



# COOLING TECHNOLOGY: WHY AND HOW UTILIZED IN FOOD PROCESSING AND ALLIED INDUSTRIES

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**INTENDED AUDIENCE :** Agricultural Engineering, Food Technology, Food Engineering, Chemical Engineering, Biotechnological Engineering, Thermal Engineering, Biotechnology

**INDUSTRY SUPPORT :** Any Processing Industry such as ITC, Hindustan Lever, Britannia etc.

## **COURSE OUTLINE :**

This course will cover basics of processing and preservation technologies required in any processing industries. The basic knowledge on thermal processing is intermingled with most of the unit operations at some or other stage of processing. Since, these basic aspects of thermal operations are not taught in most of the engineering institutions elaborately, a comprehension of these aspects of thermal processing will enrich the knowledge base of the students in general.

## **ABOUT INSTRUCTOR :**

Prof. Tridib Kumar Goswami, a NAAS, ISAE, IE, AABS Fellow, did his B.Sc. in Chemistry (Hons) from University of Calcutta, B.Tech. in Food Technology and Biochemical Engineering from Jadavpur University, Ph.D. from IIT Kharagpur. After serving Kwality Ice Cream, Bombay for 1½ years, he joined IIT Kharagpur in 1989 and is still continuing as a Professor. He has earned 7 Indian Patents, published 180 papers in peer reviewed reputed journals, 59 conference proceedings. He has written 4 books and 20 book chapters published by International publishers. He has travelled around the world for presenting papers and was specially invited by Jeonbuk National University, Korea with full sponsorship in 2009. He has guided 18 Ph.D., out of which 3 theses have been awarded the prestigious Jawaharlal Nehru Award offered by ICAR. One of his papers was awarded the prestigious N.N. Mohan Memorial Award for 2009 conferred by AIFPA, New Delhi for Best Paper of the year. He has also received several National and International awards. He has completed several sponsored research & consultancy projects as PI and co-PI. He is the first faculty from Agricultural Engineering discipline in India to contribute to the National program on technology enhanced learning.

## **COURSE PLAN :**

**Week 1:** Fundamentals of food processing and preservation

**Week 2:** Cooling load calculations including heat of respiration

**Week 3:** Psychrometry

**Week 4:** Basics of thermodynamics

**Week 5:** Carnot cycle

**Week 6:** Reverse Carnot cycle

**Week 7:** Refrigeration and air-conditioning

**Week 8:** Vapour compression refrigeration cycles

**Week 9:** Compressor, Condenser, Expansion device, Evaporator

**Week 10:** Freezing and Freeze Drying

**Week 11:** Cold Storage

**Week 12:** A product of low temperature: Ice cream