

M.E Semester: 3 Mechanical Engineering (Thermal Engineering)
Subject Name: FOOD PROCESSING, PRESERVATION AND TRANSPORT

A. Course Objective

- To present a problem oriented in depth knowledge of Food Processing, Preservation And Transport
- To address the underlying concepts and methods behind Food Processing, Preservation And Transport

B. Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PRACT.	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
METH303-A	Food processing, Preservation and Transport	3	0	0	3	3	3	70	30	20	0	120

C. Detailed Syllabus / Lesson Planning

1 INTRODUCTION

Microbiology of Food Products – Mechanism of food spoilage critical microbial growth requirements – Design for control of micro organisms – The role of HACCP – Sanitation – Regulation and standards

2 PROCESSING & PRESERVATION

Thermodynamic properties and Transfer properties – Water content – Initial freezing temperature – Ice fraction – Transpiration of fresh fruits & vegetables – Food processing techniques for Dairy products, Poultry, Meat, Fruits & Vegetables

3 FREEZING & DRYING

Pre-cooling – Freeze drying principles – Cold storage & freezers – Freezing drying limitations – Irradiation techniques – Cryofreezing – Numerical and analytical methods in estimating Freezing, Thawing times, Energy conservation in food industry.

4 COLD STORAGE DESIGN & INSTRUMENTATION

Initial building consideration – Building design – Specialized storage facility – Construction methods – Refrigeration systems – Insulation techniques – Control & instrumentation – Fire protection – Inspection & maintenance

5 TRANSPORT

Refrigerated transportation – Refrigerated containers & trucks – Design features – Piping & Role of cryogenics in freezing & transport

D. Detailed Syllabus / Lesson Planning

Sr.No.	Date/Week	Unit No.	% Weightage	Topic No:
1	1 st , 2 ^{ed} , 3 ^{ed}	Unit 1	20 %	1
2	4 th , 5 th , 6 th	Unit 2	20 %	2
3	7 th , 8 th , 9 th	Unit 3	20 %	3
4	10 th , 11 th , 12 th	Unit 4	20 %	4
5	13 th , 14 th , 15 th	Unit 5	20 %	5

E. Instructional Method & Pedagogy

1. At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
2. Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.

3. Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4. One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
5. Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6. Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.

F. Students Learning Outcomes

- The student can identify different areas of Food Processing, Preservation And Transport
- Can find the applications of all the areas in day to day life.

G. Recommended Study Materials

• **Text & REFERENCES**

1. Alan Rodes, "Principles of Industrial Microbiology", Pregmon International Pub., 1989
2. IbrahimDincer, "Heat Transfer in Food Cooling Applications", Tailor & Francis Pub., 1997
3. Stanley E. Charm, "Fundamentals of Food Engineering', III Ed. AVI Pub. Company Inc., 1989
4. Clive V.I. Dellino, "Cold and Chilled Storage Technology", Van Nostrand Reinhold Pub., New York, 1991
5. Arora C.P., "Refrigeration and Air conditioning", Second Edition. McGraw-Hill, Pub., 2000
6. ASHRAE Handbook, Refrigeration, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Atlanta, 1988

