing organizational needs, selectingappropriate technologies, and managing change.

g. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
3	-	2	4	20	20	20	60	40	150

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Introduction to Office Automation:** Overview of Office Automation, Importance and Benefits of Office Automation, Role in Modern Work Environments, Integration with BusinessProcesses, Challenges and Considerations.	8	4
2	**Introduction of Computer:** Overview of Computer, Computer Input and Output devices, Operating System, hardware and Software Introduction to Ram ,Rom ,CPU and more devices.	8	4
3	**Microsoft Word:** Introduction to MS Word, Getting Familiar with the Interface, Creating a New Document, Basic Text Formatting, Bold, Italic, Underline), Aligning Text (Left, Center, Right),Saving and Opening Documents,Navigate Through a Document, Insert hyperlinks, Search for text, Replace, Create bookmarks, Move to a specific location or object in a document, Apply document themes, Apply document style sets, Insert headers and footers, Insert page numbers, Format page background elements, Create a numbered or bulleted list, Change bullet characters or number formats for a list level, Define a custom bullet character or number format.	25	11
4	**Microsoft Excel:** Introduction to MS Excel Create a workbook, Search for data within a workbook, Change worksheet tab color, Rename a worksheet, Insert and delete columns or rows, Change workbook themes, Adjust row height and column width, Insert headers and footers, Hide or unhide worksheets, data validation, Duplicate Values, Apply styles to tables, Filter records, Sort data by multiple columns, Change sort order, Remove duplicate records, Perform calculations by using the SUM function, MIN and MAX functions, COUNT function, AVERAGE function, Create a new chart, Resize charts, Save a workbook as a template, Manage workbook versions, Protect aworksheet	25	10
5	**Microsoft PowerPoint:** Create a Presentation, Insert and Format Slides, Modify Slides, Handouts, and Notes, Configure	17	8

	a Presentation for Print, Configure and Present a Slide Show, Insert and Format Text, Insert and Format Shapes and Text Boxes, Insert and Format Images, Order and Group Objects, Insert and Format Tables, Insert and Format Charts, Insert and Format SmartArt graphics, Apply Slide Transitions, Animate Slide Content. Set Timing for Transitions and Animations.		
6	**Microsoft Outlook**: Create messages, Create and send messages Configure message, Format messages, Format text Apply, themes and styles, Apply styles, Create hyperlinks, Insert images, Manage schedules, Insert memorized content, Insert signatures, Configure calendar settings ,Work with multiple calendars Share calendar information, Create appointments and events Create meetings Manage calendar items, Create tasks Manage tasks Create and manage notes, Create journal entries, Create and manage contacts Create and modify contact records Store contact records Share contact records and address books.	17	8
	Total	**100%**	**45**

Text Book and Reference Book:

1. **Digital Logic and Computer Design** (TextBook), By Morris Mano | PHI
2. **Introduction to Information Technology, By ITL Education Solution Limited** | Pearson Education
3. | 2012
4. **MS OFFICE 2007**, By Vikas Gupta | Wiley
5. **Computer Fundamentals**, By Anita Goel | Pearson Education | 2011
6. **Digital Fundamentals**, By Thomas L Floyd | Pearson

List of Experiment:

1	**Case study on salary calculation Calculate Allowance based on given Condition.** 1. HRA is 10% on Basic Salary if Salary more than 20000. 2. DA is on 25% on Basic Salary. 3. Medical Allowance (MA) = Executives get MA Rs 1000, Officers get MA Rs 700 & Assistants get MA Rs 500 4. Calculate Gross Salary. Gross Salary = Total of Basic + HRA + DA + MA 5. Calculate Professional Tax Upto 5000 = 0, upto 1000 = 60, upto 15000 = 100 & over 15000 = 150 6. Calculate Annual Salary 7. Calculate Income Tax Upto 100000 = 0, then 50000 = 10%, then 100000 = 20%, over 250000 = 30% Hint:Formula =IF(K2<=100000,0,IF(K2<=150000,(J2- 100000)*10%,IF (K2<=250000,(K2-150000)*20%+5000,(K2-250000)*30%+25000))) 8. Calculate Net Salary Payable Annual salary - income tax

2	**Formatting alignment and creating table** 1. Type in the Title Microsoft Word ComputerTrainingManual 2. Text formatting: Times New Roman font, size 14, Bold and Blue. Paragraphformatting: Align Center. 3. Type in the first paragraph. Text formatting: Arial font, size 11. Paragraph formatting: Align Justify, First Line Indent at 0.5 Type the notes
3	Word art and clip art Prepare visiting card for caterrer service in word 2007 Prepareinteractive word document (apply all formatting style)
4	**Macro creating macro**
5	Invitation letter format The format of invitation is as shown below: Anand Institute of Information Science, Shri. Ramkrishna Seva Mandal Opp. Town Hall, Anand 388 001 Ph. No. (02696) 266062 To, The Director/Principal, The name of Institute _ The address of Institute
6	**Work sheet exercise** 1. Insert a column Number of Teams between columns Year and Tickets sold with values Insert a row between row 3 and row 4 with values Delete column Revenue Rename the Sheet1 with name Format cells Delete Sheet3. 6. Hide row 4. 7. Insert a sheet and rename it with name
7	**Table exercise Complete the following tasks:** a) Widen the first column to 15. b) Add a row beneath the details on Southampton to show the average monthly rainfall. c) Add a new column after the June rainfall statistics to show the total rainfall in eachcity over the period. d) The rainfall in Birmingham during March should be 58. e) Insert a new row between the rows holding the London and Sheffield rainfall statistics. Enter the following details: Newcastle 65 63 57 50 39 21 f) Copy the appropriate formula to obtain the total rainfall for Newcastle during theperiod.
8	Table column exercises. Change the column width of column B to 15. 2. Change column width of column D to G to 20. 3. Change column width of column A and B to 14 4. Calculate Total Sales for each item and store result in column D. Hint: Total sales=Quantity * Unit Price. 5. Calculate Total Sales for all the items and store result in cell B6. 6. Copy Unit Price for PC in cell D7. Move Total sales from cell B6 to D8.

9	Insert remove columns of table Complete the following tasks: a) Add a Units Used column to show the number of units of electricity used by eachcustomer (Hint: Subtract the Previous Reading from the Present Reading). b) The cost of one unit of electricity is Rs.0.08. Add a Unit Cost column to show the costof one unit. (This column will contain 0.08 in all of the relevant cells). c) Add a Units Charge column to show the total cost of the units used by each customer.(Hint: Unit Cost * Units Used) d) There is a standing charge of Rs.13.60 on each customer's account. Add a column todisplay this Standing Charge. (This column will contain Rs.13.60 in all of the relevant cells).
10	**Math functions The functions and commands required to solve the following assignment are as follows:** Enter data - labels and values 1. Editing cell contents 2. Saving a spreadsheet 3. Alteringcolumn widths 4. Using the SUM function 5. Adding a new row after the last row of data 6. Adding a new column after the last column of data 7. Copying a formula 8. Using the AVERAGE, MIN, MAX function 9. Inserting a new row between existing rows Insertinga new column between existing columns
11	Table formatting using background color Format the Student Grades so that your spreadsheet looks like the one below (you can use different colours, if you like).
12	Calculate total sale and commission based on given details in table
13	Filter data of excel sheet 1. Count number of order in Boston. 2. Count number of Microwave order. 3. Count number of journeys with truck 3. 4. Count number of Peter White journeys. 5. How many times is no. of items less than 20. 6. Display sum of refrigerator items. 7. Display sum of washing machine items. 8. Display sum of items transported by truck 4. 9. Sum of items transported by trucks. 10. Number of microvawe orders in Boston . 11. Number of Peter White journeys with truck 1. 12. Number of orders in Boston after 2/3/2013: 13. Number of orders between 2/3/2013 and 2/6/2013: 14. sum of microwaves transported to NY: 15. sum of items transported to Pittsburgh by truck 1: 16. sum of items ordered between 2/3/2013 and 2/6/2013: 17. Sum of items transported to NY, Baltimore and Philadelphia
14	Conditional formatting do conditional formatting on the excel sheet in given data
15	Sorting sort given data of excel sheet

16	Typing excercise aq1 qa sw2ws de3ed fr4rf gt5tg queen 11 queens 1 apple 11 apples 2wishes 22 wishes 2 swims 22 swims eddies 33 eddies 3 deeds 33 deeds 4 roses 44 roses 4 fish 44 fish tugs 55 tugs 5 goats 55 goats
17	Water mark and header footer inserting and removing
18	Power point presentation creating presentation
19	PPT add timing and sound effects
20	Access creates data base, tables create db, tables
21	Access, relations between tables relations between tables

a. **Course Name: Sensory Evaluation**
b. **Course Code: 11011301SE01**
c. **Prerequisite:** Should be familiar with basic of Sensory Evaluation
d. **Rationale:** Acquire knowledge about the Sensory Evaluation
e. **Course Learning Objective:**

CLOBJ 1	Understanding factors that affect taste and odour of food.
CLOBJ 2	Understanding the various techniques to measure texture, colour.
CLOBJ 3	Gaining knowledge about methods of sensory evaluation
CLOBJ 4	Understanding chemistry involved in sensory perception

f. **Course Learning Outcomes:**

CLO 1	Analyze and Evaluate factors that affect taste and odour of food.
CLO 2	Evaluate and build how food texture is perceived and measured.
CLO 3	Evaluate and define how colour in food is perceived and measured.
CLO 4	Learn and utilize methods of Sensory evaluation

g. **Teaching & Examination Scheme:**

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	

2	**-**	**0**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Quality control** Objectives, importance, and functions of quality control. Methods of quality, assessment of food materials-fruits, vegetables, cereals, dairy products, meat, poultry, egg and processed food products Terminology related to sensory evaluation.	25	6
2	**Sensory Evaluation** Sensory Evaluation: Sensory characteristics of food- Appearance, colour , Flavour, Psychological Factors.	20	6
3	**Sensory Tests** Reasons for testing food quality, Trained Panel Members, Testing Laboratory, Preparation of sample, Techniques ofsmelling and tasting, Testing Time .	20	6
4	**Objective of Evaluation.** Objective of Evaluation; - Advantages & Disadvantages, Basic Guidelines, Test usedfor Objective Evaluation	15	6
5	**Texture Evaluation** Instruments used for Texture Evaluation:Instrument used for liquid and semisolids Texture Analyzers (Textureometers) Tensile Testers Penetrometers	20	6
	Total	**100%**	**30**

Text Book and Reference Book:

1. **Food science** By B. Srilakshmi
2. **Food Quality and Sensory Evaluation** By Mr. V.R. Chavan, Dr. M.D. Sontakke andDr. R.V. Kale

(6)

a. Course Name: Climate Change & Sustainable Environment

b. Course Code: 11011401VA01

c. Prerequisite: Shall have the basic knowledge about environmental studies

d. Rationale: Will understand the basic interface between climate change and sustainability.

e. Course Learning Objective:

CLOBJ1	Understanding the complexity and operations of governance systems and processes on international, national, and local levels.
CLOBJ2	Understanding the differences between government and governance and the various ideas and meanings attached to the goal of sustainable development.
CLOBJ3	Understanding the policy-making processes in regard to sustainability issues.

CLOBJ4	Gaining knowledge about written and verbal communication skills

f. Course Learning Outcomes:

CLO 1	Identify the complexity and operations of governance systems and processes oninternational, national, and local levels.
CLO 2	Explain the differences between government and governance and the various ideasand meanings attached to the goal of sustainable development.
CLO 3	Critically analyze policy-making processes in regard to sustainability issues.
CLO 4	Apply high-quality written and verbal communication skills

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
2	**-**	**0**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage (%)**	**Teaching Hours**
1	**Introduction to Climate Change** Global Climate SystemClimate Change: Causes and Consequences: Global warming, ozone layer depletion, acid rain, and greenhouseeffect case studies: nuclear accidents, chemical disasters,	33	10

	and climatic episodes		
2	**Sustainable Development:** Sustainable Development Goals: An overview Climate Change and Sustainable Development: National and State Policies Achieving Sustainable Development Goals: Role of Various Stakeholders Building Partnership for Climate Change and SustainableDevelopment	34	10
3	**Sustainable Approach to Climate Change:** Energy Conservation: Use of Renewable energies: Water, Solar, Wind, Tidal, Geothermal Water conservation techniques: RainWater Harvesting. Environmental Ethics & Public Awareness: Role of various religions and cultural practices inenvironmental conservation Sustainable Human Development.	33	10
Total		**100%**	**30**

i. Text Book and Reference Book:

a. **Climate Change and Sustainable Development: Prospects for Developing Countries**By Anil Markandya, Kirsten Halsnæs

b. **Climate Change and Sustainable Development Global Prospective** By R.K.Mishra,P.s.Janki Krishna & CH. Laskhmi Kumar

c. **This Changes Everything: Capitalism** vs The Climate By Naomi Klein

d. **The Uninhabitable Earth: Life After Warming** (TextBook) By Davi Wallace-Wells

Semester 2

a. Course Name: Basic English – II

b. Course Code: 00019302AE04

c. Prerequisite: Knowledge of Basic English-I

d. Rationale: Knowledge of Communication is essential for students.

e. Course Learning Objective:

CLOBJ1	Develop the ability to understand and analyse various types of texts, including fictionand non-fiction.
CLOBJ2	Enhance the ability to write clear and concise essays with proper organization andcoherence.
CLOBJ3	Focus on common grammar issues such as verb tenses, subject-verb agreement, andsentence punctuation.
CLOBJ4	Practice active listening and respond appropriately to various types of oral communication.

CLOBJ5	Understand the importance of revising and rewriting to improve writing skills

f. Course Learning Outcomes:

CLO 1	Construct grammatically correct sentences.
CLO 2	Develop and deliver professional presentation skills
CLO 3	Develop confidence in speaking skills.
CLO 4	Develop the skills of critical thinking.
CLO 5	Compose different types of written communication.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
2	**-**	**-**	**2**	**-**	**100**	**-**	**-**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage (%)**	**Teaching Hours**
1	**Definition, Importance and Process of Communication** Definition of Communication & Importance ofCommunication Definition and process of communication	7	2
2	**Levels and Flow of Communication** Levels of CommunicationFlow of Communication	7	2
3	**Barriers and features of Effective Communication** Barriers to effective CommunicationFeatures of effective Communication	7	2
4	**Non-verbal Communication and Kinesics** Define non-verbal communication	3	1

	Kinesics		
5	**Proxemics, Paralinguistic and Chronemics** Proxemics Paralinguisti cChronemics	3	1
6	**Error Analysis** Error Analysis (Tenses, voices & Reportedspeech)	7	2
7	**Reading Comprehension** Reading Comprehension	3	1
8	**Vocabulary Building Vocabulary Building** Idioms Phrases Synonym s Antonym s	7	2
9	**Theatrics (Role Play)**Theatrics (Role Play)	16	5
10	**Extempore** Extempore	16	5
11	**Application Writing** Application Writing	10	3
12	**Letter writing** Letter writing (Elements, Layouts, Inquiry,Complain, & Adjustment,)	14	4
	Total	**100%**	**30**

i. Text Book and Reference Book:

1. **Business Correspondence and Report Writing** SHARMA, R. AND MOHAN, K.
2. **Communication Skills Kumar** S and Lata P; New Delhi Oxford University Press
3. **Practical English Usage** MICHAELSWAN
4. **A Remedial English Grammar** for Foreign Student F.T. WOOD
5. **On Writing Well** William Zinsser; Harper Paperbacks, 2006; 30th anniversary edition
6. **Oxford Practice Grammar,** John Eastwood; Oxford University Press
7. **Technical Communication**: Principles and Practice Sangeetha Sharma, Meenakshi Raman;Oxford University Press.

2)

a. Course Name: Mathematical Aptitude

b. Course Code: 00019101SE01

c. Prerequisite: Basic numeracy skill

d. Rationale: Mathematical aptitude refers to the ability to reason, think critically, and applymathematical principles to solve problems and make sense of the world around us.

e. Course Learning Objective:

CLOBJ1	Develop the ability to analyze and solve a variety of mathematical problems using appropriate techniques and methods.
CLOBJ2	Improve numerical reasoning skills, including the ability to understand and interpret numerical data, perform calculations accurately, and draw conclusions from numerical information.
CLOBJ3	Introduce the concept of mathematical modeling and its application in solving real-world problems.
CLOBJ4	Develop adaptability in applying mathematical concepts to diverse situations, recognizing the flexibility of mathematical thinking.
CLOBJ5	Integrate ethical considerations in mathematical reasoning, emphasizing the importance of ethical behavior in mathematical applications.

f. Course Learning Outcomes:

CLO 1	Analyse and interpret mathematical problems, devise appropriate strategies, andapply relevant mathematical concepts and techniques to find solutions.
CLO 2	Comprehend and manipulate numerical information effectively, make accuratecalculations, and interpret numerical data in various contexts.
CLO 3	Think critically and logically, recognize patterns and relationships, and constructlogical arguments using mathematical principles.
CLO 4	Apply these concepts and techniques to solve real-world situations.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
2	**-**	**0**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Unit-1** Numbers, HCF & LCM, Square Root & Cube Root, Ratio & Proportion, Permutations & Combinations, Percentage, Average-Shortcut averages, Partnership, Time -work & distance, Boats & streams, Mixtures, Logarithms	40	12
2	**Unit-2** Progression (AM, GM, HM), Series, Interest (S.I. & C.I.) and depreciation rate, Profit-Loss & Discount, Equations (Linear & Quadratic), Probability.	40	12
3	**Unit-3** Mensuration I (Area & Perimeter), Mensuration II(Volume &Surface area), Grouped Data, Ungrouped Data(Mean and Standard Deviation) Data interpretation: (Tabulation, Bar Graph, Pie Chart, Line Chart).	20	6
	Total	**100%**	**30**

i. Text Book and Reference Book:

1. Quantitative Aptitude for Competitive Examinations (Textbook) By D. Khattar | PersonIndian Education Service

2. Verbal Reasoning and Non - Verbal Reasoning (TextBook) By B. S. Sijwali and InduSijwali | New Delhi: Arihant

3. Quantitative Aptitude for Competitive Examinations by R. S. Aggarwal | S. ChandPublishing,

3)

a. Course Name: IPDC including history and culture of India and IKS-I

b. Course Code: 00019302VA01

c. Rationale: IPDC aims to prepare students for the modern challenges they face in their daily lives. Promoting fortitude in the face of failures, Unity amongst family discord, Self-discipline amidst Distractions... and many more priceless lessons. The course focuses onmorality and character development at the core of student growth, to enable students to become self-aware, sincere, and successful in their many roles - as an ambitious student,reliable employee, caring family member, and considerate citizen.

d. Course Learning Objective:

CLOBJ 1	Exploring the key philosophical concepts from classical Indian philosophiessuch as Vedanta, Nyaya, Sankhya, Yoga, and Mimamsa.

CLOBJ 2	Analysing sacred texts like Vedas, Upanishads, Bhagavad Gita, and other classical literature.
CLOBJ 3	Delving into traditional Indian arts, music, dance, and architecture.
CLOBJ 4	Examining ethical principles embedded in Indian culture and how they relate tocontemporary issues.
CLOBJ 5	Encouraging students to critically evaluate and interpret traditional knowledgein a modern context.

e. Course Learning Outcomes

CLO 1	Provide students with a holistic value-based education that will enable them to besuccessful in their academic, professional, and social lives.
CLO 2	Give the students the tools to develop effective habits, promote personal growth,and improve their well-being, stability, and productivity.
CLO 3	Allow students to establish a stronger connection with their family through critical thinking and development of qualities such as unity, forgiveness, empathy, and effective communication.
CLO 4	Provide students with soft skills that complement their hard skills, making themmore marketable when entering the workforce.
CLO 5	Enhance awareness of India's glory and global values, and to create considerate citizens who strive for the betterment of their family, college, workforce, and nation.
CLO 6	Inspire students to strive for a higher sense of character by learning from rolemodels who have lived principled, disciplined, and value-based lives.

b. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
0	**-**	**2**	**1**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

c. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Introduction**: The Need for Values: Students will learn about the need for values as part of their holistic development to become successful in their many roles - as ambitious students, reliable employees, caring family members, and considerate citizens.	7	2
2	**Remaking Yourself Restructuring Yourself:** Students learn how self-improvement enables them to secure a bright future for themselves. They will learn 6 powerful thought-processes that can develop their intellectual, physical, emotional, and spiritual quotients	7	2
3	Remaking Yourself Power of Habit: Students will undergo a study of how habits work, the habits of successful professionals, and the practical techniques that can be used to develop good habits in their life.	7	2
4	Learning from Legends Tendulkar & Tata: Students will learn from the inspirational lives of India's two legends, Sachin Tendulkar and Ratan Tata. They will implement these lessons through relatable case studies.	7	2
5	From House to Home Listening & Understanding: Activ listening is an essential part of academic progress and communications. Students will learn to listen with their eyes, ears, mind, and heart.	6	2
6	Facing Failures Welcoming Challenges: This lecture enables students to revisit the way in which they approach challenges. Through the study of successful figures such as Disney, Lincoln and Bachchan, students will learn to face difficulties through a positive perspective.	6	2
7	Facing Failures Significance of Failures: Failure is a student's daily source of fear, negativity, and depression. Students will be given the constructive skills to understand failure as formative learning experiences.	6	2
8	My India My Pride Glorious Past - Part 1: India's ancient Rishis, scholars, and intellectuals have made tremendous contributions to the world, they developed an advanced, sophisticated culture and civilization which began thousands of years ago. Students will learn the importance of studying India's glorious past so that they could develop a strong passionand pride for our nation.	6	2

9	My India My Pride Glorious Past - Part 2: Our ancient concepts can be used to seek revolutionary ideas and to generate inspiration. Students will develop a deeper interest in India's Glorious Past – by appreciating the need to read about it, research it, write about it, and share it.	6	2
10	Learning from Legends A.P.J. Abdul Kalam: Dr Kalam's inspirational life displayed legendary qualities which apply to students (1) Dare to Dream (2) Work Hard (3) Get Good Guidance (4) Humility (5) Use Your Talents for the Benefit ofOthers	6	2
11	Soft Skills Networking & Leadership: Students are taught the means of building a professional network and developing aleadership attitude.	6	2
12	Soft Skills Project Management: Students will learn the secrets of project management through the Akshardham case study. They will then practice these skills through an activity relevantto student life.	6	2
13	Remaking Yourself Handling Social Media: Students will learn how social media can become addictive and they will be simplemethods to take back control.	6	2
14	Facing Failures Power of Faith: Students will learn about the power and necessity of faith in our daily lives.	6	2
15	From House to Home Bonding the Family: Students will understand the importance of strong family relationships. They will learn how to overcome the generation gap and connect with their family more.	6	2
16	Selfless Service Seva: Students will learn that performing seva is beneficial to one's health, Wellbeing, and happiness. It alsobenefits and inspires others.	6	2
	Total	**100%**	**30**

j. Text Book and Reference Book:

https://www.youtube.com/watch?v=_C09aqOszv

4)

a. Course Name: Food Chemistry - II

b. Course Code: 11011302DS01

C. Prerequisite: Should be familiar with basic of Food Chemistry.

d. Rationale: Acquire knowledge about the Food Chemistry

e. Course Learning Objective:

CLOBJ1	Understand the role of additives, preservatives, and flavor enhancers in foodproducts.
CLOBJ2	Examine chemical reactions involved in food processing, such as Maillard browning, caramelization, and enzymatic reactions
CLOBJ3	Gain proficiency in advanced analytical techniques used in food chemistry, suchas chromatography, spectroscopy, and mass spectrometry

d. Course Learning Outcomes

CLO 1	Identify and describe the major components of food, including carbohydrates, lipids, proteins, vitamins, minerals, and water.
CLO 2	Explain the chemical structures and functions of these components in food.
CLO 3	Understand how chemical reactions contribute to the development of specific tastes and smells.

e. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		**Total**
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	
2			**2**	**20**	**20**		**60**		**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

f. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Unit 1. Chemistry of Food Flavor** 1. Philosophy and definition of flavor. 2. Functional characteristic of different food flavor. 3. Flavourmatics/ flavouring compounds. 4. Sensory assessment of flavor. 5. Technology for flavor retention.	25	7
2	**Unit 2. Food Additives** **1**. General attributes and classification. 2. Buffer system/salt/acids. 3. Chelating agent and sequestrates. 4. Antioxidant. 5. Antimicrobial agents. 6. Non-nutritive and lowcalorie sweeteners. 7. Stabilizer and thickeners.	25	8
3	**Unit 3. Food Pigments** Heme pigments. Chlorophyll. Carotenoids. Phenolic and flavonoids. Technology for retention of natural colors of food stuff.	25	10
4	**Unit 4 .Enzymes In Food** Type of enzymes. Role of endogenous enzymes in maturation a ripening. Enzymatic browning- mechanism, methods of regulationcontrol . Application of enzymes in food industry.	25	5
	Total	**100%**	**30**

j. Text Book and Reference Book:

1. **Food chemistry** By Fennama O.R.
2. **Food chemistry** By Mayer L.H.

5)

a. Course Name: LAB- I Food Chemistry - II
b. Course Code: 11011302DS02
C. Prerequisite: Should be familiar with basic of Food Chemistry.
d. Rationale: Acquire knowledge about the Food Chemistry
e. Course Learning Objective:

CLOBJ1	Identify and describe the major components of food, including carbohydrates,proteins, lipids, vitamins, minerals, and water.
CLOBJ2	Explain the roles of each food component in the overall composition and functionality of food products.
CLOBJ3	Evaluate the impact of processing on the nutritional quality and sensory attributesof food.

f. Course Learning Outcomes:

CLO 1	Develop proficiency in using laboratory instruments like spectrophotometers andpH meters.
CLO 2	Learn and apply appropriate methods for the preparation of food samples foranalysis.
CLO 3	Understand the importance of representative sampling in food analysis.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
0	**-**	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

List of Experiments:

Sr. No.	Content
1	Determination of food color.
2	Estimation of calcium.
3	Determination of iron.
4	Determination of vitamin A (Total carotenoids)
5	Determination of ascorbic acid by dye method.
6	Study of estimation of trypsin inhibitor activator.
7	Study of Tannin of phytic acid from food.
8	Determination of fat extraction.

h. Text Book and Reference Book:

1. **Food chemistry** By Fennama O.R.
2. **Food chemistry** By Mayer L.H.

6)

a. Course Name: Introduction to Food Technology –II
b. Course Code: 11011302DS03
c. Prerequisite: Should be familiar with basic of Introduction to Food Technology.
d. Rationale: Acquire knowledge about the Introduction to Food Technology
e. Course Learning Objective:

CLOBJ1	Understand and apply advanced food processing techniques such as extrusion,homogenization, and high-pressure processing.
CLOBJ2	Analyze and assess the factors affecting food quality and safety, including microbial contamination, chemical hazards, and allergens.
CLOBJ3	Understand the principles of food packaging and select appropriate packagingmaterials to extend the shelf life of food products.
CLOBJ4	Consider consumer preferences, market trends, and nutritional requirements in thedevelopment of food products
CLOBJ5	Demonstrate knowledge of labeling requirements, nutritional claims, and foodadditive regulations
CLOBJ6	Apply engineering concepts to optimize food processing operations and improveefficiency.

i. Course Learning Outcomes:

CLO 1	Evaluate the impact of these techniques on food quality, safety, and shelf life.
CLO 2	Evaluate the role of bioactive compounds in food products and their potentialhealth benefits.
CLO 3	Apply principles of innovation in creating and improving food products.

j. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		**Total**
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	
2	**-**		**2**	**20**	**20**		**-**	**60**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

k. Course Content:

Sr. No.	**Content**	**Weightage (%)**	**Teaching Hours**
1	**Unit 1. Compositional, Nutritional and Technological aspects of Meat, Fish and Poultry products** Meat - definition of carcass, Concept of red meat and white meat, Composition of meat, marbling, Post-mortem changes in meat- rigor mortis, tenderization of meat, ageing of meat. Fish - Classification of fish (fresh water and marine), Aquaculture, Composition of fish, Characteristics of fresh fish, Spoilage of fish- microbiological, physiological, biochemical., Poultry Products, Poultry - Structure of hen's egg, Composition and nutritive value, Egg proteins, characteristics of fresh egg, Deterioration of egg quality, Difference between broiler and layers	25	7

2	**Unit 2. Composition and Nutritional aspects of milk and milk products.** 2.1. PFA definition of milk, 2.2.Typical chemical composition of milk of different species e. Buffalo, cow, goat. 2.3.Composition of milk, its constituents, Various steps in processing of An overview of types of market milk and milk products- cheese, paneer, ice cream, ghee, butter,butter oil, flavoured milk, imitation milk. 2.4. An overview of types of market milk and milk products- cheese, paneer, ice cream, ghee, butter, butter oil, flavoured milk, imitation milk.	25	8
3	**Unit 3. Storage by low temperature** 3.1 Freezing- Introduction to refrigeration and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing introduction to thawing, changes during thawing and its effect on food	25	5
4	**Unit 4. Food Preservation & Storage.** 4.1. Drying and Dehydration- Definition, drying as a means of preservation, differences between sun drying and dehydration (i.e. mechanical drying), names of types of driers used in the food industry (Food Irradiation- Introduction, kinds of ionizing radiations used in food irradiation, uses of radiation processingin food industry, Concept of cold sterilization. 4.2. Thermal Processing- Concept of pasteurization, sterilization, commercial sterilization, and blanching	25	10
	Total	**100%**	**30**

Text Book and Reference Book:

1. **Food Science** by N. Potter
2. **Food: Facts and Principles** by N. Shakuntala Manay (Author), M. Shadaksharaswamy(Author)
3. **Srilakshmi B. Dietetics**. New Age International; 2007

6)

a) **Course Name: LAB-II Introduction to Food Technology -II**
b) **Course Code: 11011302DS04**
c) **Prerequisite:** Should be familiar with basic of Introduction to Food Technology.
d) **Rationale:** Acquire knowledge about the Introduction to Food Technology
e) **Course Learning Objective:**

CLOBJ 1	Analyze and comprehend the composition of various food products, includingmacronutrients, micronutrients, and other components.
CLOBJ 2	Gain knowledge about different food processing methods, such aspasteurization, sterilization, drying, fermentation, and extraction.
CLOBJ 3	Develop skills in monitoring and ensuring the quality of food products throughquality control and assurance measures.
CLOBJ 4	Acquire knowledge of food safety principles and regulations, including theidentification and prevention of foodborne illnesses.
CLOBJ 5	Understand the principles and methods of food preservation to extend the shelflife of products while maintaining nutritional quality.
CLOBJ 6	Explore the functionality of different food ingredients and their roles in theformulation and production of food products.

f. Course Learning Outcomes:

CLO 1	Develop proficiency in pipetting, dilution, titrations, and other basic analyticalmethods.
CLO 2	Perform quality control analyses on food products.
CLO 3	Apply statistical methods to analyze sensory data.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
	-	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. List of Experiments:

Sr. No.	**Content**
1	Sensory Evaluation of Food Products.
2	Estimation of pH of different foods.
3	Adulteration Tests for different foods: i. Milk and milkproducts, ii. Tea and coffee etc.

4	Study of shelf life of different foods. (Processed and unprocessed).
5	To study Blanching and methods.
6	Study of pasteurization and sterilization of foods.
7	Identification of different types of packaging materials used in the food industry.

i. Text Book and Reference Book:

1. **Food Analysis** by Shalini Sehgal | IPH
2. **Fruits and vegetable preservation principles and practice** By R P Srivasta

8)

a) Course Name: Food Science
b) Course Code: 11011302DS05
c) Prerequisite: Should be familiar with basic of Food Science.
d) Rationale: Acquire knowledge about the Food Science.
e) Course Learning Objective:

CLOBJ1	Understand the basic principles of chemistry, biology, and physics as they applyto food science.
CLOBJ2	Understand the principles of food engineering and how they contribute to foodproduction and quality
CLOBJ3	Learn the principles of food microbiology and its role in food safety.
CLOBJ4	Learn about food quality assurance programs and their role in maintaining productconsistency and safety.
CLOBJ5	Develop the ability to conduct sensory tests and interpret results.

f. Course Learning Outcomes:

CLO 1	Understand the scope, importance, and interdisciplinary nature of food science.
CLO 2	Identify and analyze the major components of food, including macronutrientsand micronutrients.
CLO 3	Understand food laws, regulations, and standards at national and internationallevels.

f. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
4	-	-	4	20	20		60	-	100

Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

g. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Unit 1. Introduction: food science as a Discipline.** 1.1. Preparation for a Career in Food Science 1.2. Activities offood scientist	20	12
2	**Unit 2. Sugar and related products.** 1.1. Nutritive value and Properties 1.2. Sugar and related products 1.3. Sugar cookery and its role 1.4. Product innovation on confectionary industry	20	12
3	**Unit 3. Evaluation of Food Quality**. 3.1. Sensory evaluation and Sensory test. 3.2. Types of taste. 3.3. Objective evaluation. 3.4. Instruments used for textureevaluation. 3.5. Theory Equipment's and effect on food quality.	20	12
4	**Unit 4. Flesh Foods**. 4.1 Meat- Composition and Nutritive Value. 4.2 Post Mortem changes, aging, tenderizing, curing, meat cookery. 4.3 Poultry- Classification, Processing Composition and nutritive value, Poultry cookery, Preservation, and storage.	20	12
5	**Unit 5. Recent Methods in Preservation**. 5.1. Pulsed Electric field processing, High Pressure Processing, freezing and irradiation. 5.2. Processing using Ultrasound,dielectric, ohmic and infrared heating.	20	12
	Total	**100%**	**60**

Text Book and Reference Book:

1. **Food Science** by N. Potter
2. **Food: Facts and Principles** by N. Shakuntala Manay (Author), M. Shadaksharaswamy (Author)
3. **Srilakshmi B. Dietetics**. New Age International; 2007.
4. **Fruits and vegetable preservation principles and practice** By R P Srivasta

SEMESTER 3

a. **Course Name: IPDC Including History & Culture of India and IKS 2 (VAC 3)**

b. **Course Code: 00019303VA01**

c. **Prerequisite:** IPDC Including History and Culture of India and IKS I

d. **Rationale:** IPDC aims to prepare students for the modern challenges they face in theirdaily lives. Promoting fortitude in the face of failures, Unity amongst family discord, Self-discipline amidst Distractions... and many more priceless lessons. The course focuses on morality and character development at the core of student growth, to enablestudents to become self-aware, sincere, and successful in their many roles as an ambitious student, reliable employee, caring family member, and considerate citizen.

e. **Course Learning Objective:**

f. **Teaching scheme:**

Teaching Scheme				Evaluation Scheme					
				Internal Evaluation			ESE		
L	T	P	C	MSE	CE	P	Theory	P	Total
2	-	-	2	50	50	-	-	-	100

g. **Course Content**

Sr. No.	Content	Weightage (%)	Teaching hours
1	**Remaking Yourself :** Begin with the End in mind Students will learn to visualize their future goals and will structure their lives through smart goals to give themselves direction and ultimately take them to where they want to go.	6	2
2	**Remaking Yourself: Being Addiction Free**		

	Students will explore the detrimental effects of addictions on one's health, personal life, andfamily life. They will learn how to take control of their life by becoming addiction free.	6	2
3	**Selfless Service: Case Study: Disaster Relief** Students will apply previous lessons of seva, to analyse the case study of the Bhuj earthquake relief work.	6	2
4	**Soft Skills: Teamwork & Harmony** Students will learn the six steps of teamwork and harmony that are essential for students' professional and daily life.	6	2
5	**My India My Pride: Present Scenario** To implement the transformation of India from a developing country into a developed country it is necessary to have a value based citizen. Students will see how the transformation to a greater India relies on the vision and efforts of themselves as a youth.	6	2
6	**Learning from Legends: Leading Without Leading** Students will explore a new approach to leadership, through humility.	7	2
7	**My India My Pride: An Ideal Citizen 1** Students will learn that to become value based citizens, they must first develop good values intheir lives. They start by exploring the values of responsibility and integrity.	7	2
8	**My India My Pride: An Ideal Citizen 2** Students will learn that by developing the values of loyalty, sincerity, and punctuality; they become indispensable and can leave a strong impression. They will start developing these values by trying to keep perfection in every small task and by looking at the bigger picture.	7	2
9	**Facing Failures: Timeless Wisdom for Daily Life** Students will learn the role wisdom plays in finding long term stability. They will use ancientwisdom to solve their modern day challenges.	7	2
10	**From House to Home: Forgive & Forget** Students will understand the importance and benefits that forgiveness plays in their personaland professional life. They will learn to apply this knowledge in realistic situations.	7	2
11	**Remaking Yourself: Stress Management** Students will learn to cope with current and future causes of stress.	7	2
12	**Remaking Yourself: Better Health Better Future** A healthy body prevents disease and stress; increases positivity, productivity, and brainpower. Students will learn to maintain good health through regular exercise, healthy eating habits, and regular and sufficient sleep.	7	2

13	**Learning from Legends: Words of Wisdom** A panel of learned and experienced mentors will personally answer practical questions thatstudents face in their daily life.	7	2
14	**Soft Skills: Financial Planning** Students will develop a variety of practical financial skills that prepare them to becomefinancially stable throughout their future careers.	7	2
15	**Remaking Yourself: Impact of Company and Life After IPDC** Students will understand that the type of company that we keep, has a crucial role in determining who we are and who we will become. They will develop the ability to create apositive environment around them. This concluding lecture encourages students to keep practising these priceless lessons and prepares them for the next steps in their lives.	7	2
	Total	**100%**	**30**

a. **Course Name: Advanced English (AEC 3)**

b. **Course Code:** 00019303AE01

c. **Prerequisite:** Basic Knowledge of Commercial Communication and provide students with soft skills that complement their hard skills, making them more marketable when entering the workforce. To inspire students to strive for a higher sense of character by learning from role models who have lived principled, disciplined, and value based lives.

d. **Rationale:** Advanced Communication Skills of English Language.

e. **Course Learning Objective:**

f. **Teaching scheme:**

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
2	**-**	**-**	**2**	**50**	**50**	**-**	**-**	**-**	**100**

g. Course Content

Sr. No.	Content	Weightage (%)	Teaching hours
1	**ABCD**	5	2
2	**Public Speaking** Define Public Speaking Importance of Public speakingTypes of Public speaking Techniques to master public speaking	10	5
3	**Activity Speaking** World's best public speakers (activity based)	5	1
4	**Debate Vs Group Discussion** Define Debate vs GD Importance of debate Techniques to master debate	10	5
5	**Activity Debate** Debate activity	10	2
6	**Vocabulary Building** Advanced vocabulary building Homophones Homonyms Analogies	10	2
7	Reading Comprehension Reading Comprehension	10	5
8	Grammar Error Analysis Para jumble sentence completion confusable sentences Incorrectly spelt words One word substitute Cloze Passages	10	2
9	Report Writing Report Writing	10	2
10	Memo Writing Memo Writing	10	2
11	Narrative Story Writing Narrative Story Writing	10	2
12	Activity Tourism Pitch Activity Tourism Pitch	5	2
	Total	**100%**	**30**

a. Course Name: Wheat milling and baking technology

b. Course Code: 11011303DS01

c. Prerequisite: Should be familiar with basic of Food Chemistry

d. Rationale: Acquire knowledge about the Food Chemistry

e. Course Learning Objective:

CLOBJ 1	Understanding factors that affect taste and odour of food.
CLOBJ 2	Understanding the various techniques to measure texture, colour.
CLOBJ 3	Gaining knowledge about methods of chemistry evaluation

f. Course Learning Outcomes:

CLO 1	Identify and describe the major components of food, including carbohydrates, lipids, proteins, vitamins, minerals, and water
CLO 2	Explain the chemical structures and functions of these components in food.
CLO 3	Understand how chemical reactions contribute to the development of specific tastes and smells

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	**Total**
2	**-**	**0**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage (%)**	**Teaching Hours**
1	Unit 1. Chemistry of Food Flavor1.Philosophy and definition of flavor. 2.Functional characteristic of different food flavor. 3.Flavourmatics/ flavoring compounds. 4.Sensory assessment of flavor. 5.Technology for flavor retention.	25	7
2	Unit 2. Food Additives1.General attributes and classification .2.Buffer system/salt/acids. 3.Chelating agent and sequestrates. 4.Antioxidant.	25	8

	5.Antimicrobial agents. 6.Nonnutritive and low calorie sweeteners. 7.Stabilizer and thickeners.		
3	Unit 3. Food Pigments Heme pigments. Chlorophyll. Carotenoids. Phenolic and flavonoids. Technology for retention of natural colors of food stuff.	25	10
4	Unit 4 .Enzymes In Food Type of enzymes. Role of endogenous enzymes in maturation an ripening. Enzymatic browning- mechanism, methods of regulation control. Application of enzymes in food industry.	25	5
Total		**100%**	**30**

Text Book and Reference Book:

1. **Food chemistry** By Fennama O.R.
2. **Food chemistry** By Mayer L.H.

a. Course Name: LAB -1 Wheat milling and baking technology

b. Course Code: 11011303DS02

c. Prerequisite: Should be familiar with basic of Baking technology

d. Rationale: Acquire knowledge about the baking technology

e. Course Learning Objective:

CLOBJ 1	Analyze and comprehend the composition of various food products, includingmacronutrients, micronutrients, and other components.
CLOBJ 2	Gain knowledge about different food processing methods, such as pasteurization, sterilization, drying, fermentation, and extraction.
CLOBJ 3	Develop skills in monitoring and ensuring the quality of food products throughquality control and assurance measures.
CLOBJ 4	Acquire knowledge of food safety principles and regulations, including theidentification and prevention of foodborne illnesses.
CLOBJ 5	Understand the principles and methods of food preservation to extend the shelflife of products while maintaining nutritional quality.

f. Course Learning Outcomes:

CLO 1	Quality testing of grains and flour.
CLO 2	Hands-on experience with baking processes and equipment.
CLO 3	Conducting and interpreting quality tests for grains, flour, dough, and baked goods.
CLO4	Evaluating the quality of baked goods based on texture, flavor, appearance, and other sensory attributes.
CLO5	Developing new baking formulations and optimizing existing ones.

g. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
				Internal Evaluation			ESE		Total
L	T	P	C	MSE	CE	P	Theory	P	
	-	4	2	-	-	20	-	30	50

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content
1	Classification of wheat based on Physico-chemical properties.
2	Study of Conditioning of wheat.
3	Study of Milling of wheat.
4	Study of Flour colour grade value and ash content Flour particle size distribution.
5	Study of Sieve analysis of the flour.
6	Study of Quality Testing of flour a) - Falling number and amylase activity. b) - Sedimentation value. c) Pelshenke value. d) Rheological Tests. i) Farinograph. ii) Mixograph iii) Extensiograph. iv) Alveograph
7	Determining the gluten content, SDS sedimentation volume test, Falling number test.
8	Manufacture of bread, study of shelf life bread, quality of bread.
9	Test Baking: biscuits, cookies, crackers, buns
10	Visit to wheat Milling industry .

Text Book and Reference Book:

1. **Laboratory Manual of Food Analysis** By Shalini Sehgal
2. **Backery Science and Cereal Technology** By Neelam Khetar Paul; Raj Bala Grewal; Sudesh Jood
3. **Textbook of Bakery and Confectionery** By Yogambal Ashokkumar
4. **Food analysis laboratory manual** By S. Suzanne Nielsen

a. Course Name: Food Processing Equipment

b. Course Code: 11011303DS03

c. Prerequisite: Should be familiar with basic of Food Chemistry

d. Rationale: Acquire knowledge about the Food Chemistry

e. Course Learning Objective:

CLOBJ 1	Understanding factors that affect taste and odour of food.
CLOBJ 2	Understanding the various techniques to measure physical parameters
CLOBJ 3	Gaining knowledge about methods of equipment evaluation
CLOBJ 4	Understanding the various techniques to measure
CLOBJ 5	Gaining knowledge about methods of equipment design

f. Course Learning Outcomes:

CLO 1	Understand the principles of food processing operations.
CLO 2	Elaborate engineering operations that are critical to the food processing operations and industrial growth.
CLO 3	Identify the factors affecting unit operations
CLO 4	Identify the suitable unit operations Process for a specific purpose.
CLO 5	Design basic food processing systems and select suitable equipment to meet processing requirements.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	**Total**
2	**-**	**0**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	Unit 1: Material HandlingMaterial handling machines: Conveyor, elevators etc	8	3
2	Unit 2: Pretreatment Unit Operations Cleaning, Dehulling and Dehusking, Sorting & Grading 2. Peeling and Forming, Size reduction and separation, Agitation and Mixing	15	4
3	Unit 3: Engineering properties of Food materials Its significance in equipment design, processing and handling of food products 2. Hygienic design of Food processing equipment. Sanitary requirement, Sanitary pipes and fittings	12	5
4	Unit 4: Rheology of Food Materials1. Concept of rheology, elastic, plastic and viscous behavior, 2. methods of texture evaluation, a) subjective and objective measurements	15	4
5	Unit 5: Evaporation Principles of Evaporation, Types and selection of Evaporators, a) Mass and Energy balance . b) Design of single and multiple effect evaporators c) recompression heat and mass recovery and vacuum creating devices.	20	6
6	Unit 6: Drying Principles of drying, a) Drying equipment. Different types of Dryers and components - Roller, Spray, Tray, Fluidized bed etc.	15	4
7	Unit 7: Thermal Processing Sterilization, Pasteurization blanching -principles, different methods and equipment's. Application of thermal processing in food industry.	15	4
Total		**100%**	**30**

Text Book and Reference Book:

1. **Handbook of Food Processing**
   Equipment By George Saravocos &
   Athanasios E. Kostaropoulos
2. **Food Processing Handbook** By James G. Brennan
3. **Food Science** By Norman N. Potter; Joseph H. Hotchkiss 4. Foods: Facts and Principles By N. Shakuntala Manoy; M. Shadaksharaswamy

a. Course Name: LAB-II Food Processing Equipment

b. Course Code: 11011303DS04

c. Prerequisite: Should be familiar with basic of processing technology

d. Rationale: Acquire knowledge about the food processing technology

e. Course Learning Objective:

CLOBJ 1	Analyze and comprehend the composition of various food products, includingmacronutrients, micronutrients, and other components.
CLOBJ 2	Gain knowledge about different food processing methods, suchas pasteurization, sterilization, drying, fermentation, and extraction.
CLOBJ 3	Develop skills in monitoring and ensuring the quality of food products throughquality control and assurance measures.
CLOBJ 4	Acquire knowledge of food safety principles and regulations, including theidentification and prevention of foodborne illnesses.
CLOBJ 5	Understand the principles and methods of food preservation to extend the shelflife of products while maintaining nutritional quality.

f. Course Learning Outcomes:

CLO 1	Ability to select and design appropriate equipment for specific food processing applications.
CLO 2	Knowledge of safety and sanitation standards in food processing operations.
CLO 3	Understanding of energy efficiency practices and sustainability in food processing.
CLO4	Identifying and implementing safety procedures associated with food processing equipment
CLO5	Operating equipment used for various food processing techniques such as mixing, grinding, heating, cooling, and packaging.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		**Total**
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	
	-	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content
1	Studies on the sorting and grading of food materials.
2	Study of centrifugal separators process.
3	Study of mixing equipment's
4	Study of evaporator, dryer, sterilizer, equipment's
5	Study of spry dryers
6	Study Microwave oven.
7	Study of Retort Sterilization Equipment.
8	Study of Boiler
9	Study of canning line equipment's
10	. Study of milling equipment's

Text Book and Reference Book:

1. **Laboratory Manual of Food Analysis** By Shalini Sehgal
2. **Foods: Facts and Principles** By N. Shakuntala Manoy; M. Shadaksharaswamy
3. **Food processing technology: principles and practice** By P. J. Fellows
4 **Practical hand book of food and nutrition** By Jayashree Mishra, Prabati Guru

a. Course Name: Normal Nutrition
b. Course Code: 11011303DS05
c. Prerequisite: Should be familiar with basic of Normal Nutruition
d. Rationale: Acquire knowledge about the Normal Nutruition
e. Course Learning Objective:

CLOBJ1	Understand the basic principles of chemistry, biology, and physics as they applyto food science.
CLOBJ2	Understand the principles of food engineering and how they contribute to foodproduction and quality
CLOBJ3	Learn the principles of food microbiology and its role in food safety.
CLOBJ4	Learn about food quality assurance programs and their role in maintaining productconsistency and safety.
CLOBJ5	Develop the ability to conduct sensory tests and interpret results.

f. Course Learning Outcomes:

CLO 1	Understand on the physiological and metabolic functions of nutrients.
CLO 2	Gain in-depth knowledge of the physiological and metabolic role of macronutrients, fat soluble and water soluble vitamins, electrolytes and their importance in human nutrition.
CLO 3	Acquire basic knowledge of food groups, food exchange system and their nutritional significance, and application of knowledge acquired for healthy eating.
CLO 4	Discuss the nutritional requirements and dietary considerations for different stages of life, including pregnancy, infancy, childhood, adolescence, adulthood, and old age.
CLO 5	Understand the impact of nutrition on immune function and overall health.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
4	**-**	**-**	**4**	**20**	**20**		**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weighage (%)	Teaching Hours
1	**Unit:1** Basic Concepts Concepts and content of nutrition: Nutrition agencies; Nutrition of community; Nutritional policies and their implementation; metabolic function of nutrients	10	12
2	**Unit:2** Introduction of nutrients Nutrients: Sources, functions, digestion, absorption, assimilation and transport of carbohydrates, proteins and fats in human beings;	25	12
3	**Unit:3** Functions of nutrients . Water and energy balance: Water intake and losses; Basal metabolism- BMR; Body surface area and factors affecting BMR	25	12
4	**Unit:4** Diet and Disorders. Formulation of diets: Classification of balanced diet; Preparation of balanced diet for various groups; Diets and disorders Recommended dietary allowances; For various age group; According physiological status; Athletic and sports man; Geriatric persons	30	12
5	**Unit:5** Malnutrition:Type of Malnutrition ; Multi-factorial causes & Recovery. Nutritional Education and policies. Epidemiology of under nutrition and over nutrition. Nutrition infection and immunity; Nutrition education.	10	12
	Total	**100%**	**60**

i. Text Book and Reference Book:

1. **Food Science** by N. Potter
2. **Food: Facts and Principles** by N. Shakuntala Manay (Author), M. Shadaksharaswamy(Author)
3. Srilakshmi B. **Dietetics**. New Age International; 2007

SEMESTER 4

a. **Course Name: Advanced English-I**
b. **Course Code: 00019303AE01**
c. **Prerequisite:** Advanced Communication Skills of English Language.
d. **Rationale:** Advanced Communication Skills of English Language.
e. **Course Learning Objective:**

CLOBJ 1	Identity and develop soft skills required for personal and professional growth.
CLOBJ 2	Develop professional etiquette & desired behaviour at the workplace
CLOBJ 3	Speak and participate effectively in oral organizational communication
CLOBJ 4	Improve comprehensive skills for reading
CLOBJ 5	Know how to be assertive in professional environment.

f. **Course Learning Outcomes:**

CLO 1	Develop advanced communication skills.
CLO 2	Become more proficient in formal writing.
CLO 3	Apply interpersonal communication skills to be more productive at the workplace.
CLO 4	Identify, set and achieve the goals with the help of public speaking.
CLO 5	Use wide range of vocabulary to communicate effectively.

g. **Teaching & Examination Scheme:**

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	**Total**
2	**-**	**0**	**2**			**-**		**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Corporate Etiquettes** 1. Tips and guide to develop personality and gain various etiquettes manners, case studies and activities. 2. Telephone etiquettes	3	1
2	**Etiquette for foreign business trips**	3	1
3	**Etiquette for small talks**	3	1
4	**Respecting privacy** Learning to say 'No'	3	1
5	**Presentation Skills** Introduction to Presentation Skills and Audience Analysis Planning and Structuring Your Presentation Visual Aids, Body Language, and Non-Verbal Communication Voice Control, Delivery, and Overcoming Nervousness Engaging Your Audience and Handling Questions	33	10
6	**Email etiquettes & Writing**	7	2
7	Article writing	7	2
8	Poster making	7	2
9	Advertisement designing	7	2
10	Convincing skills	7	2
11	Insane inventor	7	2
12	Picture perception	4	1
13	Book review	3	1
14	Movie review	3	1
15	Critical thinking	3	1
Total		**100 %**	**30**

i. **Text Book and Reference Book:**

1. **Business Correspondence and Report Writing** SHARMA, R. AND MOHAN, K.By SHARMA, R. AND MOHAN, K.
2. **Communication Skills** 2011 By Kumar S and Lata P | Oxford University Press
3. **Practical English Usage** By MICHAEL SWAN
4. **A Remedial English Grammar for Foreign Student** By F.T. WOOD
5. **On Writing Well** By William Zinsser | Harper Paperbacks,2006 | 30th anniversary edition
6. **Oxford Practice Grammar**, By John Eastwood | Oxford University Press

a. **Course Name: Basic German-I**

b. **Course Code: 00019303AE02**

c. **Prerequisite:** German is the second most commonly used scientific language. Germany is the third largest contributor to research and development and offers research fellowships to scientists from abroad. Germany awards a generous number of scholarships and other support to study in Germany. Working holiday visas are available for young people from a range country, and special visas are offered to skilled workers and professionals.

d. **Rationale:** There are agreements for student exchange between Germany and many countries of the world. Knowing the language of your German business partners improves your relations and therefore your chances for effective communication and success.

e. **Course Learning Objective:**

CLOBJ 1	Communicate, understand various City Places, Body Parts, Professions. Can also able to frame the Sentences with the help of Modal Verbs.
CLOBJ 2	Develop professional etiquette & desired behaviour at the workplace
CLOBJ 3	Speak and participate effectively in oral organizational communication
CLOBJ 4	Improve comprehensive skills for reading.
CLOBJ 5	Know how to be assertive in professional environment.

f. **Course Learning Outcomes:**

CLO 1	There are agreements for student exchange between Germany and many countries of the world. Knowing the language of your German business partners improves your relations and therefore your chances for effective communication and success.
CLO 2	Can communicate in German with Friends and in shopping mall and also able ask and guide Directions in German Language.
CLO 3	Can read basic Passages in German
CLO 4	Write basic topics in German

g. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
2	-	0	2			-		-	100

M- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Grammar and Vocabulary** Körperteile (Body Parts) Beruf (Professions) Konjunktion (Conjunctions) Modal Verb Zeitformen (Tenses) Briefeschreiben (Letter writing)	33	10
2	**Speaking skills** Dialogue Sprechen (Suggested Situation) Richtungen (Asking Directions) Conversation between two People Conversation in shopping mall/Shop	20	6
3	**Reading Skills** Lebenslauf (Daily activities) Kurzgeschichten (Short stories)	20	6
4	**Listening Skills** Objekt (Objects) Audio Übung (audio exercises) Conversation identification	27	8
Total		**100 %**	**30**

Text Book and Reference Book:

1. By Stefanie Dengler, Paul Rusch | Klett- Langenscheidt
2. Studio D
3. By Hermann Funk| Cornelsen
4. The Everything Essential German Book
5. By Edward Swick | Adams Media

a. **Course Name: Basic French-I**
b. **Course Code: 00019303AE03**
c. **Prerequisite:** Basic Communication Skills of French Language.
d. **Rationale:** Basic Communication Skills of French Language.
e. **Course Learning Objective:**

CLOBJ 1	Talk about future activities and plans.
CLOBJ 2	Ask and respond to questions in French.
CLOBJ 3	Describe feelings in French.
CLOBJ 4	Talk about likes and dislikes.

f. **Course Learning Outcomes:**

CLO 1	Recognize and use essential vocabulary and basic grammatical structures in French.
CLO 2	Talk about future activities and plans.
CLO 3	Ask and respond to questions in French.
CLO 4	Describe feelings in French.

g. **Teaching & Examination Scheme:**

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		
L	**T**	**P**	**C**	**MSE**	**CE**	**P**	**Theory**	**P**	**Total**
2	**-**	**0**	**2**			**-**		**-**	**100**

N- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. **Course Content:**

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Grammar** Articles (definite, indefinite and partitive)\ repositions (à, en, au, aux, à la, à l', chez, du, de la, des, d') Les verbs (Present Tense) : ir, re, irregular verbs Le futur Proche Poser et Répondez aux questions (Asking Questions) – Qui, Quand, Où, Pourquoi, Quel, Quelle, Quels, Quelles	33	10
2	**Listening Skills** Class room objects Study Subjects Common nouns of places Seasons	17	5
3	**Speaking Skills** Talking to a French Speaking Stranger Talking about hobbies Talking and writing about hobbies	17	5
4	**Reading Skills and Writing Skills** My family (Ma famille) Les dialogues (Talking to a classmate on the 1st day of school/college. / Talking to a friend about your family or vice versa. / Talking and writing about hobbies. / Talking to a French Speaking Stranger.) My hobbies (Mes loisirs) My Best friend (Mon meilleure ami)	33	10
Total		**100 %**	**30**

Text Book and Reference Book:

1. By Marie-Noelle Cocton | Didier
2. Enchanté 0
3. By Ms. Archana Khurana | Rachna Sagar
4. Larrouse Dictionnaire de Poche
5. Larousse French Grammar (Mini) by Paperback
6. Larousse French Grammar (Mini)
7. Paperback
8. Plaisir D'ecrire by
9. By Viral Thakkar | Saraswati House Pvt. Ltd.

a. Course Name: Food Industry Management

b. Course Code: 11011304SE01

c. Prerequisite: Basic management knowledge

d. Rationale: Basic management skills

e. Course Learning Objective:

CLOBJ 1	Understand the structure, dynamics, and significance of the food industry in global and local markets.
CLOBJ 2	Analyze key operational and managerial practices in food processing, manufacturing, and distribution.
CLOBJ 3	Develop knowledge of quality assurance, food safety standards, and regulatory compliance.
CLOBJ 4	Explore sustainable practices and emerging technologies in food industry management.
CLOBJ 5	Apply strategic management principles to solve real-world challenges in the food industry.

f. Course Learning Outcomes:

CLO 1	Recognize and use essential vocabulary and basic grammatical structures in French.
CLO 2	Talk about future activities and plans.
CLO 3	Ask and respond to questions in French.
CLO 4	Describe feelings in French.
CLO5	Talk about likes and dislikes.

g. Teaching & Examination Scheme:

Teaching Scheme	Evaluation

				Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
2	-	0	2			-		-	100

O- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Introduction to Food Industry** • Overview of the food industry: Global and Indian context • Structure of food supply chains • Current trends and challenges • Importance of innovation and technology	20	6
2	**Operations in the Food Industry** • Food processing and manufacturing systems • Logistics and distribution management • Inventory and warehouse management • Role of automation and IoT in food operations	20	6
3	**Food Safety and Quality Management** • Food quality standards: ISO, HACCP, FSSAI • Food safety regulations and audits • Risk management in food production • Packaging and labeling requirements	20	6
4	**Marketing and Consumer Behavior** • Market research in the food industry • Consumer trends and preferences • Branding and marketing strategies • E-commerce and retail in food sales	20	6
5	**Sustainability and Emerging Trends** • Environmental impact and waste management • Role of circular economy in food production • Sustainable sourcing and ethical practices • Emerging trends: Plant-based foods, lab-grown meat, etc.	20	6
Total		**100 %**	**30**

Text Book and Reference Book:

1. **Food Processing Technology: Principles and Practice** by P.J. Fellows
2. **Introduction to Food Engineering** by R. Paul Singh and Dennis R. Heldman
3. **Food Industry Wastes: Assessment and Recuperation of Commodities** by Maria Kosseva and Colin Webb
4. **The Food Industry Innovation School** by Helmut Traitler, Brian Berkowitz, and Dieter Seitz
5. **Sustainability in the Food Industry** by Cheryl J. Baldwin
6. **Handbook of Food Factory Design** by Christopher G. Jablonski

a. **Course Name: Foundations of Yoga**
b. **Course Code: 00019404VA01**
c. **Prerequisite:** An open mind, basic health, consistency, a quiet space, comfortable clothing, a yoga mat, proper guidance, and a willingness to connect with your body, breath, and mind.
d. **Rationale:** The foundation of yoga promotes physical flexibility, mental clarity, emotional resilience, and spiritual growth, fostering a holistic approach to well-being that enhances overall health and encourages a deeper connection between mind, body, and spirit.

e. **Course Learning Objective:**

CLOBJ 1	Understand the structure, dynamics, and significance of the food industry in global and local markets.
CLOBJ 2	Analyze key operational and managerial practices in food processing, manufacturing, and distribution.
CLOBJ 3	Develop knowledge of quality assurance, food safety standards, and regulatory compliance.
CLOBJ 4	Explore sustainable practices and emerging technologies in food industry management.

f. **Course Learning Outcomes:**

CLO 1	To introduce students to the basic principles and philosophy of yoga.
CLO 2	To provide an understanding of the physical and mental benefits of yoga.
CLO 3	To teach foundational yoga postures, breathing techniques, and meditation practices.
CLO 4	To cultivate a personal yoga practice that promotes well-being and stress management.

g. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
1	-	2	2		20	20	20	20	100

P- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Introduction to Yoga:** Definition and History of Yoga Different Paths of Yoga (Hatha, Raja, Karma, Bhakti, Jnana) Importance and relevance of Yoga in modern life	20	3
2	**Philosophy of Yoga:** The Eight Limbs of Yoga (Ashtanga Yoga) Basic concepts of Patanjali's Yoga Sutras Concept of Mind, Body, and Spirit connection	15	2
3	**Understanding the Musculoskeletal System** Respiratory and Circulatory Systems in relation to Yoga Physiological and Anatomical Effects of Asanas on the Human Body	20	3
4	**Introduction to Pranayama and Meditation:** Basics of Pranayama (Breathing Techniques) Introduction to Meditation: Importance and Benefits Techniques for Developing Concentration and Mindfulness	20	3
5	**Shat chakras**	5	1
6	**Yoga and Health:** Physical and Mental Health Benefits of Yoga Yoga for Stress Management Yoga and Lifestyle Diseases (e.g., Hypertension, Diabetes)	20	3
Total		**100 %**	**30**

List of Experiments:

Exp. No.	Name of the Experiment
1	**Warm-up and Preparation:** • Basic Warm-up Exercises • Joint Mobilization and Stretching
2	**Foundational Yoga Postures:** • Standing Postures: Tadasana, Ardhakatichakrasana, Ardhachakrasana,Padahastasana, Trikonasana and Vrikshasana step bystep with Sthiti, main procedure, and vishrama. • Sitting Postures: Vajrasana, Suptavajrasana, Shashankasana, Ushtrasana,Marjarasana,Pashchimottanasana, Bhadrasana, Swasthikasana, Siddhasana,Padmasana, Gomukhasana and Ardhamatsyendrasana step by step with Sthiti, main procedure,and vishrama. • Supine Postures: Shavasana, Pavanamuktasana, Sarvangasana, Matsyasana, Halasana, Chakrasana and Setubandhasana step by step with Sthiti, main procedure and visrama • Prone Postures: Bhujangasana, Shalabhasana, Dhanurasana, and Makarasana step by step with Sthiti, main procedure and vishrama. • Introduction to Sun Salutations (Surya Namaskar)
3	**Pranayama Techniques:** • Perform Kumbhakabhedas namely-Suryabhedana, Ujjayi, Sitkari, Sheetali, Bhastrika and Bhramari. • Perform Nadishuddhi Pranayama with inhalation-retention-exhalation in the ratio of 1:4:2 in a comfortable sitting posture.
4	**Shuddhikriya Techniques:** • Perform Jalaneti, Kapalabhati and Trataka.
5	**Meditation and Relaxation Techniques:** • Guided Meditation for Beginners • Techniques for Relaxation: Yoga Nidra • Mindfulness Meditation Practice • Breath Awareness Meditation
6	**Mudras and Bandhas:**

Text Book and Reference Book:

1. **A Text book of Sports and Exercise Physiology** By Dey, Swapan Kumar | Jaypee Brothers Medical publishers
2. **Competition Level Book of Sports and Games** By Dr. A. Mahaboojan, and etal | Lakshya Publisher and Distributor
3**. Exercise, Physiology, Fitness and sports Nutrition** By B. Srilakshmi,V.Suganthi and G. Kalaivani Ashok | New AgeInternational Publisher
4**. Health and Physical Education** By Puri & Chandra S S | Surjeet Publications
5. **Rules of Games and Sports, Updated Version 2024** By Shrivastava, Singh and Kumar | KSK Publishers and Distributors, Delhi
6. **Sports Nutrition and Weight Management** By Prof. V. Satyanarayana | Sports Publications, Delhi
7. **Swasthya Shiksha** By Dixit, Suresh | Sports Publications, Delhi
8. **Principles and History of Physical Education** By Kamlesh, M.L | New Delhi: Friends Publication
9. **Light on Yoga (TextBook)** By B.K.S. Iyengar
10. **The Yoga Sutras of Patanjali** (TextBook) By Swami Satchidananda
11**. The Heart of Yoga** (TextBook) By T.K.V. Desikachar
12. **Yoga Anatomy** (TextBook) By Leslie Kaminoff and Amy Matthews

a. **Course Name: Physical Education and Sports**
b. **Course Code: 00019404VA02**
c. **Prerequisite:** Basic understanding of physical fitness concepts and a willingness to actively participate in physical activities and team-based sports.
d. **Rationale:** The objective of this course is promoting physical health, enhancing mental well-being, fostering social skills, and encouraging lifelong habits of fitness and teamwork, ultimately contributing to holistic personal development and community cohesion.

e. **Course Learning Objective:**

CLOBJ 1	Understand the structure, dynamics, and significance of the food industry in global and local markets.
CLOBJ 2	Analyze key operational and managerial practices in food processing, manufacturing, and distribution.
CLOBJ 3	Develop knowledge of quality assurance, food safety standards, and regulatory compliance.
CLOBJ 4	Explore sustainable practices and emerging technologies in food industry management.

f. **Course Learning Outcomes:**

CLO 1	.Learning of New Skills in Games and Sports.
CLO 2	Develop healthy life style practices.
CLO 3	Acquire Knowledge of well- being and physical fitness.
CLO 4	Maintain physical fitness through sports.
CLO 5	Improve skills of critical thinking, creative-thinking, problem-solving, team-work leadership, cooperative
CLO 6	Behaviour and technical competencies.
CLO 7	Acquire information of sports initiatives of the Government.

g. **Teaching & Examination Scheme:**

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
1	**-**	**2**	**-**		**20**	**20**	**20**	**40**	**100**

Q- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**History and Basic Concept of Sports and Fitness:** Concept of Sports and Fitness Aims and Objectives,Importance of Sports and Fitness Difference between Games and Sports History of Sports Ancient and Modern Olympics Asian Games and Common Wealth Gamesfunctioning	33	5
2	**Concepts of Physical Fitness and Rules and Techniques of Games:Concepts of Physical Fitness** Fitness Components Meaning and development of strength, speed and accuracy in different physical activities Sports Nutrition Importance of a Balanced Diet **Rules and Techniques(games like Football, Athletics,** Kho Kho, Kabaddi, Hockey etc.) Basic concepts and rules of different sports Fundamental Skills of Games and Sports	34	5
3	**Trends in Sports and Fitness:** Personality Development through Sports Team building through Group games General Sports Policies Role of Khel Mahakumbh in Gujarat to promote Sports Careers in Physical Education and Sports	33	5
Total		**100 %**	**15**

List of Experiments:

Exp. No.	Name of the Experiment
1	**Fundamental Skill Development Activities:** Marking fields or courts on ground, Group Games or Relay Race, Outdoor Games, Fundamental Skill Development Activities: • Practicing general warm-up, stretching • Practicing cardio and respiratory fitness • Walking, Skipping and Running Participate and match practice in Game and Sports.

Text Book and Reference Book:

1. **A Text book of Sports and Exercise Physiology** By Dey, Swapan Kumar | Jaypee Brothers Medical publishers
2. **Competition Level Book of Sports and Games** By Dr. A. Mahaboojan, and etal | Lakshya Publisher and Distributor
3. **Exercise, Physiology, Fitness and sports Nutrition** By B. Srilakshmi,V.Suganthi and G. Kalaivani Ashok | New Age International Publisher
4. **Health and Physical Education** By Puri & Chandra S S | Surjeet Publications
5. **Rules of Games and Sports, Updated Version 2024** By Shrivastava, Singh and Kumar | KSK Publishers and Distributors, Delhi
6. **Sports Nutrition and Weight Management** By Prof. V. Satyanarayana | Sports Publications, Delhi
7. **Swasthya Shiksha** By Dixit, Suresh | Sports Publications, Delhi
8. **Principles and History of Physical Education** By Kamlesh, M.L | New Delhi: Friends Publication

a. **Course Name: National Cadet Corps (NCC)**
b. **Course Code: 00019404VA03**
c. **Prerequisite:** Student who opt for this course should be physically fit and free from any major ailment
d. **Rationale:** The objective of the NCC as a value-added course is to develop character, comradeship, secular outlook, discipline, leadership, and a spirit of adventure among youth.

e. Course Learning Objective:

CLOBJ 1	Understand the structure, dynamics, and significance of the food industry in global and local markets.
CLOBJ 2	Analyze key operational and managerial practices in food processing, manufacturing, and distribution.
CLOBJ 3	Develop knowledge of quality assurance, food safety standards, and regulatory compliance.
CLOBJ 4	Explore sustainable practices and emerging technologies in food industry management.

f. Course Learning Outcomes:

CLO 1	Demonstrate the ability to work effectively in teams with mutual respect, fostering camaraderie and teamwork.
CLO 2	Exhibit self-discipline and adhere to established rules and regulations in various activities, promoting an organized and disciplined approach.
CLO 3	Develop leadership qualities, including decision-making, problem-solving, and the ability to inspire and motivate others.
CLO 4	Understand and respect diverse cultures and religions, promoting unity, harmony, and a secular outlook in all interactions.
CLO 5	Engage in activities that enhance physical fitness, environmental awareness, and resilience, fostering a spirit of adventure and sustainable living.
CLO 6	Actively participate in community service initiatives, demonstrating social responsibility, empathy, and a commitment to societal well-being.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
1	**-**	**2**	**-**		**20**	**20**	**20**	**40**	**100**

R- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage (%)**	**Teaching Hours**
1	**Introduction to NCC:** History and significance of NCC, Organizational structure and functioning	14	2

2	**Leadership and Personality Development:** Leadership qualities and styles, Communication skills, Team building and management	16	3
3	**National Integration and Awareness :** Importance of national integration, Cultural diversity and unity	14	2
4	**Health and Hygiene:** Basic health and hygiene practices, First aid and emergency response	14	2
5	**Environmental Awareness:** Conservation and sustainable practices, Role of NCC in environmental protection	14	2
6	**Disaster Management**: Types of disasters and their impact, Preparedness and response strategies	14	2
7	**Social Service and Community Development**:Role of NCC in community service, Planning and executing social service activities	14	2
Total		**100 %**	**15**

List of Experiments:

Exp. No.	Name of the Experiment
1	**Drill:** Basic drill movements, Marching and parade techniques
2	**Physical Fitness:** Physical training exercises, Endurance, strength building, and Yogasana
3	**Community Service Projects:** Participation in local community service projects, Planning and execution of social activities

Text Book and Reference Book:

1. **Cadet's Hand Book Common Subject**, All Wings (in English
DGNCC, New Delhi
2. **Cadet's Hand Book Common Subject**, All Wings (in Hindi)
DGNCC, New Delhi)
3. **Cadet's Hand Book Specialized Subject**, All Wings
DGNCC, New Delhi

a. **Course Name: Post-Harvest Technology**
b. **Course Code: 11011304DS01**
c. **Prerequisite:** Should be familiar with basic of post harvesting technology
d. **Rationale:** Acquire knowledge about the post harvesting technology

e. **Course Learning Objective:**

CLOBJ 1	Provide an overview of the structure, composition, and value of post harvesting
CLOBJ 2	Gain Knowledge of the growth of the Indian Food Processing industry.
CLOBJ 3	Understanding different food processes concepts.

f. **Course Learning Outcomes:**

CLO 1	Understanding the importance of the scope of fresh produce industries
CLO 2	Understanding the postharvest losses and technologies to overcome.
CLO 3	Implementation of the new recent developed technologies for transportation and storage of the fruits and vegetables.

g. **Teaching & Examination Scheme:**

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
4	**-**	**0**	**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Unit 1: Fruits and vegetable scenario.** Production and processing of fruits and vegetables, Scope of the fruits and vegetable industries. Principles of Post Harvest Technology	30	18
2	**Unit 2: Post Harvest Physiology and Biochemistry of Fruits and Vegetables** Introduction, Structure and composition of fruits and vegetables. Maturity and ripening processes and factors affecting them. Presence of constituents viz, carbohydrates, acid, lipids, amino acid, colouring and flavouring compounds, vitamin, bitter and astringent principles and their changes during development; maturation and ripening of fruits and vegetables; Physiology and Biochemical changes after harvest; Respiration and ripening, Biosynthesis of ethylene and its regulation, Ethylene action and ripening processes	20	12
3	**Unit 3: Post Harvest technologies of fresh produce** Harvesting and Handling, Storage Management, Preventing Moisture Losses, Sanitation for Maintaining Quality Ethylene for Ripening Post-harvest Physiological Disorders. Effect on the Quality of Fruits and Vegetables of Delayed Cooling, Packaging	20	12
4	**Unit 4: Post-harvest losses and control Measures** Harvesting of Fruits and Vegetables, Maturity for Harvesting, Pre-treatment, Heat Treatment Methods. Packaging requirement of fresh produces.	20	12
5	**Unit 5: Storage and Transportation of the fresh produce** Supply chain management, cold chain. Transportation of fruits and vegetables	10	6
Total		**100 %**	**30**

Text Book and Reference Book:

1. **Post harvest Management and Processing of Fruits and Vegetables** By Rathore N S
2. **Postharvest Management and Processing of Fruits and Vegetables**. By Sharma and Sathish K

a. **Course Name: Spice and Flavour Technology**
b. **Course Code: 11011304DS02**
c. **Prerequisite:** Should be familiar with basic of spice technology
d. **Rationale:** Acquire knowledge about the spice technology

e. **Course Learning Objective:**

CLOBJ 1	Provide an overview of the structure, composition, and chemistry of spice
CLOBJ 2	Gain Knowledge of the growth of the spice technology in Indian Food Processing industry.
CLOBJ 3	Understanding different food processes concepts and uses.

f. **Course Learning Outcomes:**

CLO 1	Discuss scope, processing and production of spices and plantation crops.
CLO 2	Know about processing methods for value addition of spices and condiments.
CLO 3	Discuss standards, adulteration and packaging of spices and condiments.

g. **Teaching & Examination Scheme:**

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
2	**-**	**0**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Unit 1: Spices Production and Processing:** Production and processing scenario of spice,lavour & plantation crops and its scope Standards specification of spices and flavours	30	8
2	Unit 2: Major SpicesPost Harvest Technology composition, processed products of following spices Ginger Chill Turmeric Onion and garlic Pepper Cardamom Cashew nut, coco nut.	20	6
3	**Unit 3: Minor Spices** Herbs and leafy vegetables processing and utilization, All spice, Annie seed, sweet Basil, Caraway seed, Cassia, Cinnamon, Clove, Coriander, cumin, Dill seed Fern seed nutmeg mint marjoram, Rose merry, saffron, sage	20	6
4	**Unit 4: Processing Quality Control** Tea, Coffee, Cocoa: Processing quality control Vanilla and annatto-processing Spice oil and oleoresins Packaging of spices and spice products	20	6
5	**Unit 5: Flavours** Separation, purification and identification of natural flavouringMaterialsSynthetic flavouring agents and their stability Flavours of soft drinks, Baking and confectionery industry	10	4
Total		**100 %**	**30**

Text Book and Reference Book:

1. **Handbook of Spices, Seasonings and Flavorings** By Susheela Raghavan Uhl
2. **Food chemistry** By Mayer L.H.

LAB -1

a. Course Name: LAB-I Spice and Flavour Technology

b. Course Code: 11011304DS03

c. Prerequisite: Should be familiar with basic of spice technology

d. Rationale: Acquire knowledge about the spice technology

e. Course Learning Objective:

CLOBJ1	Stabilize farm prices and income: It stabilizes farm price by utilizing the excessproduce in value addition to provide additional income to the farmers.
CLOBJ2	Add variety to the diet: Value addition/processing make the food more attractiveand palatable
CLOBJ3	Learn foreign exchange through export of spice products.

f. Course Learning Outcomes:

CLO 1	Discuss scope, processing and production of spices and plantation crops
CLO 2	Know about processing methods for value addition of spices and condiments
CLO 3	Discuss standards, adulteration and packaging of spices and condiments

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		**Total**
L	**T**	**P**	**C**	**T**	**CE**	**P**	**T**	**P**	
-	**-**	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

Exp. No.	**Name of the Experiment**
1	Identification and characterization of flavoring compounds of Spices.
2	Study of Oil determination by Soxhlet Apparatus
3	Extraction of oleoresins-Turmeric, ginger, pepper, clove

4	Study of Steam distillation of Spices and Condiments for essential oils extraction (isolation of aroma compounds)
5	Determination of curcumin content in turmeric
6	Packaging study of spices
7	Preparation of curry powder
8	Preparation of Indian Masala for different foods
9	Visit to spice industry
10	Chemical analysis of spices moisture, Volatile oil, specific gravity, refractive index, acid value

h. Text Book and Reference Book:

Food Analysis By Shalini Sehgal

a. Course Name: Processing of Milk and Milk Products

b. Course Code: 11011304DS04

c. Prerequisite: Should be familiar with basic of milk technology

d. Rationale: Acquire knowledge about the milk technology

e. Course Learning Objective:

CLOBJ 1	Provide an overview of the structure, composition, and food chemistry of dairy product
CLOBJ 2	Gain Knowledge of the growth of the dairy technology in Indian Food Processing industry.
CLOBJ 3	Understanding different dairy food processes concepts and uses.

f. Course Learning Outcomes:

CLO 1	Different Composition and types of of milk and milk products. .
CLO 2	understand the technology of various frozen milk products.
CLO 3	Discuss the various milk processing methods.

g. Teaching & Examination Scheme:

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
2	-	0	2	20	20	-	60	-	100

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Unit 1: Milk and its Properties** Definition, composition of milk from different species, colostrum. Physico-Chemical properties of milk. Nutritive value of milk and milk products	20	5
2	**Unit 2: Effect of heat on Milk** Processing of milk- pasteurization by L T H T and HTST and UHT - filtration, UF and RO, clarification, cream separation, Homogenization and heat processing	20	5
3	**Unit 3: Milk and Milk Products** Classification of milk products. Manufacture of butter and butter oil (Ghee) Fermented milks Preparation of yoghurt and cheese	20	5
4	**Unit 4: Processing methods of milk products** Ice-cream- Method of preparation Manufacture of indigenous milk products - ghee, khoa, chhanna, paneer,dahi and shrikand Indian milk confectionary - Khoa and Chhanna based sweets.	25	8
5	**Unit 5: By Products of Dairy Industry** By products of dairy Industry and their utilization Packaging and storage of milk and milk products -Defects -Standards	10	4
6	**Unit 6: Milk Processing Sequence** Clarification, pasteurization, homogenization	5	3
Total		**100 %**	**30**

Text Book and Reference Book:

1. **Outlines of Dairy Technology** By Sukumar De
2. **Milk and Dairy Product Technology** By Edgar Spreer

a. Course Name: LAB-II Processing of Milk and Milk Products

b. Course Code: 11011304DS05

c. Prerequisite: Should be familiar with basic of milk and milk products

d. Rationale: Acquire knowledge about the milk technology

e. Course Learning Objective:

CLOBJ1	Stabilize farm prices and income: It stabilizes farm price by utilizing the excessproduce in value addition to provide additional income to the farmers.
CLOBJ2	Add variety to the diet: Value addition/processing make the food more attractiveand palatable
CLOBJ3	Learn foreign exchange through export of dairy products.

f. Course Learning Outcomes:

CLO 1	Different Composition and types of of milk and milk products.
CLO 2	Understanding the technology of various frozen milk products.
CLO 3	Discuss the various milk processing methods.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				T	**CE**	**P**	**T**	**P**	
-	**-**	**4**	**2**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**- Continuous Evaluation, **ESE-** End Semester Examination

Exp. No.	**Name of the Experiment**
1	Sampling and analysis of milk -physico chemical properties and composition, DMC and DYC reduction tests, presence of adulterants and preservatives
2	Standardization of milk for markets
3	Clarification and separation of milk
4	Heat processing of milk -Pasteurization
5	Preparation of butter and ghee
6	Ice-cream preparation
7	Preparation of dahi (Yogurt, curd), shrikhand, lassi etc
8	Preparation of khoa and khoa based sweets

9	Preparation of chena, paneer and chana based sweets
10	Visit to Dairy plant

Text Book and Reference Book:

1. **Food Analysis** By Shalini Sehgal
2. **DGHS Manual of Milk and Milk product** By FSSAI

a. Course Name: Food Additives

b. Course Code: 11011304DS06

c. Prerequisite: Should be familiar with basic of additives technology

d. Rationale: Acquire knowledge about the additive technology

e. Course Learning Objective:

CLOBJ 1	Provide an overview of the structure, composition, and food chemistry of additive product
CLOBJ 2	Gain Knowledge of the growth of the additive technology in Indian Food Processing industry.
CLOBJ 3	Understanding different additive food processes concepts and uses.

f. Course Learning Outcomes:

CLO 1	Discuss and use of aseptic technique to properly handle microorganisms to avoid contamination
CLO 2	Understand and apply the knowledge to handle microscopes to observe stained microorganisms
CLO 3	Identify the microorganisms using staining techniques.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				MSE	**CE**	**P**	**Theory**	**P**	
4	**-**	**0**	**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; **T**- Tutorial; **P-** Practical; **C**- Credit; **MSE-** Mid-Semester Evaluation, **CE**-Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage (%)	Teaching Hours
1	**Unit 1: Food Additives** Naturally occurring food additives Preservatives Colours Flavoring agents Sweeteners Emulsifier and stabilizers Antioxidants	25	15
2	**Unit 2: Food Colour** Food colour (natural and artificial) Pigments their importance and utilization as food colour	20	12
3	Unit. 3 Food Flavor Taste and flavour inducer, potentiater Food preservatives and their chemical action	20	12
4	**Unit 4: Antimicrobial Agents & Stabilizers** Role mode of action salt, chelating agents stabilizers and thickners, Polyhydric alcohol,anticaking agent,firming and colouring agent,flour bleaching agent,antioxidants, non-nutritional sweetness and antimicrobial agents	25	15
5	**Unit 5 : Antioxidants** Antioxidants, non-nutritional sweetness and antimicrobial agents	10	6
Total		**100 %**	**60**

Text Book and Reference Book:

1. Food Additives By A Branen
2. Food Additives and Human Health By Seyed Mohammad Nabavi