

Applied and Industrial Microbiology
16:682:524 (3 credits)

Offered: Lecture course which is offered each Fall semester.

Prerequisites and Registration Restrictions:

Pre-requisites: 16:682:501 Microbial Life or permission of Instructor.

Format: Two 1 hour 20 min lectures plus a 3 hour laboratory class per week.

Description: Principles of applied and industrial microbiology. The course provides a detailed overview on the utilization and application of microbes in different products and industrial processes.

Topics covered: Historical perspective on utilizing and “domesticating” microbes; Physiological and ecological diversity of useful microbes; Identification of microorganisms; Microbial growth and nutrition, growth kinetics – Bioreactors; Microbial death and control; Molecular techniques and genetic engineering; Food spoilage, Microbiology of fermented foods, including lactic acid fermentations and fermented milk products, yeasts alcoholic fermentations (beer, wine); Large-scale industrial fermentations; Antibiotics; Microbial enzymes; Sanitation, water and wastewater treatment; Environmental biotechnology.

Course Book:

Suggested reading: Industrial Microbiology. An Introduction (M.J. Waites, N.L. Morgan, J.S. Rockney & G. Highton) Blackwell Science Publishers, 2001; ISBN 0-632-05307-0.

Other readings assigned in class.

Learning Goals: Students are expected to gain a fundamental understanding of how microorganisms are utilized in different industrial applications for the benefit of humankind.

Examinations: Class grade is based on three examinations (75%) and a comprehensive term paper (25%). The examinations have a short and extended answer format with some calculations.

Syllabus: A detailed syllabus will be available at the first class meeting and posted on the course Sakai page.

Additional Information: Contact Dr. Haggblom (Rm. 326, Lipman Hall, phone 732-932-9763 x326, email: haggblom@aesop.rutgers.edu