<p style="text-align:center">**16:400:507 Food Engineering Fundamentals (4 credits)**
<u>Instructor-in-Charge:</u> Prof. Mukund V. Karwe
e-mail: mkarwe@sebs.rutgers.edu
Office: Room 221, Food Science and Nutritional Sciences Building (East), Cook Campus</p>

Prerequisite courses: First Year college level physics and mathematics (calculus) courses. If you have NOT taken these courses, please see the Prof. Karwe as soon as possible, before signing up for this course.

Topics Covered
Introduction Food Engineering: an Overview
Engineering Units
Material Balance
Thermodynamics
Psychrometry
Energy Balance
Rheology Foods
Flow of Fluids
Steady State Heat Transfer
Unsteady State Heat Transfer
Reaction Kinetics
Thermal Processing of Foods
Freezing
Evaporation
Steady State and Unsteady State Mass Transfer
Food Dehydration/Drying
Introduction to Non-thermal Processes for Food Preservation

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

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

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

Grading Criteria (subject to revision):
Homework: 12%; Quizzes 18%; Test I: 20%; Test II: 23%; Test III: 27%.