SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

DEPARTMENT OF BIOTECHNOLOGY	
~~B.E/B.Tech/M.E/M.Tech~~ : B.E and B.Tech (Common to all branches except Biotechnology)	LP: OE18202
Regulation : 2018A	Rev. No: 00
PG Specialisation : NA	Date:
Sub. Code / Sub. Name : **OE18202 / INTRODUCTION TO FOOD MANUFACTURING**	02/01/2024
Unit : 1	

Unit Syllabus: REFRIGERATION AND FREEZING **9h**

Requirements of refrigerated storage, controlled low temperature, air circulation and humidity, changes in food during refrigerated storage, progressive freezing, changes in the food during refrigeration and freezing, freezing methods - direct and indirect, still air sharp freezer, blast freezer, fluidized freezer, plate freezer, spiral freezer and cryogenic freezing.

Objective: To introduce the basics of various food processing techniques.

Session No *	Topics to be covered	Ref	Teaching Aids
1.	Requirements of Refrigerated Storage	TB3 (1-2)	Animations & BB
2.	Controlled Low Temperature in Food Storage	TB3 (2-5)	PPT & BB
3.	Air Circulation and Humidity in Refrigeration	TB3 (11)	Animations & BB
4.	Changes in Food During Refrigerated Storage	TB3 (6-7)	PPT & BB
5.	Progressive Freezing in Food Preservation	TB3 (7)	PPT & BB
6.	Changes in Food During Freezing	TB3 (7-10)	Animations & BB
7.	Freezing Methods: Direct and Indirect Approaches	TB3 (18-19)	PPT & BB
8.	Various Freezing Equipment: Still Air Sharp Freezer, Blast Freezer, Fluidized Freezer, Plate Freezer, Spiral Freezer	TB1 (18-20) RB2 (6-8)	PPT & BB
9.	Cryogenic Freezing: An Overview	TB2 (19-24) RB1 (7-11)	Animations & BB
Content beyond syllabus covered (if any): NIL			

* Session duration: 50 minutes

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Sub. Code / Sub. Name : **OE18202 / INTRODUCTION TO FOOD MANUFACTURING**

Unit : 2

Unit Syllabus: DRYING AND DEHYDRATION **9h**

Normal drying curve, effect of food properties on dehydration, changes in food during drying, drying methods, air convection dryer, tray dryer, tunnel dryer, continuous belt dryer, fluidized bed dryer, drum dryer, vacuum dryer, freeze dryer, foam mat dryer.

Objective: To introduce the basics of various food processing techniques.

Session No *	Topics to be covered	Ref	Teaching Aids
10.	Normal Drying Curve	TB1 (7-9) RB1 (11-14)	PPT & BB
11.	Effect of Food Properties on Dehydration	TB1 (11-13) RB1 (16-19)	Animations & BB
12.	Changes in Food During Drying	TB3 (16-17)	PPT & BB
13.	Drying Methods Overview	TB3 (18-19)	Animations & BB
14.	Air Convection Dryer	TB1 (20-24) RB2 (8-12)	PPT & BB
15.	Tray Dryer	TB2 (28-30) RB1 (11-14)	PPT & BB
16.	Tunnel Dryer	TB2 (44-46) RB2 (32-38)	Animations & BB
17.	Continuous Belt Dryer	TB2 (81-84) RB1 (69-72	PPT & BB
18.	Various Specialized Dryers: Fluidized Bed Dryer, Drum Dryer, Vacuum Dryer, Freeze Dryer, Foam Mat Dryer	TB2 (101-104) RB2 (121-124)	PPT & BB
Content beyond syllabus covered (if any): NIL			

* Session duration: 50 mins

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Sub. Code / Sub. Name : **OE18202 / INTRODUCTION TO FOOD MANUFACTURING**

Unit : 3

Unit Syllabus: **THERMAL PROCESSING OF FOODS** **9h**

Classification of thermal processes, principles of thermal processing, commercial canning operations, Pasteurisation, blanching, irradiation and microwave heating - principles, dosage, applications and mechanism

Objective: To introduce the basics of various food processing techniques.

Session No *	Topics to be covered	Ref	Teaching Aids
19.	Classification of Thermal Processes	TB4 (107-110) RB3 (44-46)	Animations & BB
20.	Principles of Thermal Processing	TB4 (111-115) RB3 (47-48)	PPT & BB
21.	Commercial Canning Operations	TB4 (116-117) RB3 (48-49)	PPT & BB
22.	Pasteurization Overview	TB4 (107-110) RB3 (50-51)	Animations & BB
23.	Blanching Techniques	TB4 (111-114) RB3 (51-53)	PPT & BB
24.	Principles of Irradiation	TB4 (114-115) RB3 (53-55)	PPT & BB
25.	Dosage in Food Irradiation	TB4 (115-117) RB3 (56-58)	Animations & BB
26.	Applications of Microwave Heating	TB4 (114-119) RB3 (59-60)	PPT & BB
27.	Mechanism of Microwave Heating	TB4 (120) RB3 (60-61)	PPT & BB
Content beyond syllabus covered (if any): NIL			

* Session duration: 50 mins

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Sub. Code / Sub. Name : **OE18202 / INTRODUCTION TO FOOD MANUFACTURING**

Unit : 4

Unit Syllabus: **MINIMAL PROCESSING AND HURDLE TECHNOLOGY 9h**

Principles and applications, hurdle effect in fermented foods, shelf stable products, intermediate moisture foods, application of hurdle technology. Minimal processing of foods with thermal methods and non-thermal methods, criteria in minimally processed foods, Minimal processing in practice and future developments.

Objective: To enhance the knowledge on minimal processing and hurdle technology.

Session No *	Topics to be covered	Ref	Teaching Aids
28.	Principles and Applications of Food Processing	TB3 (14-18)	Animations & BB
29.	Hurdle Effect in Fermented Foods	TB3 (18-19) RB3 (65)	Animations & BB
30.	Shelf Stable Products in Food Industry	TB3 (20-24) RB3 (66-67)	PPT & BB
31.	Intermediate Moisture Foods	TB3 (25-27) RB3 (68)	PPT & BB
32.	Application of Hurdle Technology	TB3 (28-32)	PPT & BB
33.	Minimal Processing of Foods with Thermal Methods	TB3 (33-37) RB3 (72-74)	Animations & BB
34.	Minimal Processing of Foods with Non-Thermal Methods	TB3 (37-39) RB3 (75)	PPT & BB
35.	Criteria in Minimally Processed Foods	TB3 (40-47)	PPT & BB
36.	Minimal Processing in Practice and Future Developments	TB3 (47-49) RB3 (76-77)	PPT & BB

Content beyond syllabus covered (if any): NIL

* Session duration: 50 mins

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Sub. Code / Sub. Name : **OE18202 / INTRODUCTION TO FOOD MANUFACTURING**

Unit : 5

Unit Syllabus: **FOOD ADDITIVES, CONTAMINANTS AND REGULATION 9h**

Need of food additives in food processing and preservation, characteristics and classification of food additives, chemical, technological and toxicological aspects. Contamination in Food - physical, chemical (heavy metals, pesticide residues, antibiotics, veterinary drug residues, dioxins, environmental pollutants, radionuclide, solvent residues), natural toxins. Food laws and regulations - Codex, HACCP, ISO, FSSAI etc.,

Objective: To understand the role of food additives in food industry.

Session No *	Topics to be covered	Ref	Teaching Aids
37.	Need of Food Additives in Food Processing and Preservation	TB5 (16-19) RB3 (21-27)	PPT & BB
38.	Characteristics of Food Additives	TB5 (21-27) RB3 (30-33)	PPT & BB
39.	Classification of Food Additives	TB4 (111-120) RB3 (35-38)	Animations & BB
40.	Chemical Aspects of Food Additives	TB4 (121-124) RB3 (29-41)	Animations & BB
41.	Technological Aspects of Food Additives	TB4 (121-125) RB3 (42-44)	PPT & BB
42.	Toxicological Aspects of Food Additives	TB4 (114-119)	PPT & BB
43.	Contamination in Food: Physical Contamination, Chemical Contamination, (Heavy Metals, Pesticide Residues, Antibiotics, Veterinary Drug Residues, Dioxins, Environmental Pollutants, Radionuclide, Solvent Residues), Natural Toxins	TB4 (128-131) RB3 (42-47)	Animations, BB & YouTube Video
44.	Food Laws and Regulations Overview	TB4 (121-125) RB3 (47-49)	PPT & BB
45.	International Standards: Codex, HACCP, ISO, FSSAI, etc.	TB4 (119-121)	PPT & BB
Content beyond syllabus covered (if any): NIL			

* Session duration: 50 mins

Sub. Code / Sub. Name : **OE18202 / INTRODUCTION TO FOOD MANUFACTURING**

REFERENCES:

Text Books:

1. Potter N.N, and Hotchkiss J.H, "Food Science", 5th Edition, Asben Publications, 1998
2. Ramaswamy H, and Marcotte M, "Food Processing: Principles and Applications", 2nd Edition,CRC Press, 2009.
3. Deman J.M, "Principles of Food Chemistry", 3rd Edition, Springer, 2007.
4. Manay N.S, and Shadaksharaswamy M, "Food - Facts and Principles", 2nd Edition, New Age International Pvt. Ltd. Publishers, 2001.

Reference Books:

1. Romeo T.T, Singh R.K, and Kong F, "Fundamentals of Food Process Engineering", 4th Edition,Springer, 20182.
2. Rao D.G, "Fundamentals of Food Engineering", PHI Learning Pvt. Ltd., 2010.
3. Desrosier N.W, and Desrosier J.N, "The Technology of Food Preservation", 4th Edition, CBS Publishers, 1998.
4. Bawa A.S, Raju P.S, and Chauhan O.P, "Food Science". New India Publishing Agency, 2013.

YouTube Video:

1. https://www.youtube.com/playlist?list=PLODKZZeKAWb-PMMqRrD4hNUG4v7bkVbt1

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