

## **16:400:507 Food Engineering Fundamentals (4 credits)**

**Instructor-in-Charge:** Prof. Mukund V. Karwe

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### **Topics Covered**

Introduction, Engineering Units  
Material Balance (Steady State and Unsteady State)  
Thermodynamics, Psychrometry  
Energy Balance  
Rheology Foods  
Flow of Fluids  
Steady State and Unsteady State Heat Transfer  
Reaction Kinetics  
Thermal Processing of Foods  
Food Freezing  
Food Evaporation  
Steady State and Unsteady State Mass Transfer  
Moisture diffusion in Packaging Films  
Food Dehydration  
Introduction to Non-thermal processes for food Preservation

**NOTE:** Most topics are covered at basic introductory level. We may or may not be able to cover all the listed topics depending on the pace of the class.

### **Expected Outcomes**

- To understand physical principles and engineering approximations to mathematically describe a food processing operation.
- To be able to break down a problem into parts so that one can apply the principles and approximations so as to solve the problem.
- To be able to do quantitative analysis accurately.
- To be able to integrate knowledge from various topics.
- To be able to interpret the results of the analysis and make a judgment on the answer.

### **Assessment**

- Weekly homework.
- Several quizzes, conceptual, closed-book.
- Three tests, increasing weightage.
- Quantitative accuracy.
- Correct approach and methodology.
- Organization, neatness, and clarity.