

ADIKAVI NANNAYA UNIVERSITY
CBCS/SEMESTER SYSTEM
V SEMESTER
B.SC FOOD TECHNOLOGY
W.E.FROM 2015-16AB

Sno	Course	Total Marks	Mid Sem Exam*	Sem End Exam	Teaching Hours**	Credits
1	INTRODUCTION TO COMPUTERS AND STATISTICS – 1	100	25	75	3	3
2	Lab Practical	50	0	50	2	2
3	FOOD PROCESSING EQUIPMENT - 1	100	25	75	3	3
4	Lab Practical	50	0	50	2	2
5	FOOD PACKAGING - 1	100	25	75	3	3
6	Lab Practical	50	0	50	2	2
7	FOOD QUALITY AND CERTIFICATION - 1	100	25	75	3	3
8	Lab Practical	50	0	50	2	2
9	FOOD ADDITIVES - 1	100	25	75	3	3
10	Lab Practical	50	0	50	3	3
11	FOOD TRADE AND BUSINESS MANAGEMENT - 1	100	25	75	6	4
	Total	850	-	-	32	30

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CBCS SEMESTER SYSTEM

SEMESTER V

INTRODUCTION TO COMPUTERS AND STATISTICS – 1

Theory:

Unit I:

Introduction to computers – Anatomy of computers – Input and output devices – Memory – Hardware – Software - Personal computers - Types of processors – Booting – Operating systems – DOS commands – Anatomy of Window - Title bar - Menu bar - Scroll bar - Tool bar.

Unit II:

MS Word – Creating, Formatting and Saving documents in MS Word -Understanding Word Processing - Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.

Unit III:

MS Excel – Using Spread Sheet - Basics of Spreadsheet - Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet, creating, editing, saving spread sheet - Use of inbuilt statistic functions, data analysis, Correlation, Regression, T test – Creating graphs.

Unit IV:

MS Power point – Creating slides, adding text, adding pictures, adding tables – Adding sounds - Animation affect – Presentation buttons - MS Access - Concept of data base - Unit of data base - Creating data base – Internet concepts.

Unit V:

Introduction to Internet - WWW and Web Browsers - Basic of Computer networks; LAN, WAN; Concept of Internet; Applications of Internet; connecting to internet; What is ISP; Knowing the Internet; Basics of internet connectivity related troubles hooting, World Wide Web; Web Browsing softwares, Search Engines; Understanding URL; Domain name; IP Address; Using e-governance website.

Practicals:

Semester – I

1. Introduction – Activating Windows 98 – Features – Start menu and shutting down windows – Desktop – Features – Working with windows.
2. Creation of files/folders copying files/folders – recycle bin – Features.
3. Windows explorer – Searching files and folders moving, copying and renaming of files and folders.
4. MS Word 2000-Creating a document, formatting a document and saving the document.
5. Editing the document, inserting tables – importing the formatting, saving and printing
6. Practice on MS Word 2000.
7. MS Excel 2000 – Creation of spreadsheet – Entering data – formatting and editing.
8. Alignment of workbook – Adding boarders – Patterns and columns.

9. Creating simple and mathematical formulas and computation.
10. Use of statistical functions – Use of function wizard – Computation of analysis of variance, correlation and regression.
11. Charting data – Use of different types of charts for representation of data, creation, modification and printing of charts.
12. Creating a database in MS Access – Use of preliminary functions.
13. Sorting – Saving and retrieval of database.
14. Practicing MS Access.
15. PowerPoint – Features, usage and advantages.
16. Creation of slides and transparencies – Inserting picture
17. Presentation of slides using slide show.
18. Internet access and browsing, Understanding URL, domain name and IP address

Books for Reference:

1. R. Rangaswamy, *A Text Book of Agriculture Statistics*.
2. Nageswara Rao, *Statistics for Agricultural Sciences*.
3. V.Rajaraman and N Adabala, *Fundamentals of Computers*.
4. MS DOS Published by Microsoft Corporation.
5. MS Office Published by Microsoft Corporation.
6. S.C.Gupta, *Fundamentals of Statistics*.
7. S.J. Amdekar, *Statistical Methods: For Agricultural and Biological Sciences*.

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SEMESTER V

FOOD PROCESSING EQUIPMENT - 1

Theory:

Unit I:

Material handling: Material handling machines and conveyors. Pretreatment unit operations: Cleaning, De-hulling and De-husking, Sorting & Grading, Peeling, Mixing and Forming, Size reduction and separation.

Unit II:

Physical properties of foods, Shape and size of grains and fruits, Bulk density and true density of grain, Porosity, Angle of repose, Test weight. Properties of Food materials and their significance in equipment design, processing and handling of food products.

Unit III:

Agitation and Mixing- Blending, pulverization equipment, Bread moulds, Pie and biscuit formers, confectionary mould. Hygienic design of Food Processing equipment, hygienic design principles and priorities. Sanitary requirement, sanitary pipes and fittings.

Unit IV:

Evaporation: Principles of evaporation, types and selection of evaporators, mass and energy balance. Design of single and multiple effect evaporators, material and energy balances, evaporator efficiency, recompression, heat and mass recovery and vacuum creating devises. Fouling of evaporators and heat exchangers.

Unit V:

Drying: Principles of drying, thin layer drying, moisture content, equilibrium moisture content, Hysteresis, drying curves, drying rate kinetics, Classification, mass and energy balance. Different types of dryers and components - roller, spray, tray, compartment, fluidized bed etc.

Practicals:

Semester - I

1. Determination of engineering properties of food materials.
2. Study of Plate type heat exchangers used in Dairy & Food Industry.
3. Studies on heat transfer through extended surfaces.
4. Studies on temperature distribution and heat transfer in HTST pasteurizer.
- 5-7. Design problems on heat exchangers.
8. Determination of viscosity of different food materials.
9. Study of evaporators and their material and enthalpy balances.
10. Demonstration of equilibrium sorption isotherms.

Books for Reference:

1. C.P. Arora, *Refrigeration and Air Conditioning*, Tata McGraw Hill Company, New Delhi, 2000.
2. P. Fellows, *Food Processing Technology, Principles and Practice*, CRC Press, 2000.
3. Nuri N. Mohsenin, *Physical Properties of Plant and Animal Materials*, Ed.2009
4. Earle R.L, *Unit Operations in Food Processing*. Pergamon Press, 1983.
5. K.M. Sahay and K.K Singh, *Unit Operations of Agricultural Processing*, Vikash Publication House, New Delhi.

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SEMESTER V

FOOD PACKAGING - 1

Theory:

Semester - I

Unit-I:

Packaging Science, Definition, History, Functions, Types of Materials - Uses, Application, Advantages and Disadvantages of each - Status of Packaging industry in India, Economics, Environmental hazards, Waste management and Consumer awareness.

Unit - II:

Need of Packaging food - Logistics - Merchandising Outlets - Handling - Transportation - Packaging machinery - Technology upgradation - Public distribution - Cost effective packaging - Packaging requirements - Levels of Packaging - Packaging functions - Attractiveness - Protection - Convenience - Printability – Differentiability.

Unit-III:

Labeling Laws - Packaging laws and Regulations - SWMA Rules - PFA Rules - FPO Rule MFPO Rules - Agmark Rules - Class 'A' commodities - Class 'B' commodities - Misbranded Labeling rules for infant foods.

Unit-IV:

Classification of Packages, Primary, Secondary and Tertiary – Special Box / Carton, Shrink, Aerosol, Vacuum, Boil-in-bag, Tetra pack, Squeeze tubes, etc. Significance and functions - Construction of Packages, Process Chart - Shelf life testing.

Unit-V:

Machinability - Environmental Impact - Low cost containment - Communication – Resealing features - Non toxicity - Aroma retention Hazards acting on Package during transportation - Moisture impact - Light impact – Common insect pests - Changes in food quality - Biological changes in food quality

Practicals:

Semester - I

1. Measurement of thickness of paper and paper boards.
2. Measurement of basic weight of paper and paper boards.
3. Measurement of bursting strength of paper and paper boards.
4. Measurement of resistance.
5. Visit to an Industry.
6. Visit to Dairy Industry.

Books for Reference:

1. Gorden I Robertson, *Food Packaging Principles and Practice*, CRC Press, London.
2. Ranganna S, *Handbook of Analysis and Quality Control, Fruits and Vegetables Products*, Tata Mc Graw Hill, New Delhi, 1986.

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SEMESTER V

FOOD QUALITY AND CERTIFICATION - 1

Theory:

Semester – I

Unit-I:

Food quality and its need in food industry - Definition of food quality - Role of food quality in Food Industry - Quality attributes - Classification of quality attributes.

Unit-II:

Food quality objectives, importance and functions of quality control - Methods of quality control - concepts of Rheology - Quality assessment of food materials i.e, fruits, vegetables, cereals and dairy products/milk and milk products

Unit-III:

Quality assessment of Food materials i.e, meat, poultry, egg and processed food products - Sensory evaluation – introduction, panel screening, selection methods. Interaction and thresholds, Statistical quality control.

Unit-IV:

Sensory and instrumental analysis in quality control. Consumer measurements: Factors influencing acceptance and preference, objectives of consumer preference studies, information obtained from consumer study.

Unit-V:

Factors influencing results from consumer surveys, Methods of approach, development of the questionnaire, types of questionnaires, serving procedures and other methods of data collection.

Practicals:

Semester - I

1-4. Techniques of quality assessment of fruits, vegetables, cereals, dairy products, meat, poultry, milk and other processed products.

5. Selection and training of sensory panel.

6. Hedonic rating of food.

7. Identification and ranking of food products attributes.

8. Sensory and Instrumental methods for measuring food attributes.

Books for Reference:

1. Imteaz Ali, *Food Quality Assurance, Principles and Practices*, CHIPS, Texas.
2. J.L.Multon, *Quality Control for Food and Agricultural Products*, CHIPS, Texas.
3. Amerine, M.A.Pangborn, R.M and Rosseler, *Principles of Sensory Evaluation of Food*, Academic Press, New York, 1965.
4. Birk, G.G.Berman, J.G and Parker, K.J, *Sensory Properties of Foods*, Applied Science, London, 1977.

5. Pattee, H.E, *Evaluation of Quality of Fruits and Vegetables*, AVI, Westport. 1985.
6. Ranganna S, *Handbook of Analysis and Quality Control-Fruits and Vegetables Products*, Tata Mc Graw Hill, New Delhi, 1986.
7. BIS Standards on Sensory Evaluation.

FOOD ADDITIVES - 1

Theory:

Unit-I:

Introduction to Food Additives – Types of additives with examples - benefits of additives - risks of additives, balancing risks & benefits - Functions and classification of food additives.

Unit-II:

Nutritional additives(fortificants/supplements), requirements (RDA and ADI), occurrence & commercial forms of various vitamins & minerals available. Antimicrobial agents – Application of benzoic acid & benzoates, Sorbic acid & sorbates, short chain acids & salts. Antibrowning agents – food applications.

Unit III:

Naturally occurring food additives, classification, role in food processing and health implications. Anti-oxidants and chelating agents, types and examples of anti-oxidants, their role in foods, natural and synthetic anti-oxidants - their mode of action in foods.

Unit IV:

Toxicology and Safety evaluation of food additives, beneficial/toxic effects, Generally Recognized As Safe (GRAS), tolerance levels and toxic levels in food. Preservatives - Natural and chemical preservatives and their chemical action on foods and human system.

Unit-V:

Food flavors – natural, nature identical, synthetic. Flavor enhancers, potentiators & applications. Flavoring materials made by processing. Applications of flavors in food industry.

Practicals:

Semester - I

1. Estimation of Chlorophyll content.
2. Estimation of Carotenoids.
3. Estimation of Colors from native source.
4. Estimation of total soluble solids using refractometer.
5. Estimation of NaCl in butter.
6. Estimation of NaCl in Pickles.

Books for Reference:

1. AL Branen, Davidson and S. Salminen, *Food Additives*. Marcel Dekker Inc NY 1990.
2. Swaminathan, *Food Science, Chemistry & Experimental Foods*. Bappco Publishers, Bangalore.

3. Mahindra S.N., *Food additives – Characteristics detection and estimation*. Tata Mc Graw Hill Publication Company, New Delhi.
4. Srivastav, R.P. and Sanjeev Kumar, *Fruit and Vegetable Preservation, Principles and Practice*. International Book Distribution Company, New Delhi.

FOOD TRADE AND BUSINESS MANAGEMENT - 1

Theory:

Unit-I:

Business Principles, Practices and Policies of Food trade. Mechanism of foreign exchange, WTO, GATT, International Trade in Agriculture, world consumption of food.

Unit-II:

Pattern and types of food consumption, APEDA, MOFPI, Spices Board, BIS etc, Food Marketing classification, Consumer behavior, demand and forecasting demand and marketing pigmentation.

Unit-III:

Product planning and linear programming, Sales promotion, break even analysis, Programme Evaluation and Review Technique. Social aspects of food marketing, Advertisings, features, objectives, effectiveness and components of advertisement.

Unit-IV:

Food plant layout & Process planning for the product, establishing the food product unit. Creativity and innovation problem solving. personnel management, salaries, wages and incentives, performance appraisal, quality control.

Unit-V:

Laws governing of food products, Role of consumers and role of food business people, formulation and selling of products. Food Marketing and Sales management.

Books for Reference:

1. D. David and S. Ericson, *Principles of Agri. Business Management*. Tata Mc Graw Hill Book Co., New Delhi.
2. P.K. Srivastava, *Marketing Management*. Himalaya Publishing House, New Delhi.
3. G.S. Batra and Narinder Kumar, *GATT implications of Denkel proposal*. Azmol Publications, New Delhi.