(Applicable to the batch of students admitted in the academic year 2025-26 onwards)

B.Sc. Food Science & Quality Control (CBCS) FACULTY OF SCIENCE, SU

B.Sc. (FOOD SCIENCE & QUALITY CONTROL)
Syllabus (CBCS)
(w.e.f. 2025-2026)

FACULTY OF SCIENCE
SATAVAHANA UNIVERSITY
KARIMNAGAR – 505002

2025

TELANGANA STATE COUNCIL OF HIGHER EDUCATION

PROPOSED CBCS COMMON CORE SCHEME FOR B.Sc. COURSE

FOOD SCIENCE AND QUALITY CONTROL

CODE	PAPER TITLE	Course Type	HPW	Credits
	FIRST YEAR - Semester - I			
FSQP 104	DSC-1A: Food Chemistry & Nutrition	DSC-1A	4T + 2P = 6	4+1=5
	FIRST YEAR - Semester - II			
FSQP 204	DSC-1B: Food Microbiology, sanitation and hygiene	DSC-1B	4T + 2P = 6	4+1=5
	SECOND YEAR - Semester - III			
FSQP 304	DSC-1C: Post harvest technology of field crops	DSC-1C	4T + 2P = 6	4+1=5
	SECOND YEAR - Semester - IV			
FSQP 404	DSC-1D: Technology of Animal Foods	DSC-1D	4T + 2P = 6	4+1=5
	THIRD YEAR - Semester - V			
FSQP 501	SEC – 1: Food Toxicology	SEC - 1	2	2
FSQP 502	SEC – 2: Food Analysis	SEC - 2	2	2
FSQP 503	VAC -1	VAC - 1	3	3
FSQP 504	Multi-Disciplinary Course (MDC)	MDC	4T	4
FSQP 505	DSE -1A: Fermented foods and beverages technology DSE - 1B: Bakery and Confectionary technology DSE - 1C	DSE - 1A/ DSE - 1B/ DSE - 1C	4T + 2P = 6	4+1=5
	THIRD YEAR - Semester – VI			
FSQP 601	SEC – 3: Introduction to Food Engineering	SEC - 3	2	2
FSQP 602	SEC – 4: Entrepreneurship Development & Management in Food Industry	SEC - 4	2	2
FSQP 603	VAC - 2	VAC -2	3	3
SQP 604	DSE - 2A: Food safety, Quality control and sensory evaluation DSE - 2B: Food Packaging DSE – 2C	DSE - 2A / DSE - 2B/ DSE – 2C	4T + 2P = 6	4+1=5
	Project	PROJECT	4	4

SEC – Skill Enhancement Course, VAC – Value Added Course, (MDC) - Multi-Disciplinary Course, DSC – Discipline Specific Course, DSE – Discipline Specific Elective

B.Sc. Food Science and Quality Control
Semester I
FOOD CHEMISTRY & NUTRITION

UNIT – I

1. Introduction to nutrition – definition of nutrition, Food as a source of nutrients. Functions of foods
2. Inter relationship between nutrition and health, visible symptoms of good health.
3. Food guide-basic five food groups and usage of food guide.
4. Use of food in body-digestion, absorption, transport, utilization of nutrients in the body.

UNIT – II

1. Carbohydrates- composition, classification, sources, functions, structure, physical & chemical properties.
2. Lipids – classification, composition, nomenclature, saturated& unsaturated fatty acids, food sources, functions of fats.
3. Proteins – composition, classification, sources, functions, denaturation, and protein deficiency, determination of protein quality.
4. Amino acids – classification, Physio-chemical properties, modification of food protein through processing and storage.

UNIT – III

1. Water as a nutrient, function, sources, requirement, structure and water balance – effect of deficiency.
2. Moisture in food: Hydrogen bonding, Bound water, free water, Water activity and Food stability.
3. Energy – Unit of energy, food as a source of energy, energy value of food, the body's need for energy, energy requirement for different age groups. B.M.R. activities
4. Enzymes. Nomenclature, specificity, uses of enzymes in foods, enzyme added to food during processing

UNIT – IV

1. Mineral functions, sources, Bio-availability, and deficiency of following minerals – calcium, Iron, Iodine, Fluorine, sodium, potassium.
2. Vitamins – Classification, units of measurement, sources, functions and deficiency diseases caused by following vitamins:
3. Pigments indigenous to food, structure, chemical and physical properties. Effect of processing and storage.
4. Flavours – Vegetables, fruit and spice flavours, fermented food, Meat and sea food.

PRACTICALS

1. Experiments on properties of monosaccharides- Glucose, Fructose and Galactose
2. Experiments on properties of Disaccharides - maltose, lactose and sucrose.
3. Experiments on properties of Polysaccharides -starch
4. Estimation of glucose in a given sample.
5. Experiments on properties of amino-acids.
6. Experiments on properties of proteins
7. Experiments on properties of fats.
8. Saponification number of lipids.
9. Determination of T S S
10. Determination of Ash content

B.Sc. Food Science and Quality Control
Semester II
FOOD MICROBIOLOGY, SANITATION AND HYGIENE

UNIT – I

1. Introduction to microbiology and its relevance to everyday life-General morphology of micro-organisms – General characteristics of bacteria, fungi, virus, protozoa, algae.
2. Control of micro-organisms, growth curve – Effect of environmental factors on growth of microorganisms-pH, water activity – oxygen availability, temperature & others.
3. The relationship of micro-organism to sanitation. Role of microbiology-Environment effects of microbial growth.

UNIT – II

1. Effects of micro-organisms on food degradation and food bore illness – Bacteria, Virus, Molds, Yeasts and parasites (food poisoning).
2. Other food hazards – chemicals, antibiotics, hormones, metals contamination – poisonous foods.
3. Other agents of contamination: Human, domestic animals, vermins, birds.
4. Beneficial effect of micro-organisms.

UNIT – III

Microbiology of different foods – Spoilage and contamination- Sources, types, effects on the following:

a) Cereals & Cereals products.
b) Vegetables & Fruits.
c) Meat & Meat products.
d) Eggs & Poultry.
e) Milk & Milk products.

UNIT – IV

1. Importance of personal hygiene of food handlers – clothes, illness. Education of food handler in handling and serving food
2. Safety in food procurement,' storage, handling and preparation – control of spoilage – safety of left over foods.
3. Cleaning and sanitization. Products and methods – use of detergents and chemicals Planning and implementation of training programmes for health personnel.
4. Relevance of microbiological standards for food safety.

REFERENCES:

1. Adams, M.R and Mass, M.D. (2008). Food Microbiology. New Age International Pvt. Ltd. Publishers.
2. Banwart, G.T. (1987). Basic Food Microbiology. CBS Publications: New Delhi.
3. Block, J.G. (1999). Microbiology Principles and Explorations. 4th Edition. John Wiley and sons Inc.
4. Frazier, W.C. (1968). Food Microbiology. 4th Edition. McGraw Hill Inc.
5. Jay, J.M., Lossner, M.J and Golden, D.A. (2008). Modern Food Microbiology. 7th edition. Springer. ISBN: 0387231803
6. Kawata, J.G. (1963). Environment Sanitation in India. Lucknow Publishing House.
7. Longree, K. (1967). Quality Food Sanitation. McGraw Hill Publishers: New York.
8. Pelczar Jr. M.J. Chan. E.C.S and Kreig.N.R (2006)."Microbiology"- 5th Edition McGraw Hill. Inc. New York.

PRACTICALS
FOOD MICROBIOLOGY, SANITATION AND HYGIENE

1. Microscope and its parts. Examination under low power/high power and oil immersion objectives.
2. Gram staining, Isolation and Identification.
3. Ziehl-Neelsen staining.
4. Examination of yeasts, mould and non-pathogenic bacteria.
5. Study of sterilization equipments.
6. On the job training for 1 month during summer break.

B.SC. FOOD SCIENCE AND QUALITY CONTROL
SEMESTER III
POST HARVEST TECHNOLOGY OF FIELD CROPS

UNIT I
Vegetables
Composition, Classification, Nutritive Value, Changes during cooking, storage, factors affecting storage and post-harvest losses. Canning and blanching of fruits and vegetables Preparation and preservation of seasonal pickles, tomato ketchup and chutneys.
Fruits
Composition, Classification, Nutritive Value, Post harvest Changes and Storage, ripening of fruits, enzymatic browning. Processing and preservation of fruit products-jam, jelly, marmalade, nectar, cordial, squashes.

UNIT II
CEREALS AND MILLETS
Rice-Types, structure, chemical composition, Nutritive Value, milling-parboiling, ageing, processed food products of rice.
Wheat-Types, structure, composition, Nutritive value, milling of wheat, milling types, milling of wheat in to different types of flours, processed wheat products.
Millets- Ragi, Jowar, Bajra- structure, chemical composition, processed millet products and health benefits.

UNIT III
PULSES & LEGUMES
Composition, Nutritive Value, Processing of Pulses and Legumes-milling of pulses by traditional and commercial methods-dry milling of pulses, milling of pulses by CFTRI method.
Toxic constituents of pulses -Trypsin Inhibitors, Lathyrogens, Favism, Haemagglutinins, Cyanogenic Glycoside, Saponins and Goitrogens. Methods to eliminate toxic constituents.

UNIT IV
NUTS & OILSEEDS
Nuts & Oilseeds – Composition and Nutritive Value, Processing of groundnut & sunflower seeds in to edible oils, Hydrogenation of oils, Rancidity of Oils- Definition, Types and prevention. Anti-oxidants used to extend shelf life of oils, adulteration of different oils and methods used to determine adulteration

PRATICALS

POST HARVEST TECHNOLOGY OF FIELD WORKS

1. Preservation of fruits and vegetables by following methods:
   a. Canning
   b. Squash/Jam/Nectar
   c. Pickles
   d. Drying
2. To process and preserve fruit and vegetable-based products
3. To observe processing of cereals, , oils at various food manufacturing Units
4. Simple physical and chemical tests to be determine quality and detect adulterants in the following:
   i. Oil and Fats
   ii. Spices and Condiments (any five)
   iii. Food Grains, Pulses and Oilseeds,
   iv. Flours – Wheat
   v. Canned foods
   vi. Sugar and Honey
   vii. Milk & Milk

REFERENCES

1. Bennion, M and Scheule, B. (2014). Introductory Foods. Pearson education.
2. Manay, N.S and Shadaksharaswamy, M. (2001). Food Facts and Principles. New Age International Publishers.
3. Srilakshmi, B. (2007). Food Science. New Age International.
4. Subbulakshmi, G. (2001). Food Science and Preservation. New Age International (P) Ltd.

B.SC. FOOD SCIENCE AND QUALITY CONTROL
SEMESTER IV
TECHNOLOGY OF ANIMAL FOODS

Unit-I

Definition of milk- composition, sources of milk, types of cow and buffalo varieties for high yielding of milk and nutritive value of milk-physical and chemical properties of milk. Processing of milk: Receiving of milk, Platform tests, filtration and clarification, standardization – Pasteurisation methods - Sterilisation methods, Homogenisation, packaging and distribution of milk. Types of milk. Milk production as an entrepreneurship activity- government schemes.

Unit-II

Processing of milk in to different milk products-Cream, butter, ghee, cheese-types.
Fermented milk products.
Manufacturing of Ice-cream- Definition, classification, composition, ingredients used, colours and flavours used, defects and over-run-in ice-cream.
Manufacturing of indigenous milk products-Khoa, kalakhand, paneer, rasogolla, channa.

Unit III

Meat industry in India-sources of meat-composition, nutritive value and microscopic structure of meat- stunning and slaughtering methods -Post mortem changes in meat-meat preservation methods and packaging of meat
Classification of poultry meat; Composition and nutritional value of poultry meat; Processing of poultry meat; By-product utilization. Structure, composition and nutritive value of egg.

Unit-IV

Fish industry and production in India. Classification of fresh water fish and marine fish; Commercial handling, storage and transport of raw fish; Average composition of fish; Freshness criteria and quality assessment of fish; Spoilage of Fish; Methods of Preservation of fish: Canning, Freezing, Drying, Salting, Smoking and Curing. Fish products and shrimp processing

Suggested Readings:

- Aneja RP, Mathur BN, Chandan RC & Banerjee AK. 2002. Technology of Indian Milk Products. Dairy India Publ.
- De Sukumar,1980. *Outlines of Dairy Technology*. Oxford Univ. Press.
- Rathore NS *et al.* 2008. *Fundamentals of Dairy Technology - Theory &Practices*. Himanshu Publ
- Web BH, Johnson AH & Lford JA. 1987. *Fundamental of Dairy Chemistry*. 3rd Ed. AVI Publ.
- Spreer E. 1993. Milk and Dairy Products. Marcel Dekker.
- Walstra P. 1999. Dairy Technology. Marcel Dekker.

PRACTICALS

1) Study on basics of reception of milk at the plant;
2) platform tests in milk;
3) estimation and fat and SNF in milk;
4) Operation of LTLT & HTST
5) Pasteurization; Preparation of special milks;
6) Cream separation & standardization of milk;
7) Preparation and evaluation of table butter, ice cream, cheese and indigenous milk product such as khoa, chhana, paneer, ghee, rasogulla, gulab jamun, shrikhand, lassi, burfi etc.; Visit to dairy plants.

B. Sc. FOOD SCIENCE & QUALITY CONTROL

SEMESTER-V

SEC – 1: FOOD TOXICOLOGY

UNIT I- INTRODUCTION TO TOXICOLOGY

Definition- Toxicology- importance- scope – basic divisions- Goals- Basic concept of Toxicology

Toxicants in Plant foods- Seafood toxins- Antivitamins- Radioactive metals in foods- Toxic minerals- other inorganic compounds occur in Food & Water

UNIT – II TOXICANTS OF PUBLIC HEALTH HAZARD

Chemical contaminants- pesticide residues- types of pesticides- automobile emissions (CO, SO2, NO), Hydrocarbons- photochemical products- heavy metals (Mercury, Arsenic, Lead, Cadmium, Aluminium, Tin), Food additives- types- health hazards- radioactive substances-kinds of radiators- sources of radiations- biological effect of radiations Absorption, Assimilation, utilization and excretion of xenobiotics- Biotransformation- Phase I and Phase II-Types- Mechanism of chemical carcinogens-mutagens and Teratogens

Antioxidants- colors-stabilizers –GM Foods and their safety

REFERENCES:

B. Jacob, Chemical analysis of food and food products by Morris, 3rd edtn,

Nutritional and Toxicological aspects of food processing edt. Walker and E. Quattrucci Tayloss and Francis New York 1980

B. Sc. FOOD SCIENCE & QUALITY CONTROL

SEMESTER-V

SEC – 2: FOOD ANALYSIS

UNIT I - INTRODUCTION TO FOOD ANALYSIS

Introduction to food analysis
Sampling, Population, Proximate Principles
Importance of sampling
Sampling technique
Types of sampling
Sampling Plan
Preparation of samples
Problems in sampling
Food Rheology
Viscosity
Surface Tension
Refractometry
Polarimetry
Freezing point
Specific gravity

UNIT II- ANALYSIS OF FOODS

MOISTURE ANALYSIS- Oven drying method, Distillation method, Karl-Fischer, Titration Method, San Pan Technique

ASH ANALYSIS- Dry, Wet, Low temperature, Plasma Ashing, Soluble and Insoluble Ash in Water, Ash insoluble in acid

TOTAL CARBOHYDRATE ANALYSIS- Lane and Eynon's Metho, Nelson-Somogyi method, Alkaline ferric cyanide method, Phenol-sulphuric acid method, Starch Analysis.

FIBRE ANALYSIS: - Crude Fibre analysis, Dietary Fibre Analysis by AOAC method

B. Sc. FOOD SCIENCE & QUALITY CONTROL

SEMESTER-V

DSE – 1 (A): TECHNOLOGY OF FERMENTED FOODS AND BEVERAGES

UNIT-I

Fermented foods:

- Introduction to fermentation-types of fermentation, benefits of fermentation.
- Production of sauerkraut: Preparation of traditional pickles-fermentation of pickles and microbiology involved in preservation of pickles.
- Traditional fermented foods like Idli, Dosa - Manufacturing process and microorganisms involved in fermentation, importance of nutritive value as a breakfast food.

UNIT-II

Beverages:

- Introduction and classification of beverages; Growth of beverage industry in India; Ingredients used in beverages
- Water- Introduction, Sources, types of water, different methods of purification of water, BIS standards for packaged drinking water.
- Additives used in beverages- colours, flavours, sweetners and preservatives.

UNIT-III

- Fruit based beverages – manufacturing process and preservation of Nectar, Cordial, Squash.
- Carbonated beverages - soft drinks-manufacturing process, role of ingredients used in soft drinks, leading companies in the world and their products
- Low calorie beverages, sports drinks.
- Tea and coffee processing- manufacturing process and different types of tea and coffee beverages.

UNIT-IV

Alcoholic beverages:

- Introduction to alcoholic beverages, types, role of ingredients used in alcoholic beverages.
- Wine- - Ingredients used types of wine, manufacturing process of wine, fermentation and preservation of wine, uses and demerits of wine on consumption as an alcoholic beverage.
- Beer-Ingredients used types of beer, manufacturing process and role of yeast in fermentation of beer, packaging of beer.
- Distilled beverages: Rum, brandy and whisky.

SUGGESTED READINGS:

- Ravinder, A. Srinivas Maloo and Dr. Emmanuel, S.J. 2013. Hand Book of Fermented foods and Beverages, 1st edition. Mumbai: Himalaya Books Publishing House.
- Priest, F.G. and Stewart, G.G. 2006. Handbook of Brewing. 2nd edition. New Delhi: CRC Publication.
- Richard, P. 1981. Commercial Wine Making - Processing and Controls. New Delhi: AVI Publication.
- Prescott, S.C. and Dunn, C.G. 1959. Industrial Microbiology. 6th edition. New Delhi: Tata McGraw Hill.
- Varnam, A.H.and Sutherland, J.P. 1994. Beverages: Technology, Chemistry and Microbiology. Scotland: Chapman & Hall.
- Woodroof, J.G.and Phillips, G.F.1974. Beverages: Carbonated and non-carbonated. New Delhi: AVI Publication.

PRACTICALS
TECHNOLOGY OF FERMENTED FOODS AND BEVERAGES

1. Preparation of yoghurt
2. Preparation of buttermilk
3. Preparation of whey based fermented beverages
4. Preparation of pickles
5. Preparation of wine
6. Production of sauerkraut
7. Preparation of fruit beverages
8. Preparation of carbonated soft drinks
9. Preparation of non-carbonated and non-alcoholic beverages
10. Visit to beverage industry

B. Sc. FOOD SCIENCE & QUALITY CONTROL

SEMESTER-V

DSE – 1 (B): BAKERY AND CONFECTIONARY TECHNOLOGY

Unit - I

1. Introduction: Status and scope of bakery industry in India,
2. Raw material for bakery products, their role and PFA specification of this raw material. Bread making processes,
3. Different types of bread and preparation of bread using different methods, quality evaluation of bread, staling of bread.

Unit - II

1. Technology of biscuit, cookies, crackers and cakes manufacturing: Different types of biscuits and preparation of biscuits using different methods, quality evaluation of biscuits.
2. Preparation of cakes using different methods, types of cakes quality evaluation of cakes.
3. Technology of noodles and pasta products, hygienic condition required in bakery plant, operation and maintenance of bakery equipment

Unit - III

1. Status of confectionery industries in India – Types of sugar: granulated, Caster, Icing, Liquid sugars, Brown Sugars, Molasses, and microcrystalline sugars.
2. Composition of sugars- Properties of sugar and sugar solutions – Glucose syrups and refined glucose syrups in sugar confectionery manufacture.
3. Oils and Fats – uses in confectionery items, Milk and related products, Composition of milk and functional properties of its major components, Application of milk and milk-based ingredients.

UNIT –IV

1. Colors – Factors influencing choice – natural and Synthetics colors. Flavoring - Natural and Artificial – Flavor Strength, factors effecting stability of flavoring compounds.
2. General technical aspects of industrial sugar confectionery manufacture, Compositional effects, change of state, evaporation, sweetness and taste.
3. Manufacture of hard-boiled sweets: ingredients, Prevention of recrystallization and stickiness

Practicals

1. Physico chemical properties of wheat and wheat-based products.
2. Quality assessment: Flour, yeast, water, leavening agents.
3. Manufacturing and comparative Sensory evaluation of bread.
4. Manufacturing and comparative sensory evaluation of cakes.
5. Analysis of confectionery products
6. Handling of processing equipment in sugar confectionery
7. Preparation of Hard-boiled sweets
8. Preparation of Chocolate syrup and moulded chocolates
9. Preparation of Fudge
10. Preparation of fondant
11. Preparation of marshmallow
12. Visit to the Sugar Confectionary Industry

B. Sc. FOOD SCIENCE AND QUALITY CONTROL
SEMESTER VI
SEC - 3: INTRODUCTION TO FOOD ENGINEERING

UNIT I- INTRODUCTION

Dimensions – Primary and Secondary Engineering Units – Base units, Derived units and supplementary units
System – State of a system, extensive and intensive properties
Density – Solid, Particle and Bulk density, Concentration, Temperature, Pressure, Enthalpy, Power and area, Phase diagram of water

UNIT II – THERMODYNAMICS AND EQUILIBRIUM

Conservation of mass- conservation of mass for an open system and a closed system
Thermodynamics – laws of thermodynamics, Equation of state and Perfect Gas Law
Energy – potential and kinetic energy, Energy balance for a closed system and an open system, total energy balance, Properties of liquids - Density, Pressure, Surface tension and Viscosity.
Newtonian and non-Newtonian fluids, laminar and turbulent fluid, The Continuity equation, Reynold's number
Energy equation for steady flow of fluids – pressure, kinetic energy, potential energy, frictional loss, power requirements of a pump

REFERENCES

Dincer, I. Heat Transfer Food Cooling Applications. Taylor and Francis Publishers, USA. 1997.

Heldman, D.R. and Lund, D.B. Handbook of Food Engineering 2nd edition. CRC press, New York, 2007.

Singh, R.P. Introduction to Food Engineering 3rd edition. Academic Press, London. 2004.

B. Sc. FOOD SCIENCE AND QUALITY CONTROL
SEMESTER VI
SEC – 4: ENTREPRENEURSHIP DEVELOPMENT & MANAGEMENT IN FOOD INDUSTRY

UNIT I

Entrepreneurship: Definition, characteristics and traits, difference between entrepreneur, intrapreneur and manager, types of entrepreneurs, role of entrepreneurs in economic development

Project formulation- various approaches principles of product selection and development techno-economic feasibility of the project, structure of project report

UNIT II

Role of Government in promoting Entrepreneurship

Incentives, subsidies and grants

Agencies and their role - DIC, SISI, EDII, NIESBUD, NEDB

Management- Characteristics, Objectives, Principles, Challenges, Importance, Levels of management, Food industry and Management

Product Development - need for new products, stages in product development, factors to be considered for it, Pricing and distribution of new product -kinds of pricing, sales promotion techniques

REFERENCES

Gupta, C.P. Entrepreneurship Development in India. Sultan Chand & sons, New Delhi

Abraham, M.M. Entrepreneurship Development & Management, Prakash Publications, Changanacherry, 2000.

B. Sc. FOOD SCIENCE AND QUALITY CONTROL
SEMESTER VI
DSE – 2 (A): FOOD SAFETY, QUALITY CONTROL AND SENSORY EVALUATION

UNIT-1
Food safety: Characterization and risk analysis- Food hazards: Physical, Chemical and biological systems for food safety. Hazard Analysis Critical Control Point (HACCP) and its implementation.

UNIT-II
Quality Assurance: Theoretical and practical considerations, description of different systems: GAP, GMP, TQM, ISO. Indian food standards- Voluntary and Obligatory standards (PFA, FPO, MMPO, AGMARK etc.) Codex Alimentarius, Worldwide food safety issues.

UNIT-III
Sensory evaluation: Requirements and methods. Sensory parameters: Colour, flavour, texture, taste, aroma, general acceptability. Subjective and Objective test of sensory parameters. (Differential test, Descriptive test, Rating test, Sensitivity threshold test).

UNIT –IV
Clean In Place (CIP)- Different sanitizers and detergents- Sanitation and hygiene in quality assurance in different food industries (Fruits and vegetables, Meat, Milk, Cereal Based). Cost of Quality, Supplier development.

References:

- Amerine MA, Pangborn RM & Rosslos EB. 1965. Principles of Sensory Evaluation of Food. Academic Press.
- Early R.1995.Guide to Quality Management Systems for Food Industries. Blackie Academic.
- Furia TE.1980. Regulatory status of Direct Food Additives. CRC Press.
- Jellinek G. 1985. Sensory Evaluation of Food - Theory and Practice. Ellis Horwoood.
- Krammer A & Twigg BA.1973. Quality Control in Food Industry. Vol. I, II. AVI Publ.
- Macrae R, Roloson R & Sadlu MJ. 1994. Encyclopedia of Food Science & Technology & Nutrition. Vol. XVI. Academic Press.
- Piggott J.R. 1984. Sensory Evaluation of Food. Elsevier Applied Science.
- Ranganna S. 2001. Handbook of Analysis and Quality Control for Fruit and Vegetable Products. 2nd Ed. Tata-McGraw-Hill.
- Export/Import policy by Govt. of India.

Practicals

1. To study the essential elements of Good lab practices.
2. Estimation of adulterants in various food products.
3. Detection of Indicator microbes in various food products.
4. To study the essential elements of Good Hygiene Practices.
5. To study the essential elements of Good Manufacturing Practices.
6. Application of Statistical quality control.
7. Study of QA department responsibility.
8. Study of QC department responsibility.
9. Tests for Sensory Evaluation Sensitivity
10. Threshold test, difference test – paired comparison, triangle and duo-trio test, scoring and ranking test.

B. Sc. FOOD SCIENCE AND QUALITY CONTROL

DSE – 2 (B): FOOD PACKAGING

SEMESTER VI

UNIT-1

Introduction to packaging. Packaging operation, package functions and design. Principle in the development of protective packaging. Deteriorative changes in food stuff and packaging methods for prevention, Shel life of packaged food stuff, methods to extend shelf life.

UNIT-II

Food containers: Wooden boxes, crates, plywood and wire bound boxes, corrugated and fiber board boxes, textile and paper sacks. Metal containers, tin plate, corrosion of containers. Food packages- Bags, pouches, wrappers, cartons and other traditional package.

UNIT-III

Flexible packaging materials (Paper, metal foils, polymers and laminates) and their properties. Packaging additives Consideration in the packaging of perishable and processed foods. Aluminum as packaging material. Bar coding, Printing, Package standards and regulation.

UNIT-IV

Trends in latest packaging- Modified atmospheric packing (MAP), Controlled atmospheric packaging (CAP), Oxygen Scavengers, Shrink packaging, Aseptic and retortable pouches etc. Flexible and laminated pouches, biodegradable packaging, Active packaging. Packaging of different food materials- Fruit and vegetables, meat, milk and egg products, oils, RTE foods etc.

Suggested Readings

- Crosby NT, Food Packaging: Aspects of Analysis and Migration Contaminants. 1981. App. Sci. Publ.
- Kadoya T. (Ed). 1990. Food Packaging. Academic Press.
- Mahadeviah M & Gowramma RV. 1996. Food Packaging Materials. Tata McGraw Hill.
- Palling SJ. (Ed). 1980. Developments in Food Packaging. App. Sci. Publ.
- Painy FA. 1992. A Handbook of Food Packaging. Blackie Academic.

Practicals

1. Food package material – scrap book
2. Shelf-life packed food products – weight gain or loss method, half value period method, direct weighting method
3. Physical test for tin and plastic
4. Testing of glass containers
5. Physical and chemical test for plastics
6. Visit to fruit/vegetable processing industry

B. Sc. FOOD SCIENCE AND QUALITY CONTROL
VI SEMESTER
PROJECT

To develop research and project writing skills in students.

A research or industrial project for **one month** will be allotted to each student after the V semester. They will be required to complete the data collection, analysis and writing of dissertation so as to submit it at the end of V Semester and to present it at seminar.