

SRI VENKATESWARA UNIVERSITY: TIRUPATI

IV SEMESTER - MINOR

Subject: Food Science & Technology

w.e.f. AY 2024-25

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	II	1	Food Biochemistry	3	3
			Food Biochemistry Practical Course	2	1
II	III	2	Food Microbiology	3	3
			Food Microbiology Practical Course	2	1
	IV	3	Food Additives and toxicology	3	3
			Food Additives and toxicology Practical Course	2	1
		4	Food Packaging	3	3
			Food Packaging Practical Course	2	1
III	V	5	Food Safety and Quality Control	3	3
			Food Safety and Quality Control Practical Course	2	1
		6	Baking Science & Technology	3	3
			Baking Science & Technology Practical Course	2	1

SEMESTER-IV
COURSE 3: FOOD ADDITIVES AND TOXICOLOGY

Theory

Credits: 3

3 hrs/week

Learning Objectives:

To familiarize with concepts of food additives and toxicology

Learning Outcomes: On successful completion of the course, students will be able to

LO1: To learn about the effective processing on vitamins.

LO2: To study about the flavoring agents & nutritional, preservatives.

LO3: To know about the food colors & sources.

LO4: To learn about the fruits & vegetables composition.

LO5: To understand milk and egg composition and processing effects

Unit – I

Vitamins - Classification, Structure, Sources, Functions, Deficiencies; Minerals- Types, Sources, Functions, Deficiencies, Effect of Processing on vitamins

Unit – II

Introduction to food additives- classifications, nutritional, preservatives/ antimicrobial agents, antioxidants, flavoring agents, sweeteners, enzymes, p^H controls agents and acidulants. Food additives and hypersensitivity. Risks and benefits of different food additives. Food dispersions, solutions, gels, emulsions and foams.

Unit – III

Food colours- sources of food colours, types with reference to natural and synthetic, properties/ reactions reference to processing, food applications. Food flavours- natural, natural identical and synthetic – Flavour enhancers and potentiators and applications

Unit – IV

Fruits & Vegetables Composition, Physico-Chemical Properties, Textural Components; Post Harvest Changes In Fruits And Vegetables- Respiration, Ripening, Colour and Textural Changes, Changes In Fats And Organic Acids.

Unit – V

Chemistry of milk and its constituents- compositions, effect of processing on constituents (heating, fermentation, freezing, homogenization); Egg- composition, proteins of egg, effects of processing on egg and their constituents.

References:

1. Food Chemistry : Mayer , CBS Publications
2. Food Chemistry : Fennema
3. Food Science : Sri Lakshmi
4. Food Science : Potter
5. Dairy Chemistry : Mathur
6. Food & Nutrition : M.S. Swaminathan Vol- I & II
7. Fruit & Vegetable Preservation
8. Principles & Practice : Srivastava R.P, III edition, IBDC Publishers

SEMESTER-IV

COURSE 3: FOOD ADDITIVES AND TOXICOLOGY

Practical

Credits: 1

2 hrs/week

1. Estimation of crude fiber
2. Estimation of Chlorophyll content
3. Estimation of carotenoids
4. Extraction of colors from native source
5. Estimation of calcium in foods
6. Estimation of iron in foods
7. Estimation of total soluble solids using refractometer
8. Estimation of NaCl in butter, pickles and processed foods
9. Estimation of energy content in Foods
10. Visit to food industry / Quality Control lab
11. Fruit & Vegetable Preservation

SEMESTER-IV
COURSE 4: FOOD PACKAGING

Theory

Credits: 3

3 hrs/week

Learning Objective:

To familiarize with the concepts of food packaging

Learning Outcomes:

Upon successful completion of the course, a student will be able to:

LO1: To understand about packing methods of food & preservation.

LO2: To study about food packing materials.

LO3: To understand flexible packing materials.

LO4: To know the evaluation of packing material & packing performance.

LO5: To understand about recent trends in packing

Unit – I

Introduction to packaging: Packaging operation, package-functions and design, Principle in the development of protective packaging, Deteriorative changes in food stuff , packaging methods for prevention, shelf life of packaged foodstuff, 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, other traditional package

UNIT- III

Flexible packaging materials and their properties; Paper, metal foils, polymers, and laminates, Packaging additives, Considerations in the packaging of perishables and processed foods, Aluminum as packaging material

UNIT-IV

Evaluation of packaging material and package performance, packaging equipment, Metering and filling of different foods, Aseptic filling of foods, Labeling requirements, Bar coding- Printing, package standards and regulation

UNIT-V

Trends in latest packaging, Modified Atmospheric Packing (MAP), Controlled Atmospheric Packaging (CAP), Oxygen scavengers, Shrink packaging, aseptic and retortable pouches , Flexible and laminated pouches, Biodegradable packaging, Active packaging, Packaging of different food materials- Fruit and vegetables, meat, milk and egg, products, oils, RTE foods¹

References

1. Painy, F.A. and Painy, H.Y. “A Handbook of Food Packaging” Leonard Hill, Glasgow, UK.1983.
2. Food Packaging. : Westport. Scicharow, S. and Griffin, R.C. 1970.
3. Principles of Food packaging: Stanley Sacharow
4. Food packaging and preservation: Mathlouthi
5. Food packaging (Principles & Practices): Gordan L Robertson
6. Principles of food packaging: Heiss . R
7. Packaging of food Beverages: Day F T

SEMESTER-IV
COURSE 4: FOOD PACKAGING

Practical

Credits: 1

2 hrs/week

- Identification of different types of packaging materials
- Determination of following properties on different packaging materials
 - a) Tensile strength
 - b) Tearing resistance
 - c) Impact test
 - d) Compression resistance
 - e) Sealing strength
 - f) Chemical stability
 - g) Dimensional stability
 - h) Gas transmission rate
 - i) Water vapour transmission rate
 - j) Grease resistance
 - k) Grammage (GSM)
 - l) Bursting strength
- Physical properties of paper
- Determination of tin coating, weight and porosity
- Vacuum/ gas/shrink packaging of food products
- Performance evaluation of transport packages
- Shelf life studies of packaged foods
- Design of labels for food packages