

VOCATIONAL COURSE

FOOD PROCESSING TECHNOLOGY

MARKS DISTRIBUTION AT A GLANCE

<u>Phase-I / (C.VOC)</u>						
Marks Distribution						
Paper Code	Title	No. of credits	Hrs. /week	Internal (CcA)	External (SE)	Total
<u>GENERAL EDUCATION COMPONENT</u>						
DVFT101	Communication Skill	2	2	10	40	50
DVFT102	Computer Fundamentals	2	2	10	40	50
DVFT103	Lab- Communication Skill	2	4	-	50	50
DVFT104	Lab- Computer Fundamentals	3	4	-	50	50
<u>SKILL DEVELOPMENT COMPONENT</u>						
DVFT105	Fundamentals of Food and Nutrition	3	2	10	40	50
DVFT106	Principles of food preservation	2	2	10	40	50
DVFT107	Processing Technology of Fruits & Vegetables	2	2	10	40	50
DVFT108	Food Packaging Technology	2	2	10	40	50
DVFT109	Lab- Fundamentals of Food and Nutrition	3	4	-	50	50
DVFT110	Lab- Principles of food preservation	3	4	-	50	50
DVFT111	Lab- Processing Technology of Fruits & Vegetables	3	4	-	50	50
DVFT112	Lab- Food Packaging Technology	3	4	-	50	50
	TOTAL	30	45	60	540	600

SYLLABUS

General Education Components

Phase-I / (C.VOC)

DVFT 101 - Communication Skill

Credits- 2

M. Marks 50 (40+10)

Learning Objectives:

1. To facilitate the students to understand the fundamental of communicative English.
2. To facilitate the students to develop skills of communication in English.

Learning Outcomes:

1. Expression power and communication skill of the students in English will improve.
2. Students will be able to identify the necessities of behavioral and expressive attitudes as per situations.

Unit-I

Grammar: Parts of speech Nouns, Kinds of Nouns, Pronoun, Verb, Adjectives Adverb, Prepositions, Conjunctions and Interjections

Unit-II

Tenses & Articles:

- A. Tenses Present tense, Past tense, Future tense.
- B. Articles Use of A, An, The

Unit-III

Process of Communication:

A Attributes of Communication: Sender, Receiver, Medium, and Channel
Message Feedback.

B Objectives of communication, why communication is necessary?

C Communication in Business

Reference Books:

1. Business Communication, by Urmila Rai & S. M. Rai. Himalaya Pub.
2. Communication Skill for Effective Management by Dr. Anjali Ghanekar. Everest Pub. House.
3. Developing Communication Skill by Krishna Mohan, Meera Banerji. McMillan

DVFT 103 - Lab- Communication Skill

Credits 3

M. Marks 50 (40+10)

Practical based on Communication Skills

Simple conversation , Meeting people, pictorial conversation, identifying objects, handling situation. Vocabulary building Conversation with seniors and peers.

DVFT 102 - Computer Fundamentals

Credits 2

M. Marks 50 (40+10)

Learning Objectives:

1. To facilitate the students to study Instructional Designing theories, basic IT skills using application software tools.
2. To facilitate the students to make functional use of IT skills in teaching – learning process.
3. Students will learn about operating system MS window.
4. Students will gain the information about MS word, MS excel and MS power point.

Learning Outcomes:

1. Students will have command on basic computers and IT skills
2. Students will be able to use computer and internet facilities for their academic and holistic development purpose

Unit-I

Information Concepts and Processing: Evolution of information processing, Data, Information language and communication. Elements of a computer processing system: Hardware-CPU, storage devices and media. VDU, Input-output devices, data communication equipment. Software-System software, Application software.

Operating Systems: Concept as resource manager and coordinator of processor, devices and memory. Command interpreter, typical commands of DOS/ UNIX/ Netware, GUI-Windows.

Computers and Communication: Single user, multi-user, workstation, and client server systems. Computer networks, Network protocols. LAN, WAN, Services offered by Internet.

Unit II

1. Operating system MS Window

-Definition & functions, Basic components of windows, types of icons, taskbar, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel -adding and removing software and hardware, setting date and time, screen saver and appearance.

2. MS-Word

Documentation, Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool

Unit III

MS-Excel - Introduction to MS-Excel, Creating& Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation. Database Management using Excel-Sorting, Filtering, Table, Validation, Goal Seek, and Scenario. 4. MS-PowerPoint: Presentations, Creating, Manipulating &Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds and insertion, Inserting Animated Pictures

Unit IV

Problem analysis, flow charts, decision tables & algorithms. Algorithmic Programming Language: Representation of integers, characters, constants and

variables, arithmetic expressions and their evaluation using rules of hierarchy. Assignment statements, logical constants, variables and expression.

Unit-V

Control structures—sequencing, alteration, iteration, arrays, manipulating vector and matrix. Subroutines and linkage. Data management. Sample I/O statements, Documentation, Debugging. Examples illustrating structured program development methodology. C should be used as the teaching language.

Reference Books:

1. Fundamentals of Information Technology by Chetan Srivastava, Kalyani Publishers
2. Fundamentals of Computers by V. Rajaraman, PHI Publication, IVth Edition.
3. Fundamentals of Programming by Raj K. Jain, S. Chand Publication
4. Let Us C by Yashwant Kanitkar
5. Programming with C - 2nd Edition - Byron Gottfried BVG 106: Practical Assignments Based on Computer Fundamentals-I.
6. Learn Microsoft Office Russell A. Stultz, – BPB Publication
7. Fundamentals of Information Technology, ChetanSrivastva Kalyani Publishers
8. Foundations of Computing, P.K. Sinha and P. Sinha, 2002 First Edition, BPB.

DVFT 104 - Lab Computer Fundamentals

Credits 3

M.Marks 50(40+10)

Practical Assignments Based on Computer Fundamentals

DVFT 105 - Fundamentals of Food and Nutrition

Credits 2

M.Marks 50(40+10)

Learning Objective:

1. Student will enable to understand the importance of nutrient in our daily diet.
2. Student will enable to formulate nutritionally enriched food products as per the requirement.

Learning Outcome:

1. To develop proficiency skill in producing different nutritious food products.
2. Operating & management of balanced diets for different age groups
3. Make different processed food products with quality assurance.
4. Assessment of nutritional status of the women and children.

Unit-I

Basic concept of Food:

Nutrient, Nutrition, Classification of Food, Classification of Nutrients. Food constituents - Definition, occurrence, properties and metabolism of Protein, Carbohydrate and Lipids.

Unit- II

Enzymes - Definition, classification, enzyme kinetics. Browning reactions in foods:

- i. Non enzymic browning: Maillard reaction, browning of ascorbic acid, caramelization of sugars.

ii. Enzymic browning: Definition, mechanism, control measures.

Unit-III

Biochemical changes in foods of plant and animal origin: fruits, vegetables, cereals, pulses, oilseeds, meat, poultry, seafood, dairy and their products)

Unit-IV

Concept of food and nutrition - Elements of nutrition, Food groups and role of nutrients. Energy metabolism - BMR

Unit-V

Recommended dietary allowances, Balanced diet for different age groups (Infancy to old age).

Unit- VI

Malnutrition-Causes, types, symptoms and prevention, Assessment of nutritional status of the community, National nutrition policy

Reference Books:

1. Biochemistry of Foods:- N.A.M. Eskin, H.M. Henderson, R. J. Townsend.
2. Introduction to the Biochemistry of Foods: Z. Berk.
3. Industrial Enzymes: Structure, Function and Applications - Julio Polaina and Andrew P. MacCabe.
4. Food and Nutrition: - M. Swaminathan. 5. Human Nutrition: - S. Mudambi.

DVFT 109 - Lab Fundamentals of Food and Nutrition

Credits 3

M. Mark50(40+10)

1. Qualitative identification of carbohydrates.
2. Estimations of amino acids in foods.
3. Qualitative identification of lipids.
4. Enrichment and fortification of daily diet.
5. Calculation of BMR and body surface area
6. Calculation of energy value of food.
7. Determination of auto oxidative rancidity of fat and oils.
8. Planning and calculation of nutritive value of balanced diet for different age groups.
9. Qualitative & quantitative determination of vitamins.
10. Assessment of nutritional status of an individual by anthropometric method and diet survey.
11. Computation of energy requirement on the basis of physical activity
12. ACU units.



DVFT 106 - Principles of food preservation

Credits 2

M. Marks 50 (40+10)

Learning Objectives:

To acquaint the students with fundamental principles and various techniques of food preservation.

Learning Outcomes:

1. Student will enable to understand different food preservation techniques, process.
2. Student will enable to extend shelf life of different food product by using the various methods of food preservation.

Unit-I

Introduction, sources of food, scope and benefit of industrial food preservation, perishable, non-perishable food, causes of food spoilage. Preservation by salt and sugar – Principle, method, equipment and effect on food quality

Unit-II

Thermal processing methods of preservation – Principle and equipments: Canning, blanching, pasteurization, sterilization, evaporation, etc. Need and principle of concentration, methods of concentration – Thermal concentration, freeze concentration, membrane concentration, changes in food quality by concentration

Unit-III

Food preservation by use of low temperature – Principle, equipments and effect on quality (Chilling, cold storage, freezing etc.)

Unit-IV

Preservation by drying dehydration and concentration – Principle, Methods, equipment and effect on quality : Difference, importance of drying and dehydration

over other methods of drying and dehydration, equipments and machineries, physical and chemical changes in food during drying and dehydration.

Unit-V

Preservation by radiation, chemicals and preservatives: Definition, methods of irradiation, direct and indirect effect, measurement of radiation dose, dose distribution, effect on microorganisms. Deterioration of irradiated foods- physical, chemical and biological, effects on quality of foods. Preservation of foods by chemicals: antioxidants, mold inhibitors, antibodies, acidulants etc. Preservation by fermentation- Definition, advantages, disadvantages, types, equipments

Unit-VI

Recent methods in preservation: Pulsed electric field processing, high pressure processing, Processing using ultrasound, dielectric, Ohmic and infrared heating. Theory, equipments and effect on food quality.

References Books:

1. Food Processing and Preservation- Subbulaksmi G., and UdipiS.
2. Principles of Food Science, Vol. II- G. Borgstron, Mc. Millan Co. Ltd. London.
3. Principles of food preservation Part I& II- Owen R. Fenemma.
4. Food Science- Potter, CBS publishers.
5. Technology of Food Preservation - N.W. Desroiser and N.W. Desrosier
6. Introduction to Food Science & Technology- G.P. Stewart & M.A. Amerine
7. Food Processing Operations Vol. III -M.A. Joslyn and J.J. Heild.
8. Preservation of Fruits and Vegetables- Giridhari Lal, G.S. Siddappa, and G.L. Tondon

DVFT 110 - Lab. - Principles of Food Preservation

Credits 3

M. Marks 50 (40+10)

1. Demonstration of various machineries used in food processing.
2. Demonstration on effect of blanching on quality of foods.
3. Demonstration on canning and bottling of fruits and vegetables.
4. Preservation of food by high concentration of sugar i.e. preparation of jam
5. Preservation of food by using salt e.g. Pickle
6. Preservation of food by using acidulants i.e. pickling by acid, vinegar or acetic acid
7. Preservation of food by using chemicals.
8. Preservation of coconut shreds using humectants.
9. Drying of fruit slices in cabinet drier
10. Demonstration on drying of green leafy vegetables
11. Osmotic dehydration of foods e.g. candy
12. Drying of foods using freeze-drying & spray drying process.
13. Preservation of milk by condensation/concentration.
14. Demonstration of preserving foods under cold v/s freezing process.
15. Preservation of food by fermentation (Sauerkraut, idli, tempeh, curd, dhokla etc.)
16. Visit to any food processing industry/unit.



DVFT 107 - Processing Technology of Fruits & Vegetables

Credits 2

M. Mark50(40+10)

Learning Objectives:

To enable the students to know the post-harvest management systems and processing technologies for preservation of fruits & vegetables and various value added products.

Learning Outcomes:

1. To develop proficiency skill in producing different types of processed fruits & vegetables products.
2. Operating & maintenance the modern processing equipments & machineries
3. To make different processed fruit & vegetable based products with quality assurance and safety.
4. Process of packaging, storing & marketing

Unit-I

An over view of production and processing scenario of fruits and vegetables in India and World. Post harvest management of fruits and vegetables-control of losses in harvesting, and handling operations. Scope of fruit and vegetable preservation industry in India. Present status, constraints and prospects.

Unit-II

Morphology, structure and composition of fruit and vegetable Maturity standards: Importance, methods of maturity determinations, maturity indices for selected fruits and vegetables. Harvesting of important fruits and vegetables. Fruit ripening: chemical changes, regulations, methods.

Unit-III

Storage practices: Modified & Controlled atmospheric storage, hypobaric storage, cool store. Commodity treatments- chemicals, wax coating, pre-packaging. Post

Harvest handling, packaging & transport system for various fruits & vegetables and packaging house operations.

Unit-IV

Overview of principles and preservation methods of fruits and vegetables. Commercial processing of major fruits and vegetables (jam, jellies, marmalade, purees, concentrates, preserve, candy, toffee/bar etc.)

Unit-V

A.

Processing technology for manufacturing of fruit juices, pulp, RTS beverage, nectars, squash, syrup etc.

B.

Processing of Tomato: paste, ketchup, sauce, puree, soup, chutney etc. Drying and dehydration technology of fruits and vegetables: preparation of raisins, anardana, dried fig, dried leafy vegetables, juice powders, flakes, wafers, chips etc. Fermented fruits and vegetables products like sauerkraut, pickles, wines etc. Utilization of By-products and wastes from fruits and vegetables processing industry

Reference Books:

1. Post Harvest Physiology, Handling and Utilization of Tropical and Subtropical Fruits and Vegetable- E. B. Pantastico, AVI Publishing Company, INC.
2. Post Harvest: An Introduction to the Physiology and Handling of Fruits and Vegetables- R.B. Wills, M.B. Mc Glasson, D. Graham, T.L. Lee and E.G. Hall.
3. Post Harvest Technology of Fruits and Vegetables: Handling, Processing, Fermentation and Waste Management Vol. I and II- Verma L. R. and Joshi V.K.
4. Fruit and Vegetable Preservation Principles and Practices -Srivastava R.P. and Sanjeev Kumar

5. Preservation of Fruits and Vegetables-Khader
6. Fruit and Vegetable Preservation -Bhutani R.C.
7. Principles of Fruit Preservation- Morris, Thomas Norman,.
8. Preservation of fruits and vegetables- Giridharilal, G.S. Siddappa and G.L. Tandon.
9. Fruit and Vegetable

DVFT 111 - Lab Processing Technology of Fruits & Vegetables

Credits 3

M. Marks 50 (40+10)

1. Studies on maturity indices of fruits and vegetables.
2. Studies on extension of shelf life.
3. Studies on use of chemicals for ripening of fruits and vegetables
4. Studies on pre-packaging.
5. Studies on physiological disorders - chilling injury of banana and custard apple
6. Canning/bottling of mango/guava/papaya fruits
7. Preparation of fruit jam: apple/mango/guava/ papaya/aonla/ strawberry.
8. Preparation of fruit jelly/marmalade: wood apple/ sweet orange/mandarin/guava/ tamarind.
9. Preparation of fruit preserve and candy
10. Preparation of fruit RTS beverage.
11. Preparation of carbonated beverage.
12. Preparation of fruit squash
13. Preparation of fruit syrup.
14. Preparation of pickle/ mixed pickle
15. Preparation of grape raisin/ anardana/ dried fig etc..
16. Preparation of dried ginger/ amchur/ onion and garlic



DVFT 108 - Food Packaging Technology

Credits 2

M.Marks50(40+10)

Learning Objectives:

To be familiar with different methods and materials used for packaging.

To understand the technology behind packaging.

- **Learning Objectives:**

Students will be able to understand the prevents or reduces product damage and food spoilage, protecting the health of the consumer.

UNIT-I

Introduction to food packaging ,Definition, functions and requirements for effective packaging, packaging criteria, Classification of packaging- Primary, secondary and tertiary packaging, Flexible, rigid and Semi- rigid packaging.

UNIT-II

Materials for food packaging Paper, Glass, Tin, Aluminium: TFS, Polymer coated tin free steel cans, cellophane, plastics-LDPE, HDPE, LLDPE, HMHDPE, Polypropylene, polystyrene, polyamide, polyester, polyvinyl chloride.

UNIT-III

Different forms of food containers Boxes, jars, cans, bottle. Interaction of packages with foods-Global migration of plastics, packaging requirements for various products- fish, meat, spices, vegetables & fruits, canned foods, dehydrated foods.

UNIT-IV

Modern concepts of packaging technology Aseptic packaging, Form–Fill–Seal packaging, Edible Films, Retort pouch packaging, Easy-Open–End, Boil–In-Bags,

Closures, tetra-pack, vacuum-packaging, MAP & CAP, Hyper baric storage, insect resistant packaging, intelligent packaging.

UNIT-V

Food packaging Laws & Specifications Quality testing of packaging materials Paper & paper boards-thickness, bursting strength, grammage, puncture resistance, Cob's test, tearing resistance. Flexible packaging materials (plastics)-yield, density, tensile strength, elongation, impact, resistance, WVTR, GTR, Overall Migration Rate, seal strength. Transportation hazards and testing., Oxygen interactions, moisture interchanges and aroma permeability.

Reference books:

1. Cruess, W.V. Commercial Fruit & Vegetable Products. Allied Scientific Publishers, New Delhi. 2003
2. Davis, E.G. Evaluation of tin & plastic containers for foods. CBS Publishers, New Delhi. 2004
3. Gopal T.K.S. Seafood packaging, CIFT, Matsyapuri Cochin,2007
4. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.
5. Sacharow, S., Griffin, R.C. Food Packaging. AVI Publishing Company, West Port, Connecticut. 2000
6. Srilakshmi, B. Food Science. New Age International Publishers, New Delhi, 2003

DVFT 112 - Lab- Food Packaging Technology

Credits-3

M.Marks50(40+10)

1. Identification of different types of packaging and packaging materials
2. Identification of different types of packaging and packaging materials.
3. To perform different destructive and non- destructive test for glass containers.
4. Determination of tensile strength of given material.
5. Determination of tearing strength of paper.
6. Determination of water vapour transmission rate.
7. Determination of drop test of food package.
8. Visit to food packaging industries.
9. To demonstrate vacuum and shrink packaging.
10. Demonstrate the intelligent packaging.
11. Measurement of thickness of packaging materials.
12. Determination of wax weight.
13. To perform grease-resistance test in plastic pouches.
14. Determination of bursting strength of packaging materials.
15. Demonstration of can-seaming operation.
16. Testing of chemical resistance of packaging materials .
17. Show videos of latest trends in packaging consulting websites.



Phase-II (D.VOC)						
Marks						
Paper Code	Title	No. of credits	Hrs. /week	Internal (CcA)	External (SE)	Total
GENERAL EDUCATION COMPONENT						
DVFT201	Personality Development	2	2	10	40	50
DVFT202	Marketing and Retail Management	2	2	10	40	50
DVFT203	Lab-Personality Development	3	4	-	50	50
DVFT204	Lab-Business Communication	3	4	-	50	50
SKILL DEVELOPMENT COMPONENT						
DVFT205	Food Chemistry	2	2	10	40	50
DVFT206	Food additives	2	2	10	40	50
DVFT207	BAKERY AND CONFECTIONERY TECHNOLOGY	2	2	10	40	50
DVFT208	FOOD PRODUCT DEVELOPMENT	2	2	10	40	50
DVFT209	Lab- Food Chemistry	3	4	-	50	50
DVFT210	Lab- Food additives	3	4	-	50	50
DVFT111	Lab- BAKERY AND CONFECTIONERY TECHNOLOGY	3	4	-	50	50
DVFT212	Lab- FOOD PRODUCT DEVELOPMENT	3	4	-	50	50
	PROJECT	-	-	-	-	100
	TOTAL	30	45	60	540	700

SYLLABUS (Phase II)

GENERAL EDUCATION COMPONENT

DVFT 201 - Personality Development

Credits 2

M. Marks 50(40+10)

Learning Objective:

The objective of the subject is bring about personality development with regard to the different behavioral dimensions that have far reaching significance in the direction of organizational effectiveness.

Learning Outcome:

Students will be able to create awareness in the participants with regard to the different aspects of Interpersonal relations based on the ideas envisaged in Transactional Analysis and their relative significance in the context of the functional effectiveness of organizations.

Unit-I

Self- Analysis SWOT Analysis, Who am I, Attributes, Importance of Self Confidence, Self Esteem.

Unit-II

Creativity out of box thinking, Lateral Thinking.

Unit-III

Attitude Factors influencing Attitude, Challenges and lessons from Attitude, Etiquette.

Unit-IV

Motivation Factors of motivation, Self-talk, Intrinsic & Extrinsic Motivators.

Unit-V

Goal Setting Wish List, Smart Goals, Blue print for success, Short Term, Long Term, Life Time Goals. Time Management Value of time, Diagnosing Time Management, Weekly Planner to do list, Prioritizing work.

Reference Books:

1. SOFT SKILLS,(2015), Career Development Centre, Green Pearl Publications .
2. Covey Sean, Seven Habits of Highly Effective Teens, New York, Fireside Publishers, (1998).
3. Carnegie Dale, How to win Friends and Influence People, New York: Simon & Schuster, (1998).
4. Thomas A Harris, I am ok, You are ok , New York-Harper and Row, (1972)
5. Daniel Coleman, Emotional Intelligence, Bantam Book, (2006)

DVFT 203 - Lab- Personality Development

Credits 3

M. Marks 50 (40+10)

1. Personality Development ASSESSMENT
2. A practical and activity oriented course which has continuous assessment for marks based on class room interaction, activities etc.
3. Extempore.
4. Technical Topic Presentation

DVFT 202 - Marketing and Retail Management

Credits 2

M. Marks 50 (40+10)

Learning Objectives:

Students will learn about the marketing process and strategic planning of food processing

- Industries in the world. Students will gain information about the marketing environment, consumer markets, and consumer
- Buyer behavior, rural and urban industrial marketing. Students will gain knowledge about role of advertising, promotion, product and service
- Strategies. Student will develop understanding about product, brand and sales management

Learning Outcomes:

Students will be enable:

1. To understand and demonstrate the use of basic and advanced knowledge of marketing techniques that today's technology demands.
2. would have the opportunity to understand about product ,buyer behavior and sales management.

Unit – I

Marketing in FPI in the global world, strategic planning and the marketing process, the marketing environment, consumer markets and consumer buyer behavior
Rural Marketing, industrial Marketing

Unit – II

Marketing strategy – Overview, advertising and promotion, Product and services strategy, Pricing products, Distribution and supply chain management channels, Direct and online marketing, competitive strategies

Unit – III

Product and Brand Management, consumer buying behavior, Sales Management and sales promotion,

Unit – IV

Place of Retailing in the Marketing Mix, Trends in retailing, Communication and Customer Relations, Managing People at Work - Recruitment and Motivation, Total Quality Management, product development, globalization in food industries .

Unit – V

Food product handling and transportation

Reference Books:

1. Robert Reeder, Edward G, Industrial Marketing – Analysis, Planning and Control.
2. Krishna K. Havaladar, Industrial Marketing ,Tata McGraw Hill
3. Jagdish Sheth & G shainesh, Customer Relationship Management, 4. Michael Levy, Retailing Management.
5. Swapna Pradhan, Retailing Management – Text & Cases.
6. Gibson Vedamani, Retail Management.
7. Walker and Larreche, Marketing Strategy – Boyd, McGraw Hill Irwin
8. David Aaker, Strategic Market management, John Wiley & sons
9. George Belch, San Diego University Michael Belch, Advertising and Promotion: An Integrated Marketing Communications Perspective, San Diego University
10. Rajeev Batra, John G. Myers, David A. Aaker, Advertising Management.

DVFT 204 - Lab Marketing and Retail Management

Credits 3

M. Marks 50(40+10)

1. To collect different branded food items and their qualitative and quantitative comparison.
2. To conduct survey and prepare a report on consumer behavior with respect to a particular product.
3. To study parameters of customer satisfaction.
4. To plan for industrial unit set up for a product.
5. To study advantages & disadvantages of on line shop

DVFT 205 – Food Chemistry

Credits 2

M. Mark50 (40+10)

Learning Objectives:

1. To acquaint various functional chemical constituents of food.
2. To build a relationship between the dynamic forces of food and the dynamic forces of digestion and growth.

Learning Outcomes:

1. Students will be able to understand the basic concept, functions, and component of food.

Unit-I

Introduction to chemistry of foods composition and factors affecting foods, chemistry of water, water activity, moisture determination.

Unit-II

Carbohydrates Properties and classification, starch, cellulose, pectic substances, enzymes and its use in foods, gel formation and starch degradation, dextrinization, Browning reactions – Enzymatic & Non-enzymatic browning.

Unit-III

Proteins Classification, physical and chemical properties of proteins and amino acids, confirmation, functional properties, hydrolysis of proteins, changes of proteins during processing.

Unit-IV

Oils and Fats Classification, composition, physical and chemical properties, hydrolysis, hydrogenation, rancidity and flavor reversion, winterization, refining of oils, rendering, emulsions.

Unit-V

Vitamins & Minerals Classification- Fat soluble & water soluble, structure, sources, functions, causes for losses of vitamins in foods, bioavailability. Minerals, classifications, sources, functions.

Reference Books:

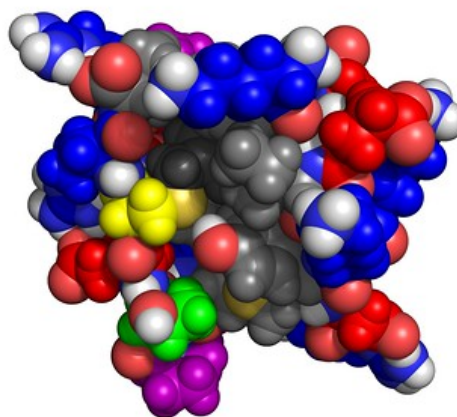
1. Campbell, Campbell, M K and Farrell, S O-Biochemistry 5th edition-international student, 2006
2. Damodaran,S., Parkin , K L.,Fennema, O R., Fennema's Food Chemistry- 4th edition, CRC press Taylor and Francis Group, New York 2008.
3. Fennema, O R. -Food Chemistry 3rd edition, Marcel Dekker Inc, New York., 1996.
4. Manay, N.S, Shadaksharaswamy, M., Foods
5. Meyer, L H-Food Chemistry. CBS publishers & distributors, New Delhi. 2002
6. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.
7. Srilakshmi, B. Food Science (3rd edition), New Age International (P) Limited Publishers, New Delhi, 2003.

DVFT 209 - Lab- FOOD CHEMISTRY

Credits 3

M. Marks50(40+10)

1. Qualitative and Qualitative tests for carbohydrates Qualitative tests for proteins.
2. To estimate the nutrients in different food samples.
3. Standardization of Solutions:
 - I. Standardization of Fehling's solution.
 - II. Standardization of Sodium hydroxide with standard oxalic acid
4. Estimation of Sugar Solutions:
 - I. Estimation of Glucose by Lane and Eynon's method.
 - II. Estimation of Sucrose by Lane and Eynon's method.
 - III. Estimation of Aldose by Willstalter's Iodometric titration
 - IV. Estimation of starch.
5. Estimation of Protein Kjeldhal method Biuret method Lowry's method
6. Estimation of Vitamin. Estimation of vitamin C



DVFT 206 Food Additives

Credits 2

M. Marks 50(40+10)

Learning Objectives:

1. To attain knowledge regarding the use of additives in the food industry, laws related
2. To food additives and to prevent the involuntary infringement of analytical procedures

Learning Outcomes:

Students will be able to understand the knowledge of food additives.

Unit-I

Introduction, Food additives, definition, objectives, functional classification, natural and synthetic additives, health and safety aspects of food additives

Unit-II

Major Food Additives, Preservatives- class I&II, antioxidants, Sweeteners- natural and artificial, permitted food colours- natural and artificial, Food flavors – natural and artificial, Stabilizers and thickeners

Unit-III

Minor Food Additives , Aerating agents, Antistaling agents, Bodying agents, Clouding agents, Curing agents, Clarifiers, Dietary supplements, Dietary fibre, Emulsifiers, Enzymes, Fat replacers, Leavening agents, Surfactants, Tenderizers, Texurizers, Thickeners, Viscosity modifiers, Whipping agents

Unit-IV

Food Laws and Standards , Food standards - Voluntary and mandatory food laws and Food Safety and Standards Act of India, 2006

Unit-V

Permitted Levels Permitted level of food additives, present status of various food additives, controversial food additives, GRAS

Reference books:

1. Manay, N.S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
2. Meyer, L H-Food Chemistry. CBS publishers & distributors, New Delhi. 2002.
3. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.
4. Srilakshmi, B. Food Science (3rd edition), New Age International (P) Limited Publishers, New Delhi, 2003.

DVFT 210 - Lab- Food Additives

Credits 3

M. Marks50(40+10)

1. Estimation of preservatives and their effects in foods.
2. Estimation of non nutritive sweeteners and their effect in foods
3. Estimation of effects of antioxidants usage in foods.
4. Extraction of essential oils.
5. Use of oleoresins in foods.
6. Observation of the effect of anticaking agents in foods.
7. Estimation of Thickeners and their effects in foods.
8. Use of Acidulants in foods and their effects.
9. Estimation of Colors in foods.
10. Detection/Estimation of adulterants in some foods



Reference Books:

1. ISI hand book of food analysis
2. Hand book of analysis and quality control for fruit and vegetable products, by S. Ranganna, II Ed., Tata McGraw Hill Publishing Co. New Delhi.
3. Official Method of analysis of AOAC

DVFT 207 - BAKERY AND CONFECTIONERY TECHNOLOGY

Credits 2

M. Marks50(40+10)

Learning Objectives:

1. To impart basic and applied technology of baking & confectionary
2. To acquaint with the manufacturing technology of bakery and Confectionary products.

Learning Outcomes:

Students will be able to:

1. Processing methods used in baking and confectionery industries
2. To know about the various types of food products made using baking technology
3. To know about the importance of each ingredient in the bakery and how it effects the overall product and its sensory and quality parameters.
4. To be able to start a small scale bakery and confectionery unit

Unit – I

Introduction to bakery and confectionery industry - Importance of bakery and confectionery in food industry - Important cereals used in bakery and confectionery

Unit -II

Primary processing equipments used in Bakery and Confectionery - Flour Mill, mixer, molding machine, balance, packing machines, measuring glass, moulds, knives, extruder, oven

Unit – III

Flour for the bakery products - Types of flours - Qualities of flour for the production of bakery items - Availability of starch in different grains

Unit – IV

Bread - Principle involved in bread production - Different types of breads and their uses - Ingredients used in bread production

Unit -V

Cake & Biscuit processing of cake and biscuit- Ingredients, role of ingredients, development of batter, baking, packing.

Reference Books:

1. W.P. Edwards: Science of Bakery Products.
2. "Bakery Products Science and Technology", Zhou. W, HuiY, H; (2014),
3. Baking Science & Technology" Vol.1 Fourth Edition, Sosland Publications.
Stanley P. Cauvain, Linda S. Young, (2008)

DVFT 211 Lab - BAKERY AND CONFECTIONERY TECHNOLOGY

Credits 3

M.Marks50(40+10)

1. Manufacture of different types of cakes:

Sponge Cake

Butter Cake,

Apple Cake

Chocolate Butter Cake

Swiss Roll

Lavoche

Christmas Fruit Cake

Puffs.



2. Manufacture of different types of biscuits:

Glucose Biscuit

Sugar Free Biscuit

Coconut Biscuit

Butter Biscuit

Dough Nuts

Almond Anise Biscuit

Masala Biscuits

Press Cookies

3. Manufacture of different types of bread:

Maida Bread

Atta Bread

Masala Bread

Bread Loaf

Panatoni Bread

Focaccia Bread.

DVFT 208 - FOOD PRODUCT DEVELOPMENT

Credits 2

M.Marks 50 (40+10)

Learning Objectives:

1. To learn various processing aspects of food products having economic importance.
2. To learn prepare indian dishes,sweets,snacksand tandoor dishes.

Learning Outcomes:

1. Students will be more confident to prepare and present all type of Indian and continental dishes.
2. The students will be able to for self-employment, establish a hotel or to set up a restaurant.

Unit – I

Origin of hotel industry Importance of kitchen in Hotel & Catering establishments Aims and objectives of Cooking Classification of raw materials, preparation of ingredients. Methods of mixing foods, effect of heat on various foods, weighing and measure, texture of food, Culinary terms.

Unit – II

Methods of cooking with special Application to meat, fish, vegetables, cheese, pulses and egg. Conventional and non-conventional methods of cooking, solar cooking, microwave cooking, fast food operation.

Unit – III

Balancing of recipes, standardization of recipes, standard yield, maintaining recipe files. Menu planning, portion control, brief study of how portions are worked out. Invalid cookery. Purchase Specifications, quality control, Indenting and Costing

Unit – IV

NUTRIENTS and BALANCED DIET, conserving nutrients during Storing, During Food Preparation (Pre-cooking e.g. Washing, Peeling, Cutting, Chopping, Slicing, Pounding, Grinding, Soaking, Sprouting, Fermentation, Mixing) During Cooking, BALANCED DIET Definition and its importance Factors Affecting Balanced Diet (Age, Gender and Physiological state)

Unit- V

Menu planning Nutritionally balanced meals as per three food group system. Factors affecting meal planning Calculation of Nutritive value of dishes and meals.

food safety standards authority of INDIA (FSSAI) Introduction to FSSAI, Role of FSSAI, FSSAI compliance.

Reference books:

1. Manay, N.S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
2. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000
3. Srilakshmi, B. Food Science (3rd edition), New Age International (P) Limited Publishers, New Delhi, 2003.

DVFT 212 Lab - FOOD PRODUCT DEVELOPMENT

Credits 3

M.Marks 50 (40+10)

1. Prepare and Present Indian dishes like Rice Varieties, Dal Varieties, Indian bread, Vegetables and Non-Vegetarian.
2. Prepare and Present Indian Sweets and Snacks
3. Prepare and Present Tandoor dishes.
4. Prepare and Present festival menus.
5. Prepare and Present Sauces, Soups and Pastas
6. Prepare and Present Continental dishes of Fish, Poultry and other meat with accompaniments.
7. Prepare and Present Chinese Soups, Noodles and Rice Varieties etc.

