Diploma in Food Technology
Revised Curriculum
2019

PREMLILA VITHALDAS POLYTECHNIC

SNDT WOMEN'S UNIVERSITY

JUHU ROAD, SANTACRUZ (WEST)

MUMBAI-400049

OBJECTIVES OF THE DEPARTMENT

- To train students to actively participate in every facet of the country's growing food industry.
- To develop entrepreneurial spirit among students for inspiring them to set up their own facilities.
- To spread awareness in the community about the Science of Technology of food processing for use in the household and cottage sector.
- To take up developmental works for new products and for improved formulations for traditional food products.
- To develop personalities of the students to enable them to occupy senior positions in the industry.
- To collaborate actively with industry for mutual benefits.
- To insulate a spirit of social service in students by involving them in the activity of community polytechnic.

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Semester I

Paper Code	Subjects	L	P/T	D	TP	TW	P/V	T	Credits
1001	Principles of Food Technology (Th)	2	3	1		50	50	100	4

1002	Principles of Food Technology (Pr)								
1003	Food Constituents and Nutrition(Th)	2	---	1	50	50	---	100	2
1004	Basic Chemistry (Th)	2	3	1	50	50	50	100	4
1005	Basic Chemistry (PR)								
1006	Basic Microbiology (Th)	2	2	1	50	50	50	100	3
1007	Basic Microbiology(PR)								
1008	Mathematics and Statistics (Th)	2	---	1	50	50	50	100	2
1009	Unit Operation- I (Th)	2	2	1	50	50	50	100	3
1010	Unit Operation- I (PR)								
1011	Skill in Language Communication – I	2	2	1	50	50	50	100	2
	Total	**14**	**12**					**700**	**20**

SEMESTER – I

(1001) PRINCIPLES OF FOOD TECHNOLOGY

(Theory)

Theory Hrs/Week: 2 Credits: 2

Topic No.	Topic	No. of Hours	% Weightage
1.	History Evolution of cooking processes, Fermentation Process and Food Preservation processes	2	--
2.	Objectives of Food Processing An introduction to objectives such as : i. Improvement of digestibility ii. Improvement of Nutritive Quality iii. Improvement of acceptability, flavour, appearance, taste iv. Improvement of Texture v. Prolongation of shelf-life	2	6
3.	Food commodities and their production i. Cereal crops, pulses, legumes, oil seeds, nuts growth, use of agrochemicals in conservation, harvest, post-harvest treatments, storage – an introduction ii. Fruits and Vegetables – growth, crop protection harvest – commercially important types ripening storage – an introduction. iii. Milk – rearing milk animals, improvement of milk yield collection and transportation of milk – an introduction. iv. Plantation crops – coffee, tea, cocoa, spices- growth, harvest. Type- an introduction. v. Meat, fish, Poultry- Rearing meat, producers methods for fattening meat animals, fish culture, marine fishing practices. Poultry for meat and eggs- an introduction. vi. Derived commodities- Sugar, Jaggery,	10	36

	Starch, salt etc.		
4.	Improvement of Digestibility Process such as milling, cooking, fermentation etc. An introduction to the processes and their purpose i.e. removal of un-digestible material, softening,gelatinization, denaturation, inactivation of enzyme inhibitors.	03	10
5.	Improvement of acceptability Appearance, taste, texture and flavour- improved acceptability through: i. Thermal treatment such as baking, grilling, boiling, frying-changes taking place there in an introduction to browning reaction. ii. Blending with spices, condiments, additives iii. Fermentation reactions iv. Freezing- Ice cream etc. v. Fabrication – Shaping and Improvement in texture, taste use of comminute material to build up fabricated articles – traditional types, modern extruded and other fabricated types. vi. Gelling. vii. Textureisation.	05	18
6.	Improvement of nutritive quality Process such as fortification, enrichment, germination fermentation, inactivation of a nutritional factors, stabilization of nutrients and increasing the availability of nutrients.	02	06
7.	Improvement in Texture Use of methods to prevent loss/ absorption of moisture, a brief idea about rheology and viscosity, aeration, colloids and emulsions.	02	06
8.	Prolongation of Shelf-life An introduction of spoilage of food and principles behind dehydration, freezing, low	02	12

	temperature storage, heat treatment. Use of chemicals in the preservation of food and packing.		
9.	Simulation Vegetarian meat. Use of additives in simulation	02	02
10.	New sources of food. Single cell protein, Leaf protein, protein from waste etc.	01	04
	Total	30	

SEMESTER – I

(1002) PRINCIPLES OF FOOD TECHNOLOGY

(Theory)

Practical Hrs/Week: 2 Credits: 2

Topic No.	Topic	No. of Practical Hours
1.	Preparation of Brines and Syrups	6
2.	Preparation of sugar preserves, Jam, Jelly, Marmalade, Candied/ Crystallised fruit, murabba	27
3.	Preparation of salt preserves- pickles	12
	Total	**45**

SEMESTER – I

(1003) FOOD CONSTITUENTSAND NUTRITION

(Theory)

Theory Hrs/Week: 2 Credits: 2

Topic No.	Topic	No. of Practical Hours	% Weightage
1.	The constituents of food	1	5

2.	Carbohydrates- their functions in the diet	2	5
3.	Sources of carbohydrate in the diet	1	5
4.	Effects of excess carbohydrate and fat intake	1	5
5.	Fats- their functions in the diet	2	5
6.	Sources of fats and type of fats available	1	5
7.	Proteins – their functions in the diet	1	10
8.	Essential amino acids and protein quality	2	5
9.	Sources of protein in the diet	1	5
10.	Protein requirements	1	5
11.	World food shortage and protein calorie malnutrition	2	10
12.	Unconventional sources of protein	2	5
13.	Vitamins- deficiency symptoms, sources, RDI Losses during cooking and storage	5	10
14.	Mineral elements and water	5	10
15.	Concept of RDA, ADI, ICMR recommendations for calorie requirement for men, Women and children. All other nutrient requirements, concept of nutraceuticals	3	10

SEMESTER-1

(1004)BASIC CHEMISTRY

(Theory)

Theory Hrs/week:2 Credits:2

Topic No.	Topic	No of Hours
1	Acids and Bases: Acids-Definition, properties, basicity, Eq.Wt. Bases- Definition, properties, acidity, Eq.Wt. Introduction to Normality, Molarity, Numericals. Definition of pH, pH scale, application.	4
2	The formation of molecules -The chemical bond -Carbon and formation of carbon compounds -Detection and estimation of elements in Organic compounds	5
3	Aliphatic and aromatic compounds, homologous series	1
4	Hydrocarbons- alkanes-Formulae, important reaction and uses.	1
5	Alkenes-addition reaction and polymerization	1
6	Alkynes and halogen derivatives of hydrocarbon	2
7	Functional group and their importance	2
8	Alcohol and carboxylic acid	2
9	Amines and amino acids	2
10	Esters, aldehydes and ketones	2
11	Solutions and colloids	3
12	Water and ice- Chemical and physical properties	3
13	The proximate composition of food, relationship of food Chemistry with other applied fields of Chemistry	2

SEMESTER – I

(1005) BASIC CHEMISTRY

(Practical)

Pract. Hrs/Week: 3 Credits: 2

Topic No.	Topic	No. of Practical Hours
1.	Study of Apparatus in chemical Laboratory	2
2.	Separation of Mixtures	6
3.	Volumetric Analysis	9
4.	Inorganic Qualitative Analysis	9
5.	Gravimetric Analysis	6
6.	Organic Spotting	6
7.	Determination of B.P. & M.P.	3
8.	Detection of Nitrogen, Sulphur, Halogens etc. in organic compounds	2
9.	Estimation of Nitrogen, Sulphur, Halogens in organic compounds (partly theoretical, partly by demonstration)	2
	Total	45

SEMESTER – I

(1006) BASIC MICROBIOLOGY

(Theory)

Theory Hrs/Week: 2 Credits: 2

Topic No.	Topic	No. of Hours	% Weightage
1.	Introduction to microbiology	1	2
2.	Classification of microbiology	2	8
3.	Protozoa, Algae, Viruses, Fungi- morphology reproduction, uses & harmful effects	5	18
4.	Bacteria- a structure of the bacterial cell, motility reproduction, spore formation, toxins, bacterial taxonomy, selective staining techniques, Gram Positive and Gram negative bacteria	6	25
5.	Growth curve- factors affecting growth and death	5	15
6.	Control of microbial growth	3	12
7.	Sterilization and disinfection	4	10
8.	Nutritional requirements and media	4	10
	Total	**30**	

SEMESTER – I

(1007) BASIC MICROBIOLOGY

(Practical)

Theory Hrs/Week: 2 Credits: 1

Topic No.	Topic	No. of Hours
1.	Study and maintenance of equipment's, glassware, incubator, oven etc.	2
2.	Sterilization of media & glassware	2
3.	Use and maintenance of compound microscope	2
4.	Cleaning of microscope slides & preparation of bacteria smear for simple staining	2
5.	Monochrome staining	4
6.	Gram's staining	4
7.	Negative staining	2
8.	Cell wall staining	2
9.	Capsule staining	2
10.	Endospore staining	2
11.	Metachromatic granules staining	2

12.	Preparation of wet mount	4
	Total	**30**

SEMESTER – I

MATHEMATICS & STATISTICS

(Theory)

Theory Hrs/Week: 2 Credits: 2

Topic No.	Topic	No. of Hours	% Weightage
1.	Ratio and proportion:- Ratio, terms of a ratio, property of ratio, comparison of ratios, proportion, property of proportion.	3	12
2.	Logarithm:- Definition, laws of logarithm, common logarithms, Method to determine logarithm of a number, Antilogarithms	4	16
3.	Differentiation and Integration:- Idea of a function and limits. Derivative of a function, standard derivatives, derivatives of product of two functions. Derivatives of quotient of two functions.	8	20

	Integration, standard integral		
4.	Collection of statistical data. Primary data & Secondary data	1	4
5.	Organization & classification of data Rules for classification, construction of frequency table, discrete frequency distribution. Grouped frequency distribution, inclusive & exclusive class intervals	2	8
6.	Measures of central tendency Arithmetic mean of a discrete frequency distribution & grouped frequency distribution. Arithmetic mean of a combined group. Median of a grouped frequency distribution & discrete frequency distribution. Mode of a grouped frequency distribution & discrete frequency distribution	3 2 2	12 8 4
7.	Measures of dispersion Range, mean deviation, Standard deviation sampling techniques & probability	3 2	16
	Total	30	

SEMESTER – I

UNIT OPERATION_-I

(Theory)

No. of hours/week: 1

Topic No.	Topic	No. of hours	% Weightage

1.	Introduction to engineering calculations, physical variables, dimensions, unit, etc.	2	
2.	Pressure gauge, absolute pressure, pressure measuring devices, temperature measuring devices, etc.	4	
3.	Engineering parameters, density and specific gravity	2	
4.	Fuels and combustion of fuels	2	
5.	Raw material preparation cleaning, sorting, etc.	3	
6.	Blanching- theory of blanching, equipment's,etc.	2	
7.	Pasteurisation – theory of blanching, equipment's, etc.	2	
	Total	**17**	

SEMESTER-I

(1010) UNIT OPERATIONS- I

(PRACTICALS)

No. of hours/week: 2

Topic No.	Topic	No. of hours
1.	Use of physical balance, Vernier callipers, micrometre screw, thermometer	4
2.	To determine the specific gravity of a solid and liquid	4
3.	To determine the refractive index of glass	4
4.	To determine the refractive index of liquid using refractometer	4
5.	To determine the latent heat of fusion of ice	4
6.	One type of a simple electrical circuit	4
7.	To determine the optical rotation of a given substance using polarimetry	4
8.	To take reading in a colorimeter	4
	Total	**32**

SEMESTER – I

(1011) SKILLS IN LANGUAGE COMMUNICATION

(Theory)

No. of hours/week: 2 Credits:

Topic No.	Topic	No. of hours	% Weightage
1.	Grammar Review of Tenses with special reference to Simple Present, Present perfect, Simple Past, Future Concord of subject and Verb Relative Pronouns Use of 'since', 'for', from' Use of although 'in', 'of', 'despite' Prepositional Phrases Conditional Sentences Use of Participles/ Present & Past Passive Voice	10	20
2.	Oral communication Questions/ Responses Explaining Processes	5	20
3.	Vocabulary Synonyms/ Antonyms Derivational forms Food Technology related Terminology a) Material b) Equipment c) Processes	4	8
4.	Comprehension Food Technology related passages – 10 units a. Global } b. Factual } Comprehension c. Inferential } d. Lexical }	5	32

	e. Connective with sentences f. Paragraph Links g. Causes – effects relationships		
5.	Writing Identification of topic sentence in paragraphs Expansion of topic sentence into Paragraphs Extended Writing	6	20
	Total	**30**	

Semester II

Paper Code	Subjects	L	P/T	D	TP	TW	P/V	T	Credits
2001	Principle of food preservation	2	4	1	50	50	50	100	4
2002	Principle of food preservation (PR)								
2003	Food additives	2	---	1	50	50	---	100	2
2004	Food chemistry	2	3	1	50	50		100	4
2005	Food chemistry (PR)								
2006	Food microbiology	1	4	1	50	50		100	3
2007	Food microbiology (PR)								
2008	Unit operation-II	1	---	1	50	50		100	1

2009	Skill in language communication-II	2	---	1	50	50		100	2
2010	Environmental Studies	2	1	1	50	50		100	2
2011	Computer Skills (PR)	--	2	1	50	50		100	1
	Total	**11**	**10**					**800**	**16**

SEMESTER – II

(2001) PRINCIPLE OF FOOD PERSEVATION

(Theory)

Theory hours/week: 2 Credits:2

Topic No.	Topic	No. of hours	% Weightage
1.	History of preservation a. Using sugar b. Salting and pickling c. Fermentation d. Smoking and curing e. Sun drying	4	8
2.	Food spoilage Type of spoilage and spoilage agencies, contamination by dirt, dust chemicals, metals, non-edible plant materials, etc.	4	12

	Mechanical injury and physical change. Moisture absorption and desiccation Concept of water activity Chemical spoilage: Changes in chemical composition due to oxidation and effect of heat, light, chemicals, water, etc. Maillard Reaction: Caramelisation, Biochemical and Microbial spoilage: Due to enzyme s in the fresh foods, due to external biological agencies, microorganisms, insects etc. Spoilage due to insects, rodents etc. Spoilage type in different foods.		
3.	Preservation of low moisture foods: Storage of food grains – construction of water houses - packaging of food grain products – infestation and pest control. Application of insecticides, fungicides and their dosages. Indigenous methods of preservation.	3	8
4.	Low Temperature Preservation: Refrigeration and freezing, principles of refrigeration. Cold storage, controlled atmosphere storage. Freezing: Methods of freezing quick v/s show freezing, ice crystals formation. Changing during freezing, Treatment of foods before freezing, packaging and storage of frozen products. Thawing pre-cooked frozen foods.	5	20
5.	Canning: Canning principles- classification of food for processing, preparing, foods for preservation(Washing, grading, peeling, Blanching, Sulphuring) Canning operation, (Filling, exhausting, seaming, retorting, cooling)	4	20
6.	Dehydration: Sun – drying and mechanical dehydration Pre-treatment of foods before dehydration Dehydration and rehydration ratio Packaging and storage of dehydrated products Freezing drying – dehydro freezing –	5	20

	Concentration.		
7.	Radiation – Principle, source of radiation – Units and dosimetry. Radiation process evaluation – present status.	4	8
8.	Concept of hurdle technology, minimally processed foods and newer non thermal methods of processing.	1	4
	Total	**30**	

SEMESTER – II

(2002) PRINCIPLE OF FOOD PERSEVATION

(Practical)

Practical hours/week: 4 Credits: 2

Topic No.	Topic	No. of hours
1.	Preservation by dehydration	12
2.	Preservation with chemicals	10
3.	Canning and evaluation of canned products	10
4.	Fermentation – Preparation of alcoholic beverages, vinegar, Fermented milks, fermented Cereal Products,	8
5.	Freezing preservation	8
6.	Combination methods	4
7.	Introduction of Bakery Skills a. Creaming and mixing of ingredients in Bakery Practice b. A simple Chemically – Leavened flour confection c. A simple yeast – leavened flour confection d. Bread e. Introduction to flour confection design and decoration	8
	Total	**60**

SEMESTER – II

(2003) FOOD ADDITIVES

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% weightage
1.	Introduction to Food Additives	2	8
2.	Additives and safety	1	12
3.	Classes of Food Additives a. Preservatives b. Anti-Oxidants c. Emulsifiers and stabilizers d. Food colours e. Food flavours f. Sequesterents g. Anticaking agents h. Humectants i. Firming and crisping agents j. Sweeteners k. Nutritive additives l. Acids, Buffers, Bases m. Antibiotic	12	80
	Total	**15**	

NOTE: (a) to (m) will include legislation (permitted levels etc.) with reference to the additive

concerned.

SEMESTER – II

(2004) UNIT OPERATIONS IN FOOD PROCESSING - II

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% weightage
1.	Unit and dimensions, definition of unit operation	1	8
2.	Material and energy balances, first law of thermodynamics. Simple problems of material balances.	3	20
3.	Fluid flow – type of fluid statics, fluid dynamics introduction – flow measurement, concept of Reynolds number.	2	20
4.	Heat transfer – definitions of conduction – steady and unsteady state, thermal conductivity, heat capacity, convection coefficients, radiation equation.	2	20
5.	Heat transfer application – Heat exchangers, refrigeration and freezing equipment, baking equipment and processing equipment, basic engineering principles behind heat processing of canned and bottled foods.	2	12
6.	Mechanical separations – filtration, centrifugal separations, utilization of physical factors – size, shape, colour, magnetic properties.	2	12

7.	Materials handling – mixing, homogenization, conveying of solids and fluids.	3	8
	Total	**15**	

SEMESTER – II

(2005) FOOD MICROBIOLOGY

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% weightage
1.	Different methods of measuring growth and factors that are affecting the growth of bacteria in different foods	2	15
2.	Micro-organisms associated with foods	2	12
3.	Sources of micro-organism and contamination of food	1	5
4.	Spoilage of food – biological and chemical	1	5
5.	Spoilage of canned foods	1	5
6.	Fermentation and putrification	1	5

7.	Use of micro-organisms in food and as food	2	12
8.	Food borne illness	1	8
9.	Control of bacteria in food	1	12
10.	Indicator organisms	1	6
11.	Food poisoning – microbial, chemical, infestation	2	15
	Total	**15**	

SEMESTER – II

(2006) FOOD MICROBIOLOGY

(Practical)

Practical Hours/week: 4 Credits: 2

Topic No.	Topic	No. of hours
1-5	Preparation and sterilization of specific types of media	16
6	Ubiquity of micro-organisms	4
7	Aseptic transfer of microbes on solid and liquid media	4

8-9	Streaking for isolation of organisms	4
10	Study of growth of organisms in liquid medium	2
11	Cultural characteristics of micro-organism	2
12	Motility test	4
13	Unicellular fungi- yeast	4
14	Filamentous fungi-mold	4
15	Effect of temperature on survival	4
16	Isolation of micro-organism from fermented food and spoiled foods	4
17	Effect of environmental influences on the growth of Micro-organism	4
18	Isolation of spores and study of their behaviour	4
	Total	**60**

SEMESTER – II

(2007) FOOD CHEMISTRY

(Theory)

Theory Hours/week: 1

Credits: 1

Topic No.	Topic	No. of hours	% weightage
1.	Carbohydrates- Types and content in foods. Locus in raw materials. Brief review of structure and reactions. Sweetness and structure. Function in food texture and flavour	5	16
2.	Specific carbohydrates: starch- occurrence. Types, particulate structure, characteristic for processing, modified starches. Pectin – occurrence and uses. Other polysaccharides- gums. Cellulose, hemicellulose, sea weed polysaccharides	4	16
3.	Lipids: Brief review of structure and reactions of glycerides and phospholipids, lipid content in food systems, functional properties of lipids. Nutritive value and essential fatty acids, glycolipids (Introduction)	1	4
4.	Fat and oil Technology: Inter esterification, effects of processing and cooking, decomposition, type of rancidity (hydrolytic , oxidative) use of antioxidants	2	4
5.	Proteins and amino acids: Brief review of structure and functions, protein content in food systems, Essential amino acids lipoproteins	3	12
6.	Processing and proteins: Degradation by hydrolysis of proteins, effects on functional properties and nutritive quality, tests for protein degradation. Effects of processing on essential amino acids, supplements or fortifying, non-enzymatic browning.	3	12
7.	Plan pigments: Chemical structure, location, classification, Occurrence, mechanism of degradation	3	8
8.	Biological food systems: Distribution and organization of chemical constituents.	2	8
9.	Muscle tissue: Gross anatomy and microstructure, chemical composition. Cell structure, effects of ante mortem conditions and	2	2

	post-mortem changes (glycolysis), relationship of texture to structure and composition, changes through processing (curing, smoking, dehydration, freezing and packaging)		
10.	Plant Tissue: Gross anatomy and microstructure, chemical composition of leaves, buds, seeds etc. Cell structure, texture to structure, turgidity changes through processing and storage (respiration, sugar-starch equilibria etc.)	2	12
11.	Special systems: Milk, eggs and other special systems, chemical composition, structure and changes in processing and storage.	2	4
12.	Flavour and Texture: Relation to chemical composition, structure and processing, biogenesis of flavours.	1	4
	Total	**30**	

SEMESTER – II

(2008) FOOD CHEMISTRY

(Practical)

Practical Hours/week: 3

Credits: 2

Topic No.	Topic	No. of hours
1.	Qualitative tests for carbohydrates Estimation of Glucose Estimation of sucrose by inversion To determine % composition of a given mixture of Lactose and Sucrose	6
2.	Classification of proteins, colour reactions of Amino Acid	3
3.	Chromatography for sugars and amino acids	6
	Estimation of glucose and fructose by colorimetric Using anthrone Using DNS	6
4.	Proximate composition analysis (Moisture and Total solids) Proximate composition analysis (Total ash)	3
5.	Soxhlet extraction of fat Protein estimation by Kjeldhal methods (Demo.)	3
6.	Estimation of Amylose and Amylopectin in starch	3
7.	Proximate composition analysis (Crude Fibre)	3

8	Estimation of Vitamin C	3
9.	Proximate Composition analysis (Carbohydrates by difference)	3
10	Proximate composition analysis (Calculation of Nutritive Value)	3
11.	Estimation of Chlorophyll	3
	Total	**45**

SEMESTER – II

(2009)SKILL IN LAUGUAGE COMMUNICATION

(Theory)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% weightage
1.	Grammar: 1. Review of tense 2. Concord of subject and verb 3. Complex sentences with concepts of time, place, reason, condition, concession, supposition, result. 4. Reported speeds 5. Relative clauses 6. Noun clauses 7. Synthesis of sentences	6	20

2.	Oral communication: 1. Specking in semi-official situation 2. Making inquires 3. Giving direction s 4. Speaking in laboratory situations 5. Asking for Classification 6. Classifying 7. Suggestion 8. Informing	5	20
3.	Vocabulary: 1. Food technology related terminology 2. Terms used in industry 3. Donation and Connotation	4	12
4.	Comprehension: 1. Global } 2. Factual } 3. Inferential } comprehension 4. Lexical } 5. Connectives within sentences 6. Chart-filling, table – filling (information) 7. Cause – effect relationship	8	20
5.	Information Transfer : 1. Interpretation of statistical data tables, charts, etc. 2. Presentation of information through charts/tables/graphs 3. Description of Diagrams 4. Presentation of written material as diagram	3	8
6.	Writing: 1. Note – making from passages 2. Note –Taking from lectures 3. Summarizing 4. Reporting	4	20

	Total	**30**	

SEMESTER – II

(2010) ENVIRONMENTAL STUDIES

Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage
1.	Current Environmental Concerns:; Global Warming, Renewable Sources of Energy	4	4
2.	Nosie Pollution and Soil pollution	4	8
3.	Biomedical Wastes: Characteristics and Method of Disposal	5	32
4.	Environmental Law	2	4
5.	Physical, Chemical and Biological characteristics of water (testing for biological characteristics: Indicator Organisms)	6	20
6.	Ecology	2	8
7.	Rain water harvesting	2	8
8.	Air pollution: Causes and effects	5	16
	Total	**30**	

SEMESTER – II

(2011) COMPUTER SKILLS

(Practical)

PR:- 2hrs/week Credits 1

Topic No.	Topics and Sub-topics	No.of Hours
1.	**Computer Fundamentals** 1.1. Definition of Computer, Functionality of Computer, Applications, Advantages and Disadvantages of computer, Computer Generation, Types of input/output devices 1.2. Classification of computer, types of computer memory, Hardware and Software concept of computer-System software (operating system), Application software, 1.3. Computer Networks, Advantages of computer networks, Important applications of computer networks Types of network Modems, Computer Virus. 1.4. Introduction to components of computer, Multimedia, CD ROM , Sound System, Types of Printer and Scanner, Installing Printer and scanner on computer, Data Copying on CD,DVD and pen drive, , Demo on Installation of Antivirus , and Updating the Antivirus	6
2.	**Introduction to Open Office Software.** 2.1. Introduction to open Office. 2.2 Introduction to different toolbars on screen. 2.3 Using help option. 2.4 Explaining different extensions of file saving.	5

	2.5 Converting the document to PDF format.	
3.	**Working with Open Office word processor** 3.1 Introduction to Word Processing interface, Creating document, Saving the documents, Opening the document, 3.2 Working with text (Select, cut copy, paste), 3.3 Finding and replacing text, Inserting special characters, 3.4 Checking spelling and grammar, Formatting characters, 3.5 Creating numbered and bulleted list, Working with indents, 3.6 Creating headers and footers, Numbering Pages, Page borders, Using Mail Merge, Working with Tables, Printing and previewing documents	10
4.	**Internet** 4.1. Introduction to internet and web, 4.2. Introduction to web browsers, Basic parts of browser Window. 4.3. Search Engines, Create Email IDs, 4.4. Working with different features of Email-ID, 4.5. Printing through Email, 4.6. Email etiquettes.	5
5.	**PROJECT**	4
	TOTAL	30

Reference Books – 1. Computer Manuals provided by college

2. wiki.documentation.org/images/e/e6/WG42-WRITERGuideLO.pdf

3.Computer Fundamental by P.K.Sinha, Wadsworth, Inc

References:

https://wiki.documentfoundation.org/images/3/35/WG40-WriterGuideLO.pdf

https://wiki.documentfoundation.org/images/4/47/CG41-CalcGuideLO.pdf

https://wiki.documentfoundation.org/images/a/ac/IG40-ImpressGuideLO.pdf

Semester III

Paper Code	Subjects	L	P/T	D	TP	TW	P/V	T	Credits
3001	Cereal Technology (Th)	2	---	1	50	50		100	2
3002	Dairy Technology (Th)	2		1	50	50	50	100	2
3003	Food Technology (Pr)	---	8	--		50	50	100	4
3004	Food Analysis – I (Th)	2	6	1	50	50	50	100	4
3005	Food Analysis – I (Pr)								
3006	Food Engineering (Th)	2	---	1	50	50	50	100	2
3007	Food Microbiology –II (Th)	1	4	1	50	50	50	100	3
3008	Food Microbiology –II (Pr)								

3009	Skills in Language Communication – III	2	---	1	50	50	50	100	2
3010	Food Biochemistry (Th)	1	---	1	50	50	---	100	1
	Total	**12**	**18**					**800**	**20**

SEMESTER – III

(3001) CEREAL TECHNOLOGY

(TECHNOLOGY OF CEREALS, SPICES AND FLAVOURS)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage
1.	Cereals and Pluses – Major Cereals and pluses in India Milling Practise – Milling of Wheat, Rice and Pluses by product Nutritive losses – Parboiled Rice, Bye-products	6	20
2.	Bakery products – Technology of Bread, Biscuits and Cakes	6	20
3.	Pasta Products – Macaroni, Spaghetti, Vermicelli etc.	4	12
4.	Manufacture of Starch from maize and tapioca	2	12
5.	Indian cereal products – puffed, flaked (pova), fabricated, (Chapattis, puri, nan, pulkas, vada, chakli, fermented, idli, dhokla) flour – based Indian	1	4

	confections		
6.	Premixes of cereal and pulse products	2	4
7.	Breakfast cereals – corn flasks, rolled oats, specially products	2	8
8.	Classification – different type of flavours, flavouring extracts, Oleoresins, blending of spices, technology of vinegar	6	20
	Total	**30**	

SEMESTER – III

(3002) DAIRY TECHNOLOGY

(TECHNOLOGY OF MILK AND DAIRY PRODUCTS)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage
1.	Problems of Milk collection	1	
2.	Cow's and Buffalo's Milk – composition of milk	1	4

3.	Pasteurization, different types of packaging e.g. Bottling, filling in pouches	4	8
4.	Sterilised milk	1	8
5.	Skim Milk, toned milk, whole milk	2	8
6.	Manufacture of cream, butter, ghee	4	16
7.	Manufacture of Cheese	2	4
8.	Manufacture of yoghurt, curds etc.	4	20
9.	Manufacture of Ice-cream	3	20
10.	Manufacture of Skim Milk Powder, Whole milk powder, Condensed milk	4	8
11.	Infant Foods	2	4
12.	Indigenous milk products such as Paneer	2	
	Total	**30**	

SEMESTER – II

(3003) FOODTECHNOLOGY-I

(Practical)

Practical Hours/week: 8 Credits: 4

Topic No.	Topic	No. of hours
1.	Processing of spices and preparation of Masalas: a) Masalas – Rasam powder, Sambar Powder, Pav Bhaji masala, Garam masala, Pani Puri Masala, Tea Masala, Milk Masala etc.	12

	b) Preparation of Oleoresin from ginger/turmeric pepper by solvent extraction c) Isolation of essential oil of coriander/cumin by steam distillation.	
2.	<u>Preparation of cereal based products:</u> a) Breads, Biscuits, Cookies, Cakes, etc. b) Indian cereal Products – chapatti, idli, dhokla vada, etc. c) Popular fried Indian cereal products – Dal, Sev, Gathia, Bundi, Papdi,Chakli, etc. d) Extruded Products – Noodles, Vermicelli, and Sago Chips etc. e) Papads f) Preparation of popcorn and rice/corn/ jawar flakes.	42
3.	<u>Preparation of dairy products:</u> Paneer, Ice-cream,Kulfi,Dahi, Yoghurt, Lassi, Rabadi,Mil-based Confections (Pedha, Burfi, Shrikhand, Rsagolla, Gulab jamun etc.) & Whey – based beverages	22
4.	<u>Fruits and Vegetables products:</u> a) Mango products – Squash, jam, canning of pulp, nectar, pickle, canning of slices, juice, leather, mango preserve etc. b) Processing of corn, plum, peaches, pears	8 24
5.	Instant mixes based on cereals and pulses, milk- Instant kheer, Instant pulaves, Instant sambar, idli etc. Instant mixes for Gulab jamuns, halva, jalebi etc.	12
	Total	**120**

SEMESTER – III

(3004) FOOD ANALYSIS-I

(Theory)

Including food adulteration problem and food laws and standards

Theory Hours/week: 2 Practical Hrs. /Week: 6
Credits: 5

Topic No.	Topic	No. of hours	% Weightage
1.	Objectives of food analysis	1	4
2.	Natural food composition variability, range and limits		
3.	Stages at which food gets contaminated, nature of contaminants	1	6
4.	General principles of methods of detection of food adulteration and confirmation of food quality standards, moisture, ash , microscopy, physical characteristics, refractive index, total solids, specific chemical constituents etc. and their significance	7	30
5.	Legislation with respect to foods- PFA Act, FPO, and MFPO, EIC rules, weights and measures Act. Food standards of important countries (a brief outlines of the Acts concerned and the agencies imposing them)	10	24
6.	Methods of sampling and reporting analytical results	3	6
7.	Adulteration – its definition, international and incidental adulterants, common adulterants in various classes of foods their ill effects Milk and milk products Sugar foods and starches including sugar, sugar confectionary and honey. Cereals and cereal products Spices, condiments and vinegar Oils and Fats	7	20
8.	The problem of pesticide residues and packaging hazards	1	10
	Total	**30**	

SEMESTER – III

(3005) FOOD ANALYSIS-I

(Practical)

Practical Hrs. /Week: 6 Credits: 3

Topic No.	Topic	No. of hours
1.	1. Milk and Milk products	
	i. Milk:	6
	a) Total solid, %fat, titration acidity, phosphatase test, stationary turbidity test, adulteration of milk, presence of cane sugar, starch, soda, urea, salt, sugar	
	b) Rapid platform test : clot on boiling, alcohol test, red alkali test,sediment test bromothymol blue test	
	c) Calcium by EDTA method	
	ii. Condensed milk: total milk solids, fat, titration acidity, sucrose	3
	iii. Milk powder : moisture, ash titratable acidity, fat, solubility index	3
	iv. Butter: fat, moisture, titratable acidity	3
	v. Ghee; RM,P & K value, boudomins test (test for adulteration)	3
	vi. Cheese: moisture, milk fat , salt, % protein	
	vii. Ice-cream: total solids, acidity, fat, sucrose, overrun	6
	viii. Shrikhand: titratable acidity, moisture, fat, %protein, % sugar	6 6

		9
2.	Wheat flour analysis moisture, ash, maltose value, sedimentation value, gluten, acid insoluble ash, alcoholic acidity, granularity	6
3.	Microscopy of starch & purity of starch & Analysis of yeast: % moisture, dough – raising capacity	6
4.	Analysis of species: i) Analysis of whole spice: Alcohol soluble extract, cold soluble extract, crude fibre, fixed ether extract, water soluble and acid insoluble ash, chromate test. Volatile oil test ii) Analysis of powder spice mix: moisture, ash, salt content.	6 3
5.	Analysis of vinegar: total acid, ash, total acidity, volatile acidity,	6
6.	Analysis of baking powder: Total carbon dioxide and available carbon dioxide	3
7.	Analysis of biscuit: moisture, ash, fat, acid insoluble ash, protein	6
8.	Analysis of bread: moisture, ash, acid insoluble ash, alcoholic acidity, physical parameter(volume)	3
9.	Adulteration test: Detection of adulterant in asafoetida, bura sugar, cardamom, turmeric, chilli powder, coffee, coriander powder, clove, cumin seeds, Jaggery, rava, supari, tea dust, edible oil, sago, coconut oil, peanut oil, olive oil, bajara, cinnamon, tur dal, chana dal	3
10.	Analysis of water: Total solids, pH, ash, alkalinity, temporary and permanent hardness, chlorine, and chemical oxygen demand.	3
	Total	**90**

SEMESTER – III

(3006) FOOD ENGINEERING

(Theory)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage
1.	Sources of heat, heating process, steam and its use, use of steam tables, study of boiler, ovens.	4	12
2.	Dehydration, Drying during constant rate and falling rate periods, mass transfer, diffusion, principles of operation of drying curves, dryers.	4	20
3.	a) Psychrometry – Properties of air-water mixture, psychrometric charts and their use. b) Refrigeration – compression cycle, use of liquefied gases as contact refrigerants – cold storage and freezing equipment's.	2	12
4.	Contact equilibrium separations (Introduction)	1	4
5.	Evaporation and Distillation – Use of stages, types	3	16
6.	Leaching and Extraction, gas absorption, hydrogenation of oils	1	4
7.	Size reduction and its application in food industry, Milling equipment's, size separation, homogenizer	5	16
8.	Process control (Introduction)	1	4
9.	Electricity and its use in food plants	2	4
10.	Basic packaging machinery, can sealing, bottle washing, filling, and sealing, powder fillers, liquid fillers, from – fill and seal systems.	3	8
11	Maintenance of food plant and equipment	1	
12.	Pumps, valves and conveyers	3	
	Total	**30**	

SEMESTER – III

(3007) FOOD MICROBIOLOGY -II

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% Weightage
1.	Microbiology of foods a) Milk & Milk products b) Meat, Fish, Poultry and eggs c) Fruits and Vegetables. d) Cereals products. Sources of contamination, spoilage and modes of preservation.	7	48
2.	Micro- organisms in processed foods such as bread, Idli, fermented products, curd, cheese, wines, beers, vinegar, modes of increasing the shelf-life.	8	52
	Total	**15**	

SEMESTER – III

(3008) FOOD MICROBIOLOGY - II

(Practical)

Practical Hrs. /Week:4 Credits: 2

Topic No.	Topic	No. of hours
1.	Study of E.coli	4
2.	Study of IMVIC Tests	4
3.	Carbohydrate fermentation by micro-organism	4
4.	Study of Staphylococci	4
5.	Study of Lactobacilli	4
6.	Study of Mesophillic Spore Formers	4
7.	Cultivation of Anaerobes	4
8.	Effect of temperature on organisms –TDT & TDP	4
9.	Effect of preservative	4
10.	Effect of salt and sugar	4
11.	Study of psychrophiles	4
12.	Study of sulphide sinkers	4
13.	Morphology, biochemical and cultural study of salmonella spp.	4
14	Exo- enzymes and the major food groups	4
15.	Challenge test	4
	Total	**30**

SEMESTER – III

(3009) SKILLS IN LANGUAGE COMMUNICATION

(Theory)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage
1.	Grammar Review of passive voice Conditional sentences Model Auxiliaries "Will", "Shall", "May", "Can", "Must"	6	20
2.	Oral Communication Describing Processes Describing Equipment Explaining Defects in Equipment's Interviews	4	20
3.	Comprehension (5 Units)	6	20
4.	Writing Reports of Laboratory Experiments Factory Visits Reports Correspondence Application/ Resumes Enquiries/ Replies to Inquiries Requests/ Replies to Requests Placing of orders	8	40
	Total	**24**	

SEMESTER – III

(3010) FOOD BIOCHEMISTRY

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% Weightage
1.	Cells – an introduction to structure and biochemical activity.	1	
2.	Tissues and organs	1	8
3.	The digestive system	2	12
4.	Introduction to other systems of the body, effect of food on their function. Digestion, Absorption and assimilation of food.	2	
5.	Metabolism- Fat - Carbohydrate - Protein (Including metabolic disorders and their effect, energy production)	8	60
6.	Co-enzymes and their relation to B- group vitamins	1	20
	Total	**15**	

Semester VI – University Examination

Paper Code	Subjects	L	P/ T	D	TP	TW	P/V	T	Credits
4001	Food Technology (Th)	3	8	1.5	50	50	50	100	7
4002	Food Technology (Pr)								
4003	Food Analysis –II (Th)	1	6	1	50	50	50	100	4
4004	Food Analysis –II (Pr)								
4005	Quality Control (Th)	1	---	1	50	50	50	100	1

4006	Food plant Sanitation (Th)	1	4	1	50	50	50	100	3
4007	Food plant Sanitation (Pr)								
4008	Food packaging– I (Th)	1	---	1	50	50	50	100	1
4009	Entrepreneurship - I (Th)	2			50	50	50	100	2
4010	Skills in language Communication-IV	2	---	1	50	50	50	100	2
	Total	**11**	**18**					**700**	**20**

SEMESTER – IV

(4001) FOOD TECHNOLOGY - II

(Theory)

Theory Hours/week: 3 Credits: 3

Topic No.	Topic	No. of hours	% Weightage
1.	**Technology of fruits and vegetables** Survey of common fruits and vegetables and classification Post-harvest storage – pre packaging Fruits: Ripening control –climatic and non – climatic	15	20

	fruits, general methods of processing and preservation by canning and bottling, chemicals, salts, drying, cold storage, freezing, pickling etc. Products: Fruit Juices, Concentrates and beverages – extraction, clarification, filtration, de-aeration, concentration, blending, filling and packaging procedures, machineries and operation, Squash, crush, juice and other beverages. Fruit based confectionary:Jam, jellies, marmalades, theory of gel formation – pectin sources, grades, fruit preserves, and murabba preparation – candied, glazed and crystallised fruits and peels. Chutney and pickles : preparation Tomato products: Juices, Puree, Ketchup, Machinery Required, Utilization of fruits and vegetable waste.		
2.	<u>Technology of Beverages:</u> 1. Alcoholic beverages a) Wine – Different type of wine manufacture b) Beer – type –manufacture c) Distilled liquors – type, definition, manufacture. 2. Non- Alcoholic beverages a) Carbonated beverages b) Type – ingredients – manufacture c) Water treatment, syrup making, mixing, carbonation gas volume, bottle washing, and bottle filling.	9	20
3.	<u>Technology of Meat, Fish and Poultry</u> Meat and Poultry: Type – slaughtering techniques – dressing, changes, rigormortis etc. Preservation by freezing, canning,drying etc. specially products- bacon, ham sausages, hamburgers, chicken and related products. Eggs: Structure, composition, Production, grading, storage, preservation of egg products. Fish: Classification- spoilage – handling of fish, preservation by freezing, canning, drying, salting etc. Fish products.	8	16
4.	<u>Technology of oils, fats and related products</u>	5	16

	Commercial sources of oils Processing of oils and fats Extraction Refining Hydrogenation Winterization Manufacture of Mayonnaise, salad dressing, shortening, margarine, butter etc.		
5.	**Technology of Cocoa and cocoa products** Variety of cocoa beans- fermentation – cocoa Powder manufacture – chocolate manufacture – defects, packaging and storage.	5	16
6.	**Technology of confectionary** Sugar and its production ,type Classification and preparation of Indian confections, sugar confectionery	2	8
7.	**Technology of food fermentations – an introduction**	4	
	Total	**45**	

SEMESTER – IV

(4002) FOOD TECHNOLOGY

(Practical's)

Practical Hours/week: 8 Credits: 4

Topic No.	Topic	No. of hours
1.	Manufacture of fish products/meat and poultry products/egg products	12
2.	Preparation of grape wine, cider etc.	8
3.	Instant soup mixes, ice-cream mixes, soft drink concentration etc.	8
4.	Stages in sugar boiling	4
5.	Preparation sugar confectionery and Indian confections like laddu, Mohanthal, Chikki, Mysor pak, Preparation of instant mixes for confections	20
6.	Preparation of fruits and vegetables a) Tomato b) Green peas, carrots & seasonal vegetable c) Guava & apple d) Citrus fruits e) Pineapple f) Tropical fruits such as sapota, karonda, ber, amla, Papaya Jamun etc. g) Dehydration of vegetables juices, mix, vegetable pickle, vegetable chips (guar, karela, okra, yam etc.) Canning of curried vegetables	40

7.	Synthetic syrups and sherbets	8
8.	Utilization of market food products for preparation of diverse formulations, market food products include instant mixes, condensed milk and noodles and other pasta products.	16
9.	Processing of oil and fat based products	8
	Total	**120**

SEMESTER – IV

(4003) FOOD ANALYSIS-II

(Theory)

Practical Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% Weightage
1.	Water for the food industry – standards for quality and their determination	2	14
2.	Analysis of fruit and vegetable products 1. Water 2. Beverages – Carbonated, alcoholic, non-alcoholic 3. Canned foods 4. Egg and egg products 5. Dehydrated and Frozen foods	11	70

3.	Nutritional labelling	2	16
	Total	**15**	

SEMESTER – IV

(4004) FOOD ANALYSIS – II

(Practical)

Practical Hours/week: 6 Credits: 3

Topic No.	Topic	No. of hours
1.	Analysis of fruits and vegetables products a) Analysis of jam : %soluble solids, pH, % fruit, colour, preservative, detection of adulterants, artificial thickening agent like gelatine, agar and starch	6

	b) Analysis of squash: % TSS,% fruit juice, acidity, colour, preservative c) Analysis of ketchup and sauces: % Acidity, salt, benzoic acid and colour d) Analysis of pickles: salt and benzoic acid	6 3 3
2.	Analysis of non-alcoholic beverages a) Analysis of Tea: Extractives, ash, tannin and crude fiber. b) Analysis of coffee: Moisture, ash, water soluble matter, caffeine, qualitative and % chicory, caffeine in French coffee c) Analysis of carbonated beverages: pH, total sugar, saccharin colour	6 6 6
3.	Analysis of alcoholic beverages: Alcohol content, acidity, specific gravity	3
4.	Analysis of Honey : Moisture, specific gravity, TRS, sucrose, fructose to glucose ratio, adulteration test	3
5.	Analysis of hard boiled confection: sulphated ash, acid insoluble ash, artificial colour	3
6.	Analysis of oil and fats: Iodine value , sap value, RM, P &K Value, acid value, peroxide value, free fatty acids	21
7.	Proximate analysis: Analysis of sev and gathia: moisture, ash, protein, fat, presence of antioxidant	6
8.	Analysis of dehydrated foods: moisture, ash, catalase and peroxidase test	3
9.	Analysis of packaging material a) Testing of corrugated fibre board - Box Dimensions of corrugated board - Grammage of Kraft paper - No. of flutes, heights, etc. b) Determination of wax content of various wax coated packaging material like bread wrapper, Biscuit wrapper etc. c) i)Adhesive laminates: Separation and Grammage ii)Printing ink, characteristics: wrinkle test, alcohol test, scotch tape test	3 3 6

10.	Analysis of Egg	3
	Total	**60**

SEMESTER – IV

(4005) QUALITY CONTROL

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% Weightage
1.	Food attributes like a) Colour b) Size and shape c) Viscosity and consistency d) Texture e) Flavours and their importance in quality control	5	32
2.	Brief outline of methods of determination of these attributes	4	28
3.	In-plant quality control techniques – destructive and non-destructive analysis of food and packaging material	2	28
4.	Statistical quality control- A brief summary	1	
5.	Microbiological quality control	1	
6.	Sensory evaluation of food quality – methodology including the triangular test ranking, hedonic scale, flavour profile	1	
7.	Concept of total quality management and quality assurance	1	12
	Total	**15**	

SEMESTER – IV

(4006) FOOD PLANT SANITATION

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% Weightage
1.	Health hazards through foods	1	12
2.	Personal sanitation	1	6
3.	Insect and rodent control	1	12
4.	Water for food Industries- portability, treatment	2	12
5.	Sanitation of kitchenware and equipment's	2	12
6.	Plant sanitation including sanitization and disinfections of premises	2	12
7.	Effluent disposal	3	12
8.	Significance of Microbial Analysis	3	12
9.	Concept-HACCP	3	10
	Total	**15**	

SEMESTER – VI

(4007) FOOD PLANT SANITATION-II

(Practical's)

Practical Hours/week: 4 Credits: 2

Topic No.	Topic	No. of hours
1.	Extraneous matter and its detection	4
2.	Testing Kitchenware	4
3.	Microbial testing of water	8
4.	Testing quality of ingredients	8
5.	Testing bottled beverages	4
6.	Microbiological report of- i. Milk based food ii. Frozen food iii. Cereal foods iv. Dehydrated foods	16
7.	Determination of biological oxygen demand	4

8.	Determination of Howard Mold count	4
9.	Microbial testing of salad dressing	4
10.	Testing hygiene of food handler	4
	Total	**60**

SEMESTER – IV

(4008) FOOD PACKAGING-I

(Theory)

Theory Hours/week: 1 Credits: 1

Topic No.	Topic	No. of hours	% Weightage
1.	Introduction Functions- Primary, secondary, wholesale packages	2	8
2.	Basic packaging materials Paper Paper board – folding cartons and set up boxes	6	40

	Glass Plastics – introduction		
3.	Coating and laminates	2	12
4.	Forms of packages- Introduction	1	16
5.	Aseptic packaging	1	4
6.	Closure and closure liner	1	4
7.	Packaging of specific food products	2	16
	Total	**15**	

SEMESTER – IV

(4009) SKILLS IN LANGUAGE COMMUNICATION

(Theory)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage

1.	Oral Communication Group Discussion Techniques Paper-reading Interview	7	20
2.	Writing Summarising Extended writing	5	20
3.	Correspondence Complaints about defects in equipment Adjustments Sales letters Collection letters Application letters/Resume	10	40
4.	Reports Description of raw material, equipment, processed product, Microbiological, chemical or organoleptic quality market survey report on a product Performance Evaluation Location and layout of factory Performance evaluation of skilled worker Faults in equipment	8	20
	Total	**30**	

SEMESTER – VI
(4010) ENTREPRENEURSHIP-I

Theory Hours/week: 2 Credits: 2

Section I – Fundamental of Entrepreneurship

Topic No.	Topic	No. of hours
1.	Profile of an Entrepreneur Definition, meaning , importance of an entrepreneur Types of entrepreneurs – spontaneous, motivated, induced Characteristics & qualities of an ideal entrepreneur Motivating factors to be an Entrepreneur	3
2.	Women Entrepreneur Definition, meaning , importance, Functions and Role a women entrepreneur Problems faced by Women Entrepreneur Secrets of the successful of Women Entrepreneur The most powerful women in Indian Business	2
3.	Accessing Entrepreneurial Abilities Creativity – Definition, Meaning , Stages in creative Process Innovation-Definition, Meaning Brainstorming – Creative Group technique Project Work	3
4.	Elements of Office Organization Essential Principles of efficient office organization, filling systems, use of computers, communication tools (FAX, Telephone, Internet, Conjference,etc.)	1
	Section – II Fundamental of Accounting	
1.	Accounting – The Language of Business Basic Accounting terms, Principles, rules, definitions, concepts	6

	Assets and type, liabilities , expenses, losses, income, gains Core concepts – Goodwill, Depreciation, Bad Debts, Capital, Drawing, Bank overdraft Debtors and creditors, Type of Discounts (Trade Discount and Cash Count) Capital and Revenue Expenditure, Shares and Debentures Book – Keeping and Accounting – Definition, nature and Importance Business transaction/ Double Entry system Golden Rules of Accounting/Classification of Accounts/ Analysis of Transaction	
2.	Journal – the book of the first entry Definition & Importance / Journal Entries (With Advanced Concepts)	4
3.	Ledger –the Principal Book of Accounts Definition & Importance / Preparation of Ledger Accounts	1
4.	Cash Book Introduction/ Contra Entry Exercise – Three Columnar Cash Book with cash, Bank and Discount Columns	2
5.	Pretty Cash Book Introduction /Exercise- Analytical Petty Cash Book	1
6.	Trial Balance Definition /Concept	1
7.	Final Accounts Trading Account/Profit and Loss Account/Balance Sheet ' Exercises with Adjustment Entries of Closing stock,0 Depreciation, Bad Debts, Prepaid and Outstanding Expenses and Income	5
	Total	**30**

SEMESTER V

INTERNSHIP

Objective

To integrate NSQF within the Diploma to enhance employability of the students and meet industry requirements. Such students apart from meeting the needs of local

and national industry are also expected to be equipped to become part of the global workforce.

ON JOB TRAINING

Duration = 20 Weeks No. of credits = 20 Marks = 500

Students may be awarded Level Certificate by Food Industry Capacity and Skill Initiative (FICSI) as out-lined in the Table below:

Sr. NO	QP Name	QP Code	NSQF Level	Notional Hours
1	Craft Baker	FIC/Q5002	4	240
2	Dairy Products Processor	FIC/Q2001	5	240

Evaluation criteria for On Job Training

Sr. No.	Criteria	Marks
1.	Log Book	100
2.	Viva	100
3.	Report	100
4.	Student's Presentation	100
5.	Company Feedback	100
	TOTAL	**500**

Semester VI – University Examination

Paper Code	Subjects	L	P/ T	D	TP	TW	P/ V	T	Credits
6001.	Project Work (Pr)	---	20	---	---	50	50	100	10
6002.	Food packaging-II (Th)	2	---	1	50	50	---	100	2
6003.	Bakery Technology (Th)	2	4	1	50	50	50	100	4
6004.	Bakery Technology (Pr)								
6005.	Entrepreneurship-II (Th)	2	---	1	50	50	50	100	2
6006.	Sensory Evaluation Techniques (Pr)	---	4	---	---	50	50	100	2
6007.	Computer skills (Pr)	---	2	---	---	50	50	100	1
	Total	**6**	**30**					**600**	**21**

SEMESTER – VI

(6002) FOOD PACKAGING - II

(Theory)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage
1.	Introduction Principles and objectives of packaging Requirements of various industries – Food, Pharma	1 2	
2.	Packaging materials – Traditional- Jute, Wood, Cotton etc. Plastic and Laminates Metal containers & aerosols, composite containers shrink, sketch and cling wraps Boil- in –bag, retortable pouches	6	20
3.	Forms of packages- II Rigid- cans, drums Semi-rigid-collapsible Flexible- bags, wrappers, pouches Thermoformed – blister, skin packages	5	16
4.	Ancillary packaging materials Adhesive and bindings Cushioning Printing Methods Printing inks Legal requirements Barcoding	4	12
5.	Packaging machinery Form- fill- seal machine Bottle washers and bottling Canning Ultrasonic sealing machine Heat and adhesive sealing	4	12

	Crown corking and cappin		
6.	Packaging testing Paper Plastic Mechanical Testing Al foil Barrier, properties testing Handling, journey, hazard testing Printing tests	3	20
7.	Shelf- life studies	2	8
8.	Packaging design consideration	3	12
	Total	**30**	

SEMESTER – VI

(6003) BAKERY TECHNOLOGY

(Theory)

Theory Hours/week: 2 Credits: 2

Topic No.	Topic	No. of hours	% Weightage
1.	Wheat flour and wheat flour treatments – Grade of flour, constituents of flour – ageing of flour – Tests for flour quality	4	8
2.	Yeast i) Characteristics of yeast ii) Preparation of yeast by (a) Grain method (b) Molasses method iii) Storage conditions of yeast iv) Effect of temperature on yeast	5	8

	v) Precautions to be taken while handling dry yeast and compressed yeast		
3.	Technology of bread making different methods Characteristics of good bread Defects, causes and remedies of bread	3	20
4.	Cakes Different cake making processes Sugar batter method Flour batter method Modified sugar batter method Whipping method Blending method Defects, causes and remedies in cake Importance of baking time and temperature Recipe balancing	5	20
5.	Biscuits Fermented dough biscuits Cookies Cream biscuits Defects in biscuits, causes of curves	2	20
6.	Pastry Short crust pastry Puff pastry Flaky pastry Danish pastry Choux pastry Rough puff pastry Defects, causes and remedies	2	8
7.	Bakery equipment and machinery Different type of Mixers, kneaders and cutters Different types of ovens Packaging machinery for bread and biscuits	3	8

8.	Quality control in bakery industry Quality control of raw materials Quality control of finished products Quality control of packaging materials	4	8
9.	Plant layout of a bakery	2	
	Total	**30**	

SEMESTER – VI

(6004) BAKERY TECHNOLOGY

(Practical)

Practical Hours/week: 4 Credits: 2

Topic No.	Topic	No. of hours
1.	Bread Variety of breads Milk, garlic, masala Hot cross buns Variety of buns (Bread rolls) Variety of pizza	20
2.	Biscuits Hard dough biscuits e.g. Marie Fermented dough biscuits e.g. jeera, cheese etc. Cookies and soft dough biscuits Cinnamon biscuits Tricolour biscuits Madeline's Butter buttons	16
3.	Pastry Flaky pastry Danish pastry Short crust pastry	8
4.	Tarts	8

	Jam tarts Swiss tarts Bake well tarts	
5.	Cakes Sponge cake Angel cake Chiffon cake Variety cakes e.g. Black forest, pineapple Swiss roll/ yole log Genese sponge cake	8
	Total	**60**

SEMESTER – VI

(6005) ENTREPRENEURSHIP-II

Theory Hours/week: 2 Credits: 2

Section I – Genesis of Entrepreneurship

Topic No.	Topic	No. of hours
1.	Starting A Business Acquisition of existing business/ Set up of New Venture/ Franchising	3
2.	Types of Organisations Sole Proprietorship/ Partnership Firm / Co- operative Joint stock company (Private & Public Limited co.)	2
3.	Management Skills Required by an Entrepreneur	3

	Key Management Tools – Planning/ Decision making (Steps and SWOT Analysis) Leadership/ Motivation Techniques and the five levels of Maslow's Hierarchy of Needs	
	Section – II Management of Entrepreneurship Business	
1.	Finance Management Banking – Procedure of opening a Bank account/ Types of Bank accounts/ Type of cheques/ Types of Bank Loans Budgeting – Define Budget, Advantages Type of Budgets (Fixed and Flexible, Short term & Long Term, Cash) Sources of Finance – Long Term, Medium Term, Short Term	4
2.	Production management Factors of production – 4 " M" – Money, Manpower, Machinery, Materials Product life Cycle/ steps for How to increase production by efficient management of factors of production/ Stock Valuation Methods (FIFO, LIFO, Weighted Average) ABC Analysis of Stock	5
3.	Cost Management Cost-Definition, Components of Total costs (Prime cost, Factory Cost, office Cost, Total Cost) Type of Costs (Variable, Fixed , semi-variable) Marginal Costing – Definition, Contribution, P.V. Ratio, Margin of safety Calculations Decision making based on marginal Costing – Product pricing. Make or buy, Continue or close Down of Business Break- Even Analysis – concept and calculation of Break – Even Point Project Work	5
4.	Sales & Marking Management Market Research, sales production tools – Advertising and Publicity – Advantages, Window Display, Sponsorship, Public Relation, Corporate Social Responsibility (CSR), Branching, Family Brand.	4

5.	Human Resource Management Definition/ Functions of Personnel Manager/ Organizational Cultures – Theories/ Consequences of culture clashes/ steps to create Positive and harmonious Culture for Business Employer and Employee Relations – Sources of Conflict / Conflict Resolution methods	4
	Total	**30**

SEMESTER – VI

(6006) SENSORY EVALUATION & TECHNIQUE

(Non-University Examination)

(Practical's)

Practical Hours/week: 4 Credits: 2

Topic No.	Topic	No. of hours
1.	Introduction to sensory analysis	4
2.	Difference tests, paired comparison duo-trio tests, difference from control tests.	4
3.	Difference test, triangle test, two out of five tests	4
4.	Difference test, ranking test, and magnitude estimation	4
5.	Assignment/assessment on difference test	4
6.	Descriptive test, consensus profile	4
7.	Descriptive test, Descriptive profile	4
8.	Descriptive test, free choice	4
9.	Assessment on descriptive test	4
10.	Acceptance test, hedonic rating and multiple sample Ranking for preference	4
11.	Acceptance test, paired comparison (preference test) and repeat paired	4
12.	Acceptance on Acceptance test	4
13.	Computerized sensory evaluation statistical quality control spiderograph	4
14.	Major project – design/ pilot testing	4
15.	Major project- design/ pilot testing and Assessment	4

	Total	**60**

SEMESTER – VI

(6007) COMPUTERS

(Non-University Examination)

(Practical's)

Practical Hours/week: 2 Credits: 1

Topics No.	Topics and Sub-topics	No. of Hours
1	1. **Word processing using advanced features.** 1.1 Create Documents, Saving of document, using Save As functions. , Write/Edit documents using all the features of word processing software, 1.2 Mail Merge, Spell Check, Using synonyms and thesaurus, Bullets and Numbering, Combiningtwo different documents, 1.3 Macro and Clip arts, Indents and Spacing, 1.4 Working with templates, 1.5 Working with different styles 1.6 Working with Master document	2
2	2. **Spread Sheet Software** – 2.1. Understanding the main spreadsheets window, Opening and saving files,Creating and Formatting Excel Worksheet, 2.2. Inserting Data, Different	8

	techniques of moving around the excel worksheet, Selection techniques and typing and editing data in worksheet 2.3. Cell Formatting, Working with column and rows, Copying & Moving cell contents , Rotating cell contents, Working with borders and shading, Different types of number formats, 2.4. Creating own number formats 2.5. working on simple Formulas, Working with all Functions, Pivot Table Functions 2.6. Making Charts and Goal Seek Function, Splitting Windows & Freezing Panes 2.7. Filling numbers in series, Working with header & footer, Data sorting, and filtering 2.8. Printing spreadsheet data.	
3	3. **Presentation software** 3.1. Introduction to Power Point –and its use, Menus(File , Edit ,View , Insert , Format ,Slide Show) , Creating Simple Presentation, Giving animation Effects to slides and objects, giving background to presentation and working with different layouts of slides , 3.2. Opening Saving and Printing a Presentation Using Custom Animation Adding Sound & Animation to slides & objects, 3.3. Inserting Pictures and Clip Art and Slide Transition, Working with Tables in PowerPoint, 3.4. Applying animations and transition effects to slide, Printing, Saving and E-mailing slide show 3.5. Working with Charts in PowerPoint	6
4	**4. Introduction to Graphics Design Software.** 4.1. Introduction to Corel Draw, The	6

	Corel Draw Screen, Toolbar and Using the Property Bar Using Toolbox & drawing basic shapes like square, circle etc. Aligning Objects using Grids, Guidelines and ruler, changing the order of objects &grouping the objects using The Outline Tool – Width, Color and Style 4.2. Applying different Uniform fill, Fountain Fill, Pattern Fill, Texture Fill, Post Script fill and Removing the fill color	
5	**5. Introduction to Data Base** 5.1. Introduction to Relational Database Management System – Relations, tuples and attributes Features Of RDBMS, 5.2. Steps in designing a Table, Data Types, Enforcing Constrains, Input Mask Character Field Level Validation in Table, 5.3. Working with Relationship between Tables 5.4. Running different queries.	6
6	**6. Introduction to C programming** 6.1.Introduction to C programming	2
6	**7. Internet** 7.1. Searching data on Search Engines, 7.2. Create Email IDs, Print Emails, 7.3. Downloading file From Emails attachment, 7.4. Email Attachment, Email Etiquettes, 7.5. Introduction to Google Apps, 7.6. Video Conferencing	2
	TOTAL	30

Reference Books –

1. Computer Manuals provided by college
2. wiki.documentation.org/images/e/e6/WG42-WRITERGuideLO.pdf
3. Computer Fundamental by P.K.Sinha , Wadsworth, Inc

4. Microsoft Office For Windows by Stephen Sagman, Tata McGraw Hill

References :

i. http://www.valo-cd.net/guides/flossmanuals-inkscape.pdf

ii. http://wiki.scribus.net/wiki/images/0/0b/Scribus-manual-sample-3.pdf