

4266-METHODS OF FOOD PRESERVATION – I										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credits			Theory		Practical Ex.		Total	
3	2	5	25	25	3Hrs	100	-	-	150	
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total	++
4261		FOD		75	25	100	50	-	150	

**Rationale:** Food preservation is an essential subject in Food Technology, which forms the basis of all processing technologies taught in the higher semesters. This subject has been covered in two parts. In the first part, the students will be made aware of different food spoilage, spoilage agencies and spoilage processes. Subsequently they will be exposed to the different principles of preservation. Due weight age also has been given to the traditional methods of preservation, insects in stored grains, their control and improved methods of grain storage in warehouses, with reference to tropical conditions. The topics in theory are supplemented with practical work aimed at developing the skills in preserving the food by an adequate method.

#### COURSE CONTENT

	Hrs	Mks
<b>1. FOOD SPOILAGE</b>	8	12
Perishability of foods and contamination. Types of spoilage: Physical – moisture absorption, desiccation, mechanical injury. Chemical spoilage- Changes in chemical composition due to oxygen, light, etc. Biochemical spoilage- Due to enzymes present in food, or from external agency (insect, micro-organisms). Contamination by dirt, dust, chemical, rodents, etc.		

<b>2. TRADITIONAL METHODS OF PRESERVATION</b>	4	8
Use of sugar, salt, drying, smoking, and curing.		
<b>3. PRESERVATION OF LOW MOISTURE FOODS</b>	14	30
Spoilage of food grain- physical, biological and chemical. Spoilage insects of stored grain and flour, (beetles, weevils and moths). Techniques in detecting grain infestation. Insect control methods- Traditional methods. Chemical methods – Use of insecticides and fumigants, properties, dose, method of application, toxicity. Rodent control methods- Methods of grain storage- Traditional and improved methods. Modern warehouses, storage, principles and engineering aspects.		
<b>4. METHODS OF FOOD PRESERVATION</b>	22	50
Cold storage – Principle, cold storage of fruits and vegetables, specific heat, heat of respiration, refrigeration requirements, refrigeration load.		
Modified gas storage – Principles.		
Freezing of foods- Principles, pre-treatments. Methods of freezing-slow v/s quick-freezing. Changes during freezing thawing, drip – loss.		
Dehydration- Principles and pre-treatment required. Sun drying and mechanical drying. Advantages and limitations of different mechanical dehydrators. Dehydration and Re-hydration ratio. Case hardening and texture losses. Freeze drying – Triple point, applications. Concentration – Principle. Recent advances, osmotic dehydration, freeze concentration, microwave dryers.		
Irradiation - Principles, advantages. Comparison with other methods of preservation. Action of irradiating rays - Direct effects and indirect effects, Irradiation sources. Units of irradiation. Electron accelerators. Attempts to limit indirect effects. Gross effect of Irradiation. Safety and wholesomeness of irradiated foods. Irradiation dose, determining factors. Dosimeters.		
Fermentation- Principle and definition. Additional benefits from fermentation.		
Controlling fermentation in various foods.		
<b>Total</b>	48	100

**PRACTICALS**

- 1) Detection of spoilage in food
- 2) Demonstration of enzymatic browning in food and its effect on product quality
- 3) Study of dehydration and re-hydration ratio
- 4) Dehydration of mango pulp
- 5) Examination of insect in stored grain
- 6) Detection and estimation of insect, infestation of food grain
- 7) Demonstration of infestation control, handling of different appliances
- 8) Visit to government ware house
- 9) Demonstration of effect of sulphuring before processing
- 10) Storage, study of fruits –waxing. Pre-packaging
- 11) Preservation of mango slices in brine
- 12) Dehydration of potato chips
- 13) Preparation and analysis of brine

**REFERENCE BOOKS**

6. Food Science by Potter
7. Grain Storage Part I by R.N.Sinha.
8. Handling & Storage of Food Grain in Tropical and Sub-tropical Areas by D. W. Hall
9. Fundamental of Food Freezing by Norman W. Desrosier.

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