

## Course Synopsis:

### **Analytical Methods in Microbiology**

**11:680:486 (3 credits)**

**Offered:** This is a laboratory course offered every other Spring semester (even years)

#### **Prerequisites and Registration Restrictions:**

Pre-requisites: 11:680:394 Applied Microbiology or Experimental Biochemistry 11:115:403, or equivalent laboratory experience (By permission of the Instructor). The course is intended for undergraduate students in microbiology, biochemistry or biotechnology, and graduate students in the biosciences.

**Format:** 1 lecture plus a 3 laboratory period per week.

**Learning Goals:** Students are expected to gain a fundamental and practical understanding in the use of analytical instrumentation in microbiological research and applications.

After completion of this course, students should be able to:

1. Demonstrate an understanding of the principles of instrumental analysis.
2. Show the ability to efficiently and independently use and interpret data from GC, GC-MS and HPLC applications.
3. Devise experiments according to the scientific method and collect, interpret, and present scientific data in microbiology and related fields

**Course Description:** The course combines lectures and laboratory experiments with hands-on training in the use of analytical instrumentation and experimental design in microbiological research and applications. Analytical methods that are introduced include gas chromatography, GC-mass spectrometry, liquid chromatography (HPLC), ion chromatography, and select molecular methods. The course serves as an introduction to chromatographic analysis, basic principles of mass spectrometry, and reviews different choices of methods and instruments. This includes familiarization with different analytical software and methods of data analysis and interpretation. Laboratory experiments include analytical applications in 1) biotransformations and fermentations, 2) biodegradation of environmental pollutants and 3) identification of bacteria and fungi.

**Examinations and Assignments:** Class grade is based on laboratory performance and participation, written reports, presentations and final examination.

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

**Course Materials:** Laboratory and instrument manuals and other readings assigned in class.

**Additional Information:** Contact Dr. Haggblom (Rm. 121, Lipman Hall, phone 848-932-5646, email: haggblom@sebs.rutgers.edu)