



**SCHOOL OF VOCATIONAL STUDIES & APPLIED SCIENCES
GAUTAM BUDDHA UNIVERSITY
DEPARTMENT OF FOOD PROCESSING AND TECHNOLOGY
GAUTAM BUDH NAGAR, GREATER NOIDA,
UTTARPRADESH, 201312**

POST GRADUATE DIPLOMA IN FOOD SCIENCE & TECHNOLOGY (FST)

CHOICE BASE CREDIT SYSTEM

WITH EFFECTIVE FROM 2021-2022 ONWARDS

POST GRADUATE DIPLOMA IN FOOD SCIENCE & TECHNOLOGY (FST)

Significance and Objective of the course:

Food Science and Technology course is designed in such a way that it helps students and professionals explore new food sources, discover new ways to formulate processed foods safe and devise new ways to process, store, preserve and distribute food. The PG Diploma is intended for postgraduates in Science/ Agriculture/ Food Science or Allied Disciplines contemplating a career in Food Science & Technology.

Future career prospects

Food Technologist can work in various parts of the economy but most especially agro-allied industries, food processing/production, and research organizations. They can expect to find employment in the food industry (both national and international), research institutes and government agencies in areas such as food manufacturing, food safety, food analysis, brewing, cereals and baking, dairy products, minimally processed fruits and vegetables, food additives, product development, sensory evaluation and winemaking.

Duration of the Course: One year (2 semester)

Eligibility for Admission:

- Graduation in Science with Chemistry/ Bio-chemistry/Biotechnology /Microbiology/ Life Science
- Degree in allied sciences like Agriculture / Food Science and Technology / Nutrition/Post Harvest Technology / Home Sciences/ Life Sciences /Horticulture / Dairy Technology / Veterinary / Fisheries / Hotel Management and Catering / Hospitality Management etc.
- Art graduate with 3 year experience in Food Processing/ Food Quality Control/ Hotel Management (food preparation/ food catering)

Evaluation Criteria:

Title of the Paper	Marks	Evaluation
Post Graduate Diploma in Food Science & Technology (FST) (Theory) – Each Paper	100	<ul style="list-style-type: none">• Internal Assessment – 30 marks• External Examination – 70 marks
Post Graduate Diploma in Food Science & Technology (FST) (practical's) – Each Practical	100	<ul style="list-style-type: none">• Performance at the time of examination – 60 marks.• Record – 20 marks• Viva – 20 marks
Project Work	100	<ul style="list-style-type: none">• Dissertation – 60 marks• Presentation – 20 marks• Viva – 20 marks

Course Fees: Rs. 35,000/- [Per Semester]

Intake Capacity: 30 students

Course Structure:

Total Credits: 47

Theory: 28 credits,

Practical work & Project work: 19 credits

Department of Food Processing and Technology
Course Structure for PG Diploma in Food Science & Technology (FST)
Duration -1 Year (2 Semester)
(Effective from Session 2021 Onward)
Semester I

S. No.	Subject Code	Courses	Course Type	L	T	P	Credits
THEORY							
1	FPD-401	Food Chemistry and Analysis	C	3	0	0	3
2	FPD-403	Food Microbiology	C	3	0	0	3
3	FPD-405	Principles of Food Processing & Post Harvest Technology	C	4	0	0	4
5	FPD-407	Food Engineering & Preservation	C	4	0	0	4
6	FPD-409	Food Laws and Standards	C	4	0	0	4
7	BS 101	Human Values & Buddhist Ethics	C	2	0	0	2
PRACTICALS							
8	FPD-411	Food Chemistry and Microbiology Lab	C	0	0	8	4
9	FPD-413	Food Processing and Engineering Lab	C	0	0	8	4
Total				20	0	16	28
Total Contact Hours				36			

Department of Food Processing and Technology
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Semester- II

S. No.	Subject Code	Courses	Course Type	L	T	P	Credits
THEORY							
1	FPD-402	Elective I	C	4	0	0	4
	FPD-404	Elective II	C	4	0	0	4
2	FPD-406	Seminar	-	0	0	1	1
3	FPD-408	Industrial Visit /Academic Visit/Site Visit	-	-	-	-	2
4	FPD-410	Project Report and Viva Voce	-	0	0	8	8
	Total			8	0	8	19
	Total Contact Hours			16			

Total Credits 47

LIST OF ELECTIVE SUBJECTS:

Elective I:

1. Dairy Technology
2. Meat, Fish and Poultry Technology
3. Fermentation Technology

Elective II:

1. Fruits and Vegetable Technology
2. Technology of Cereals, Pulses and Oilseeds
3. Bakery Technology

Course Structure for PG Diploma In Food Science & Technology (FST)

Duration -1 Year (2 Semester)

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Semester-I

FPD-401 Food Chemistry and Analysis (3+0+0) (12 Hour)

UNIT-I

Food chemistry: Introduction to Food Science, Scope, introduction, definition and importance of food chemistry. Classification, structural, analytical, nutritional and functional properties of carbohydrates, protein and lipids in foods. Types of fibers and its constituents, soluble fibers, insoluble fibers and their important functions. Proteins and Enzymes, egg and meat.

UNIT-II (10 Hour)

Water activity and its impact on shelf life of food. Chemistry and stability of vitamins and minerals during processing. Food additives, emulsion and emulsifier. Enzymatic and non-enzymatic browning in Food. Enzymes in foods, and food industry,

UNIT-III (10 Hour)

Sampling techniques. Fundamental principles, spectral behavior, UV-Visible spectroscopy, Atomic absorption spectroscopy, Fluorescence spectroscopy, Emission spectroscopy, Mass-spectroscopy, IR.

UNIT-IV (8 Hour)

Food Analysis: Physical and Chemical Analysis of Foods, Food from Plant Sources, Food from animal Sources Sensory Evaluation of Food Products, Waste Management in Food Processing Industry

UNIT-V (8 Hour)

Special techniques: Thermal methods in food analysis and Texture measurement techniques, Dough rheology, Hunter-Lab ColorFlex, Polarimetry, Refractometry.

SUGGESTED READINGS:

1. Fennema, O.R. Ed. 1976. Principles of Food Science: Part-I Food Chemistry. Marcel Dekker, New York.
2. Bamji MS, Rao NA & Reddy V. 2003. Textbook of Human Nutrition. Oxford & IBH.
3. Leo ML. 2004. Handbook of Food Analysis. 2nd Ed. Vols. I-III.
4. Linden G. 1996. Analytical Techniques for Foods and Agricultural Products. VCH.
5. Nielsen S. (Eds.). 1994. Introduction to Chemical Analysis of Foods. Jones & Bartlett.
6. Pomrenz Y & Meloan CE. 1996. Food Analysis - Theory and Practice. 3rd Ed. CBS.
7. Ranganna S. 2001. Handbook of Analysis and Quality Control for Fruit and Vegetable Products. 2nd Ed. Tata-McGraw-Hill.

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Semester I

FPD-403 Food Microbiology (3+0+0)

UNIT- I

(12 Hour)

Development and scope of Microbiology. Introduction to food microbiology: Classification of microbes, Types of microorganism normally associated with food- mold, yeast, and bacteria. Importance of microorganisms in food. Primary sources of microorganisms in food. Growth curve. Parameters affecting the growth of microorganisms.

UNIT- II

(12 Hour)

Biochemical changes caused by micro-organisms, deterioration of various types of food product, Contamination of foods- fruits, vegetables, cereals, milk, meat, eggs and canned foods during handling and processing. Fermented and microbial foods: fermented milk and milk products, fermented fruits and vegetables, fermented meat and fish products, fermented beverages (beer, vinegar and wine), single cell protein.

UNIT- III

(12 Hour)

Heat Resistance of microorganisms and spores. Thermal destruction of microorganism. Microbiology of food preservation by heating process, irradiation, low temperature storage, chemical preservatives, high-pressure processing, control of water activity.

UNIT- IV

(12 Hour)

Foods microbiology and public health - Types of food poisonings, important features and control; Overview of algal, fungal and viral food borne illnesses. Disinfected agents. Hurdle Technology and its applications

SUGGESTED READINGS:

1. Jay J.M. 1986. Modern Food Microbiology. 3rd Edn. VNR, New York.
2. Robinson, R.K. Ed. 1983. Dairy Microbiology. Applied Science, London.
3. Banawart GJ. 1989. Basic Food Microbiology. 2nd Ed. AVI Publ.
4. Frazier J & Westhoff DC. 1988. Food Microbiology. 4th Ed. McGraw Hill.
5. Jay JM, Loessner MJ & Golden DA. 2005. Modern Food Microbiology. 7th Ed. Springer.
6. Ray B. 2004. Fundamentals of Food Microbiology. 3rd Ed. CRC.

Course Structure for PG Diploma in Food Science & Technology (FST)
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Semester-I

FPD-405 Principles of Food processing and Post-harvest Technology (4+0+0)

UNIT-I **(12 Hour)**

Scope and importance of food processing. Principles and methods of food processing and preservation: Canning, Irradiation, Extrusion cooking, Dielectric heating and fermentation. Use of Microwave Energy in Foods: Theory of microwave heating, dielectric properties of food materials, working principle of magnetron.

UNIT-II **(12 Hour)**

High Pressure Processing Concept, equipments for HPP treatment, its application in food processing. Ultrasonic processing: Properties of ultrasonic, application of ultrasonic as processing techniques. Newer techniques in food processing: Application of technologies of high intensity light, Ohmic heating and IR heating.

UNIT-III **(12 Hour)**

Importance and scope of post-harvest management of fruits and vegetables in Indian economy, Pre-harvest factors affecting post-harvest quality, post-harvest losses. Maturity indices: Physical and chemical indices of fruit maturity, crop maturity and ripening.

UNIT-IV **(12 Hour)**

Principles of Post-harvest treatments, Post-harvest technology for cereals, legumes, oilseeds, vegetable and spices (cleaning, grading, milling), Hydrothermal treatment & conditioning of grains, Rice parboiling-systems, Drying principles, Crop Drying methods. Minimal processing.

UNIT-V **(12 Hour)**

Food Packaging: Packaging functions, Packaging materials, Degradable packaging polymers, CA & MA, Innovation in food packaging (active, passive, intelligent), Quality changes during storage of packaged foods, sustainable packaging, packaging waste management.

SUGGESTED READINGS:

1. Sahay KM & Singh KK. 1994. Unit Operation of Agricultural Processing.
2. Heldman DR & Singh RP. 1995. Food Process Engineering. AVI Publ.
3. Rao. D.G, Fundamentals of food engg, PHI publ
4. Fellows PJ. 2005. Food Processing Technology: Principle and Practice. 2nd Ed. CRC.
5. Potter NN & Hotchkiss 1997. Food Science. 5th Ed. CBS.
6. Ramaswamy H & Marcotte M. 2006. Food Processing: Principles and Applications. Taylor & Francis.

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Semester-I

FPD 407 Food Engineering & Preservation (3+0+0)

UNIT-I **(14 Hour)**

Aim and Objective: Aim and objectives of preservation and processing of foods, degree of perishability of natural foods, Quality deterioration and spoilage of perishable foods, Water Activity and its significance in food preservation, intermediate moisture foods, types of food spoilage, viz. microbiological, enzymatic, chemical, physical and their effects on food quality

UNIT-II **(12 Hour)**

Low temperatures Preservation: Storage of foods at chilling temperature, applications and procedures, controlled and modified atmosphere storage of foods, post storage handling of foods. Freezing process, slow and fast freezing of foods and its consequences etc. Technological aspects of pre-freezing, Actual freezing, frozen storage and thawing of foods, IQF.

UNIT-III **(10 Hour)**

Basic concept of fluid flow, heat transfer, mass transfer and its application in food processing, Concept of thermal process evaluation – sterilization and pasteurization, Extrusion Cooking.

UNIT-IV **(12 Hour)**

Definitions and classifications of chemical Preservatives in food. Preservation by fermentation and irradiation; technological aspects and applications of sugar and salt, antimicrobial agents, Irradiation of foods type of radiations, Changes induced by radiations, interaction of radiation with living organisms. Radiated food safety.

UNIT-V **(12 Hour)**

Cleaning - Types, aims of cleaning, methods of cleaning- dry, wet and combination methods. Dry cleaning methods: screening, aspiration, magnetic cleaning and abrasive cleaning. Wet cleaning methods: soaking, spray washing, flotation washing and ultrasonic washing. Sorting and Grading - Advantages of sorting and grading, grading factors, methods of sorting and grading.

Size Reduction: principles and laws of size reduction, equipment selection, Particle size analysis.

SUGGESTED READINGS:

1. Sahay KM & Singh KK. 1994. Unit Operation of Agricultural Processing.
2. Heldman DR & Singh RP.1995. Food Process Engineering. AVI Publ.
3. Rao.D.G, Fundamentals of food engg,PHI publ.
4. Fennema O.R. Ed. 1985, Principles of Food Science: Part-II Physical Principles of food Preservation. Marcel Dekker, New York.
5. Brennan JG, Butter JR, Corell ND & Lilly AVE. 1990. Food Engineering Operations. Elsevier.
6. Fellows P. 1988. Food Processing Technology. VCH Ellis Horwood.
7. Singh RP & Heldman DR. 1993. Introduction to Food Engineering. Academic Press.



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Semester I

FPD 409 Food Laws and Standards (4-0-0)

UNIT-1 **(14 hour)**

Introduction, concept of food safety and standards (FSSAI), food safety strategies. Food hazards and contaminations - biological, chemical and physical factors. Prevention and control of microbiological and chemical hazards.

UNIT-2 **(12 hour)**

Indian Food Regulatory Regime (Existing and old), PFA Act and order, Additives, Contaminants and Pesticide Residue. Essential Commodities Act, 1955, Global Scenario, Codex Alimentarius, Legal Metrology act, Weight and Measurement act

UNIT-3 **(14 hour)**

International Food Standards. WTO: Introduction to WTO Agreements: SPS and TBT Agreement, Export (Quality Control and Inspection) Act, 1963. BIS Other product specific standards; AGMARK. FTDR Act, 1992 and Foreign Trade Policy, Customs Act and Import Control Regulations.

UNIT-4 **(08 hour)**

Risk assessment studies: Risk management, risk characterization and communication. Food Safety and Standard Act, 2006,

UNIT-5 **(12 hour)**

Voluntary Quality Standards and Certification GMP, GHP, HACCP, GAP, Good Animal Husbandry Practices, Good Aquaculture Practices, ISO 9000, ISO 22000, ISO 14000, ISO 17025, PAS 22000, IFS. Halal & Kosher Standard.

SUGGESTED READINGS:

1. Singal RS, Handbook of indices of food quality and authenticity; Woodhead Publ. Cambridge, UK.
2. Shapton DA, Principles and practices of safe processing of foods; Butterworth Publication, London.
3. Winton AL, Techniques of food analysis; Allied Science Publications New Delhi.
4. Pomeranze Y, Food analysis - Theory and Practice; CBS Publications, New Delhi.
5. Jacob MB, The chemical analysis of foods and food products; CBS Publ. New Delhi
6. FSSAI website: www.fssai.gov.in

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Semester-I

FPD-411 Food Chemistry and Microbiology Lab Practical (0-0-4)

1. Introduction to basic microbiology, laboratory practices.
2. Cultivation and sub-culturing of Microbes.
3. Direct microscopic examination of foods.
4. Estimation of total microbial count of yeast and molds.
5. Estimation of total microbial bacterial plate count of food sample by direct microscopic and SPC method.
6. Assessment of air using Surface Impingement method.
7. Detection of efficacy of surface sterilisation using swab and Rinse method.
8. Enumeration of Coliforms and indicator organisms (Most Probable Number)
9. Staining Techniques
10. Determination of moisture in a given food sample.
12. Determination of protein and carbohydrates in a given food sample.
13. Determination of ash in a given food sample.
14. Determination of crude fat in a given food sample
15. Estimation of acidity of given food sample/beverage
16. Estimation of total non-reducing and reducing sugars.
17. Estimation of vitamin C in given food sample.
18. Determination of diastase enzyme activity
19. Determination of pigments in a given food sample.

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Semester-I

FPD-413 Food Processing and Engineering Lab

1. Demonstrates The Presence of Lipids In Common Foods
2. Demonstrates The Importance of Pectin In Jelly Making.
3. Experiment Demonstrates How Temperature Influences Taste.
4. Experiment Is To Demonstrate The Presence Of Iron In Breakfast Cereals.
5. Experiment Demonstrates The Effect Of Pickling On Preservation Of Food.
6. This Experiment Demonstrates How To Make Mayonnaise, A Common Food Emulsion.
7. Blanching And Freezing Of Foods
8. Study Different Types of Browning Reactions: Enzymatic and Non Enzymatic.
9. To Study Gelatinization Behavior Of Various Starches
10. Determination Of Alkalinity/ Hardness Of Water
11. Estimation Of Reducing Sugar By Fehlings Procedure
12. Study Quality Characteristics of Foods Preserved By Drying/Dehydration/ Freezing.
13. Estimation of Gluten Content of Flour.
14. Estimation of Pelenske Value of Flour.
15. Estimation of Potassium Bromate in Flour.
16. Determination of Drying Characteristics
17. Determination of Viscosity Of Newtonian And Non Newtonian Fluids
18. Study of Effect Of Temperature On Viscosity
19. Psychrometrics- Use And Application

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Semester-II

Elective I Dairy Technology (4+0+0)

UNIT-I

Milk types, Composition, Physical Chemical properties. Production, collection, testing quality, cooling, storage, and transportation of liquid milks. Receiving and quality assessing of liquid milk in dairy industry for detection of adulteration, decision for acceptance/rejection of the milk, Defects in market milk

UNIT-II

Standardization and/or processing (pasteurization, sterilization and Ultra High Temperature processing), storage, packaging and distribution of liquid milks: whole, standardized, toned, double-toned, and skimmed milk. Recombined, reconstituted, and flavoured milks.

UNIT-III

Milk Products: Definition, composition, methods of preparation/production, quality and/or grading parameters, packaging, storage characteristics, uses and shelf-life of cream, Technology and chemistry of Ice-Creams, butter and ghee; evaporated and condensed milks, skimmed, whole and instants milk powders. Evaporated and condensed milk.

UNIT-IV

Cheese: Definition, composition, classification, methods of manufacture, cheddar, Gouda, cottage and processed cheese, evaluation, defects in cheese. Manufacturing methods of. Indigenous milk products such as yoghurt, dahi, khoa, burfi, gulabjamun, rosogolla, chhana, paneer, ghee, lassi etc; probiotic milk products.

UNIT-V

Good hygienic practice in milk processing: Principal hazards, cleaning and disinfection in a dairy industry, cleaning systems (cleaning in place, central cleaning system, self-contained cleaning system). Milk and milk products standards and legislations in India, Grading of milk and criterion of grading. Newer concepts in dairy products- cream powder, sterilized cream, butter spread, butter powder, cheese spread, caseinates, co-precipitates, WPC, lactose powder.

SUGGESTED READINGS:

1. Dey. S.1980. Outlines of Dairy Technology. Oxford Univ. Press. New Delhi
2. Spreer E. 1993. Milk and Dairy Products. Marcel Dekker.
3. Walstra P. 1999. Dairy Technology. Marcel Dekker.
4. Aneja RP, Mathur BN, Chandan RC & Banerjee AK. 2002. Technology of Indian Milk Products. Dairy India Publ.
5. Rathore NS et al. 2008. Fundamentals of Dairy Technology - Theory & Practices. Himanshu Publ
6. Walstra P. (Ed.). 2006. Dairy Science and Technology. 2nd Ed. Taylor & Francis.

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Semester-II

Elective I: Meat, Fish and Poultry Technology (4+0+0)

UNIT-I

Scope of meat industry: Status and Introduction to meat, fish and poultry industry, Meat production, processing and consumption.

UNIT-II

Structure, composition and nutritive value of meat tissues, Postmortem changes, Pre-slaughter handling, Death of the Animal—stunning and bleeding, dressing and cutting, Post slaughter care and post mortem inspection – classification and quality of meat. Aging, Curing, Smoking, Canning, Irradiation, Freezing and Dehydration of Meat and Meat Products.

Formed and Sectioned Meat Production Method, Meat Sausages- Classification, Ingredients and Production Technology. Recent trends in meat processing.

UNIT-III

Chemical composition and nutritive value of poultry meat, Pre-slaughter handling, Transport and Dressing of poultry, Antemortem and postmortem examination of poultry.

Egg: Structure, composition, and nutritional aspects of eggs. Grading, Storage and transportation of whole eggs. Microbial spoilage of eggs, Preservation and maintenance of eggs, Processing of eggs and egg products (liquid and solid products)

UNIT-IV

Fish: Types of fish, Composition and Nutritive Value, Post-mortem changes in fish. Unit operations in fish processing. Canning, Smoking, Salting, Curing, Freezing and Drying/Dehydration of fishes. Fish spoilage, Fish sausages. Manufacturing of fish paste, fish sauces, fish oil, fish protein concentrate. Utilization of meat, fish and egg industry by-products: importance, food and non-food applications.

SUGGESTED READINGS:

1. Meat and Meat Products Technology (Including Poultry Products Technology) by B.D Sharma.
2. Meat Science by R.A. Lawrie, Pergamon Press.
3. Poultry Products Technology by G.J. Mountney.
4. Meat, Poultry and Sea Food Technology by R.L. Henricksons.
5. Poultry Meat and Egg Production by Parkhurst and Mountne

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Semester-II

Elective I: Fermentation Technology (4+0+0)

Unit-I

Introduction to fermentation: Rate of microbial growth and death. Fermentation kinetics, Types of fermentation sub-merged/solid state, Batch /continuous fermentation.

Unit-II

Fermenter design, operation, measurement and control in fermentation, Aeration and agitation in fermentation: Oxygen requirement, measurement of adsorption coefficients, sterilization of air and media; scale up in fermentation.

Unit-III

Production of beer, wine and vinegar, Traditional fermented foods like idli and dosa. Principles of downstream processing and Product recovery. Fermentative Production of Beer, Wines, Cider and Vinegar. Fermented Vegetables (Pickles). Production of Baker's Yeast, Microbial Proteins and fats,

Unit-IV

Food enzymes and Food additives. Oriental fermented foods. Production of alcohols, organic acids, enzymes and immobilization of enzymes. Use of genetically modified microorganisms in food processing. Biological waste treatment.

SUGGESTED READINGS:

1. Industrial Microbiology - Prescott & Dunn
2. Industrial Microbiology - L.E. Casida
3. Principle of Fermentation Technology - Whittaker and Stanbury
4. Handbook of Indigenous Fermented Foods - K.H. Steinkrus

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Semester-II

Elective II Fruits and Vegetable Technology (4+0+0)

UNIT-I

Structural, Compositional and Nutritional aspects of fruits and vegetables. Post harvest changes, storage, handling and preservation of fresh fruits and vegetables, controlled and modified atmosphere storage. Present scenario of fruits and vegetable industry in india.

UNIT-II

Techniques of processing and preservation of fruits and vegetables by refrigeration and freezing, canning and bottling, drying and dehydration. Canning: Machinery and equipments, canning of different fruits and vegetables.

UNIT-III

Technology of fruits and vegetable products: Juices and pulps, Concentrates and powders, Squashes, cordials nectars, fruit drinks and carbonated beverages and its quality control.

UNIT-IV

Other fruits and vegetables products: Jam, Jellies and Marmalades. Preserves, candies and crystallized fruits. Tomato products: Puree, Paste, Ketchup, Sauce and soup. Chutneys, pickles and other products.

UNIT-V

Stages of new product development, by-products from fruit and vegetable wastes, utilization and disposal of fruit industry wastes. Technology of mushroom: production, processing and its processed products. Technology of cashew and coconut: chemical composition, processing and processed products. Specialty fruit and vegetable products.

SUGGESTED READINGS:

1. Food science by B.Srilakshami;New Age International.
2. Fundamentals of Foods and Nutrition by R. Madambi and M.V. Rajgopal.
3. Foods: Facts and Principles by N Shakuntala manay;New Age International (P) Ltd.
4. Preservation of Fruits and Vegetable by Girdhari lal and Sidappa; CBS Publications.
5. An introduction to the Post-harvest physiology and handling of fruits.

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Semester-II

Elective II: Technology of Cereals, Pulses and Oilseeds (4+0+0)

UNIT-I

Composition, Structure and Processing characteristic of Cereal grains, Legumes and oilseeds, Post-harvest, Processing practices for their safe storage. Parboiling and Milling of paddy, Quality characteristics, curing and aging of rice, processed rice products.

UNIT-II

Status and future scenario of world wheat production and uses. Criteria of wheat quality—physical and chemical. Wheat and its quality characteristics for milling into flour and semolina, Flour milling, Turbo grinding and air classification, Flour grades and their suitability for baking purposes, Assessment of flour quality and characteristics, Milling of Durum wheat, Macaroni products. Functionality of wheat proteins, carbohydrates and lipids in bakery products. Enzymes of wheat and their technological significance.

UNIT-III

Dough rheology and dough testing apparatus such as recording dough mixers. Bread making processes, importance of critical unit operations, development in bread making methods, functions of ingredients/additives such as fat, emulsifiers, oxidants, reducing agents, conditioners. Bread faults and remedies. Technology of biscuit, cake, cookie and cracker manufacture. Functions of ingredients in soft wheat products. Durum wheat- chemistry, quality and technology of pasta products.

UNIT-IV

Processing of Oilseeds: Composition, processing of oilseeds as protein concentrations, properties and uses of oil seed meals, technology vegetable protein isolates; Barrier compounds in the utilization of oil seed proteins. Low cost protein foods from oilseeds.

UNIT-V

Chemical, technological and nutritional aspects of sorghum, oats and millets. Dry and Wet milling of corn, Starches and its conversion products, Malting of barley, Pearling of Millets, Milling of legume-pulses by traditional and improved processes.

SUGGESTED READINGS:

1. Samuel, A.M. (2014). The Chemistry and Technology of Cereals as Food and Feed: CBS.
2. Khan, K. & Shewry, P. R. (2009). Wheat: Chemistry and Technology: St. Paul, U.S.A.
3. Champagne, E.T. (2004). Rice: Chemistry and Technology (3rd ed.): AACC, USA.
4. Dendy, D. A. V. & Dobraszczyk, B. J. (2001). Cereals and Cereal Products: Chemistry and Technology: Aspen, Maryland.
5. Pomeranz, Y. (1998). Wheat: Chemistry and Technology (3rd ed.): AACC, USA.

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Semester-II

Elective II: Bakery Technology

Unit-I

Status of bakery food in India and abroad, Materials for baking: Wheat flour and wheat flour treatments: Grade of flour, constituents of flour – ageing of flour – Tests for flour quality. Yeast: types of yeast, yeast characteristics, Preparation, Handling & Storage, Adequacy for use in bakery industry. Shortenings: types and role of shortenings, Emulsifiers and antioxidants: types and their roles, Sweeteners used in bakery, Technology and quality parameters for baked products: Bread, Biscuits and cakes.

Unit-II

Bakery equipment and machinery: Different types of Mixers, kneaders and cutters. Different types of ovens. Packaging machinery for bread and biscuits. Quality control in bakery industry. Quality control of raw materials. Quality control of finished products. Quality control of packaging materials.

Unit-III

Technology of bread making Different methods: Process steps and their significance. Characteristics of good bread. Defects in bread their causes and remedies.

Unit-IV

Technology of Cakes Manufacture: Different cake making processes. Sugar batter method, Flour batter method, Modified sugar batter method Whipping method, Blending method etc. Process steps and their significance. Importance of baking time and temperature. Recipe balancing .Defects in cakes, their causes and remedies.

UNIT-V

Biscuits: Definition and types. Fermented dough biscuits. Cookies. Types of cookies and their manufacture. Cream biscuits. Process steps and their significance. Defects in biscuits their causes and remedies.

Reference Books

1. E.J Pyler: Baking Science and Technology: Vol.1 & 2, 3rd Edition, Sosland, 1988
2. Samuel A.Matz: Bakery Technology and Engineering, Springer US
3. Samuel A.Matz: Cookie and Cracker technology, AVI Publications
4. H. Faridi:The Science of Cookie and Cracker Production, CBS Publishers & Distributors, N Delhi

