SRI VENKATESWARA UNIVERSITY: TIRUPATI

Programme: B.Sc. Honours in Food Science & Technology (Major)

w.e.f. AY 2023-24

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Introduction to Food Science and Nutrition	3+2	4
		2	Health, Hygiene & Wellness	3+2	4
	II	3	Food Biochemistry	3	3
			Food Biochemistry Practical Course	2	1
		4	Human Nutrition	3	3
			Human Nutrition Practical Course	2	1
II	III	5	Food Microbiology	3	3
			Food Microbiology Practical Course	2	1
		6	Chemistry of Fats and oils	3	3
			Chemistry of Fats and oils Practical Course	2	1
		7	Diary Technology	3	3
			Diary Technology Practical Course	2	1
		8	Confectionery Technology	3	3
			Confectionery Technology Practical Course	2	1
	IV	9	Food Additives and toxicology	3	3
			Food Additives and toxicology Practical Course	2	1
		10	Food Packaging	3	3
			Food Packaging Practical Course	2	1
		11	Technology of Cereals Pulses and Oil Seeds	3	3
			Technology of Cereals Pulses and Oil Seeds Practical Course	2	1
III	V	12	Food Safety and Quality Control	3	3
			Food Safety and Quality Control Practical Course	2	1
		13	Baking Science & Technology	3	3
			Baking Science & Technology Practical	2	1

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
			Course		
		14A	Technology of Meat, Fish Poultry and their Products	3	3
			Technology of Meat, Fish Poultry and their Products Practical Course	2	1
		OR			
		14 B	Food Process engineering	3	3
			Food Process engineering Practical Course	2	1
		15 A	Technology Fruits, Vegetable and Plantation Crops	3	3
			Technology Fruits, Vegetable and Plantation Crops Practical Course	2	1
		OR			
		15 B	Fermentation Technology	3	3
			Fermentation Technology Practical Course	2	1
	VI	**Internship**			
	VII		Courses will be available in due course of time		
	VIII		Courses will be available in due course of time		

SEMESTER-IV

COURSE 9: 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 potentiaters 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 & Practic : Srivastava R.P, III edition, IBDC Publishers

SEMESTER-IV

COURSE 9: 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 10: 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 10: 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) Impart 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

SEMESTER-IV

COURSE 11: TECHONOLOGY OF CEREALS PULSES AND OIL SEEDS

Theory Credits: 3 3 hrs/week

Learning Objectives

To understand the concepts of processing, value addition of pulses, cereals and oil seeds.

Learning Outcomes

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

LO 1 Student will have basic knowledge of Cereals Pulses and oil seeds

LO 2 Student will learn how to Mill cereals pulses and oil seeds at home scale, and large scale

LO 3 Student will learn about changes occurring during processing of Cereals Pulses and oil seeds

LO 4 Student will learn about various processing Technologies

LO 5 Student will learn how to prepare value added products from Cereals Pulses and oil waste

Unit 1

Present status and future prospects of legumes and oilseeds; Morphology of legumes and oilseeds; Classification and types of legumes and oilseeds Chemical composition, nutritional value and anti-nutritional compounds in legumes and oilseeds; Methods of removal of anti-nutritional compounds

Unit 2

Pulse milling: Home scale, cottage scale and modern milling methods, machines, milling quality, milling efficiency Factors affecting milling quality and quantity; Problems in dhal milling industry.

Oil seed milling: Ghanis, hydraulic presses, expellers, solvent extraction methods, machines, Milling quality, milling efficiency, factors affecting milling quality and quantity; Problems in oil milling industry;

Unit 3

Nutritional changes during soaking and sprouting of pulses; Cooking quality of dhal, methods, factors affecting cooking of dhal; Quick cooking dhal, instant dhal; Soybean milk processing and value addition; Fermented products of legumes.

Unit 4

Desolventization Refining of oils: Degumming, neutralization, bleaching, filtration, deodorization, winterization and their principles and process controls; Hydrogenation of oils; New technologies in oilseed processing.

Unit 5

Utilization of oil seed meals for different food uses: High protein products like protein concentrates and isolates; By-products of pulse and oil milling and their value addition.

Reference

Guriqbal Singh, Harbhajan Singh Sekhon, Jaspinder Singh Kolar and Masood Ali. 2005. Pulses. Agrotech Publishing Academy, Udaipur.

A. Chakraverty. 2008. Post Harvest Technology of Cereals, Pulses and Oilseeds, 3rd Ed. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.

Frank D. Gunstone. 2008. Oils and Fats in the Food Industry. John Wiley and Sons, Ltd., West Sussex, UK.

Fereidoon Shahidi. 2005. Bailey's Industrial Oil & Fat Products, 6th Ed., Vols. 1 to 6. John Wiley and Sons, Inc. Hoboken, New Jersey, USA.

Amalendu Chakraverty, Arun S. Mujumdar, G.S. Vijaya Raghavan and Hosahalli S. Ramaswamy. 2003. Handbook of Post Harvest Technology: Cereals, Fruits, Vegetables, Tea, and Spices. Marcel Dekker, Inc., NY, USA.

K.M. Sahay and K.K. Singh. 2001. Unit Operations of Agricultural Processing, 2nd Ed. Vikas Publishing House Pvt. Ltd., Noida.

SEMESTER-IV

COURSE 11: TECHONOLOGY OF CEREALS PULSES AND OIL SEEDS

Practical Credits: 1 2 hrs/week

1.Chemical analysis of select spices: Moisture, valuable oil,

2 Physical analysis of select spices: specific gravity, refractive index, acid value

3 Identification and characterization of flavouring compounds of spices

4 Valuable oil determination

5 Extraction of oil from clove/ pepper

6 Extraction of oil from cardamom/ chilli

7 Extraction of oleoresins: Turmeric/ ginger, pepper, clove

8 Extraction of oleoresins: pepper/ clove

9 Peperine estimation in pepper oleoresin

10 Steam distillation of spices

11 Determination of curcumin content in turmeric

12 Study of standard specification of spices

13 Packaging study of spices

14 Preparation of curry powder

15 Extraction of active ingredients by TLC, HPLC and GC