BIOL3303 Experimental Microbiology

Fall 2020

Microbes - including bacteria, fungi, and viruses - are all around us, on us, and within us. They carry out a wide range of metabolic processes, the majority of which are beneficial to both us and the world around us. They carry out essential nutrient cycling in the environment, help us digest our food, provide us with essential nutrients, and can be used to provide us with important products such as antibiotics and numerous food and industrial products.

Microbes can also be harmful, particularly as pathogens of humans, animals, and plants. While many pathogens have been kept under control with antibiotics, the over-use of these compounds has led to the evolution of resistant strains. As a result, a major area of microbial study focuses on how drug resistance arises and spreads in bacteria, as well as on the search for new antibiotics.

In this course, we will experimentally explore the diversity, biochemistry and physiology of bacteria, and learn the techniques used to identify different species and study their growth. We will also look at how resistance to antibiotics evolves, and we will try to isolate some potential new antibiotic producers amongst soil microbes.

As with all courses at Carleton this fall, Experimental Microbiology will be delivered through on-line videos posted on CuLearn. Video-taped, asynchronous lectures will provide background information on various aspects of the growth, maintenance and study of microbes. In the absence of face-to-face labs, short videos will be used to demonstrate laboratory techniques used in the culture and study of microorganisms and examples of both good and bad outcomes will be provided to enhance understanding. We will then combine these techniques to carryout virtual experiments to allow you to identify bacteria, study their growth, measure antibiotic resistance, and isolate novel antibiotic producers. For each experiment, you will be provided with raw data of typical results from actual experiments for you to analyze just as you would in the lab.

This course is ideal for students interested in how microbes impact humans and the broader environment, and for anyone interested in laboratory investigations of microbes.