

5266 – SOFT DRINK & PACKAGING TECHNOLOGY

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)				
Lectures	Practical	Credits			Theory		Practical Ex.	Total	
4	2	6	50	-	3hrs	100	-	150	
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total
Nil		FOD		75	25	100	50	-	150

Rationale: Soft drink industry is a prominent sector among the food industries. There is plenty of scope for employment within the country as well as overseas. It also encourages students for self employment at a small scale level. The syllabus of soft drink technology equips the students to handle Production, Quality Control and even selection of raw materials.

COURSE CONTENTS		Hrs	Mks
1. INTRODUCTION: History, Definition. Legal standards and specifications. Nutritive value of soft drinks. Classification of soft drinks.		2	5
2. INGREDIENTS USED IN SOFT DRINKS: Various ingredients used, including stimulants, antioxidants, vitamins and buffer salts. Their quality characteristics. Nutritive value of different ingredients. Permitted levels. Importance of Brix : acid ratio. Storage and handling of ingredients.		4	10
3. WATER TREATMENT AND SPECIFICATIONS: Sources of water. Composition of water. Different water treatment methods such as: Filtration, chemical treatment, Ion exchange, demineralisation, reverse osmosis, deodorization, U. V. rays. Water specifications.		7	10
4. SWEETENERS: Function of Sweeteners. Nutritive sweeteners: sucrose, glucose, cornsyrup, glucose, highfructose cornsyrup, sorbitol, fructose, lactose, their properties, advantages and disadvantages. Non nutritive sweeteners: Saccharine, cyclamates, acesulfamek, aspartame – their properties, advantages and limits. High intensity sweeteners: Alitame, sucralose.		3	6
5. ACIDULANTS: Functions. Different types of acids used, properties, level used. Equivalent sourness produced.		2	5
6. COLOURANTS, FLAVOURS, PRESERVATIVES AND OTHER ADDITIVES Natural, Nature identical, synthetic, flavour extracts, essential oils, emulsions, caffeine. Preservatives: Preservative action of various ingredients, various chemical preservatives used. Antioxidants like BHA, Ascorbic acid. Hydrocolloids: Carageena, alginates and polysaccharides – their functions and levels used.		5	8

7. CARBON DIOXIDE: Properties of CO ₂ gas. Specifications. CO ₂ gas treatment. Gas volume in various soft drinks.	5	8
8. COMPOSITION OF SOFT DRINK: Composition of various carbonated, non-carbonated, fruit based and energy drinks.	3	6
9. SOFT DRINK PRODUCTION: Plant layout. Preparing of carbonated soft drink. Preparing of non carbonated soft drink. Aseptic packaging of soft drink. Plant sanitation and housekeeping.	8	10
10. QUALITY CONTROL IN SOFT DRINKS: Quality standards for sugar and acids. Online quality control. Tests for treated water, syrup clarity, inspection of washed bottles, inspection of filled bottles, gas volume, brix organoleptic tests, etc. Microbiological tests for water, syrup, washed bottles and beverage. Quality test for finished product brix, gas volume, acidity, invert sugar, organoleptic tests, etc.	6	12
PACKAGING:		
11. PROPERTIES, ADVANTAGES AND LIMITATIONS OF THE FOLLOWING PACKAGING MATERIALS: Glass, Aluminium cans, laminates, PET, Retortable Pouches, open top sanitary cans.	10	10
12. USE OF PACKAGING MATERIALS Packaging materials used and criteria for selection of packaging materials for Beverages.	5	5
13. TESTING, IDENTIFICATION AND ESTIMATION OF PACKAGING MATERIAL: Testing and identification of packaging material. Estimation of shelf - life of packaged foods.	4	5
Total	64	100

PRACTICALS:

1. Identification and qualitative analysis of citric, malic, fumaric, phosphoric acids.
2. Analysis of sugar: Moisture, Flocculation test, Sedimentation, Colour, Turbidity, Odour, ash.
3. Qualitative tests for buffer and preservatives.
4. Qualitative tests for caramel Density, Colour, Solubility, Stability.
5. Water analysis: Iron residue, chlorine tests, total hardness, total dissolved solids, total alkalinity, P & M Value.
6. Testing of gas-volume, brix, invert sugar, acidity, total volume - of any two soft drinks available in the market.

REFERENCE BOOKS:

1. Formulation and Production of Carbonated soft drinks, Edited by, A. J. Mitchell
2. Production and Packaging of Non Carbonated Fruit Juices and Fruit Beverages, Edited by, D. Hicks
3. Beverage Carbonated & Non Carbonated, Edited by, Woodroof & Phillips
4. Food Packaging, Edited by Stanley Sacharow
5. Fundamentals of Food Packaging, Edited by F. A. Patne
6. Food Packaging & Preservation, Edited by, M. Mathlouthi
7. Food Packaging, Edited by Takashi Kadoya

X