

LECTURE SCHEDULE

Department: Dairy Engineering

Course No. - DTE- 323

Course Title: Dairy Plant Design and Layout Credit Hrs - 2 (1+1)

Course Teacher: Dr. Jahangir Badshah

Theory

S. No.	Topics to be covered	No. of Classes
1	Definition and types of Plant layout. Principles of Dairy Plant layout. Contamination in dairy Plant, Perishable nature of milk, reception of milk and reception flexibility. Hygienic design considerations for dairy processing plants.	02
2	Classification of dairy Plant depending upon function and location. Factors affecting location of plant and factors affecting site selection of dairy plant.	02
3	Importance of Planning, survey of the procurement and marketing areas, Product – Price mix planning, Projected mass balance chart planning.	02
4	Process Flow Diagram Planning for Dairy processing and Utilities requirements. Space requirement for dairy Plants and dairy Building planning. Service accommodation, single or multilevel design.	02
5	Estimation of Steam, Refrigeration, and water utilities.	02
6	Estimation of Electrical load, transformer and generator requirement. Study of Power factor and electrical energy conservation.	01
7	Dairy plant design aspects: General points of considerations for designing dairy plant, Arrangement of different sections in dairy, sitting the process sections, utility/service sections, offices and workshop. Arrangement.	02
8	Arrangement of equipment, milk piping, material handling in dairies, Common problems, office layouts-flexibility. Development and presentation of layout, model planning, use of planning table in developing plot plant and detailed layout.	02
9	Building construction materials: Floors, general requirement of dairy floor finishes, floors for different section of dairy. Foundations, walls doors and windows.	02
10	Other design aspects: Drains and drain layout for small and large dairies. Ventilation, fly control, Mold prevention, illumination in dairy plants.	01
11	Design of Cold Storage for dairy plant.	01
12	Computer aided Design: Introduction to CAD software.	01
	Total	20

Practical (DTE -323)

S. No.	Practical to be covered	No. of Classes
1	Drawing of Building symbols and convention.	01
2	Drawing of Symbols of Dairy Plant Equipments	02
3	Study of Product – Price mix, Projected mass balance chart preparations and Process schedules of Processing and manufacturing of products.	02
4	Preparation of steam load diagram.	01
5	Preparation of Refrigeration Load diagram, Chilled water requirement, IBT requirement and Cold Storage and Frozen room requirement.	02
6	To draw layout of Chilling Centre.	01
7	Visit to Dairy Processing Plant and Understanding the Layout of different sections separately and on the whole.	02
8	To draw layout of small dairy plant. To draw layout of small dairy plant using CAD.	02
9	To draw layout of medium dairy plant.	01
10	To draw layout of large dairy plant. To draw layout of cheese plant.	01
11	To draw layout of ice-cream plant.	01
12	To draw layout of butter manufacturing unit. To draw layout of ghee plant.	01
13	To draw layout of composite dairy plant.	01
	Total	18

Suggested Reading:

1. Textbook of Dairy Plant Layout and Design by Lalat Chander (2005), Published by Directorate of Information and Publications of Agriculture (ICAR), Krishi Anushandhan Bhavan I, Pusa, New Delhi.
2. Dairy Plant Engineering and Management by Tufail Ahmand,(2012), Kitab Mahal Publisher.
3. FAO Handbook of Plant Layout, Publisher: FAO.