



Course Name and Number: Biology lab 80-057-01 (Fall), 80-058-01 (Spring)

Type of course: Laboratory

Year of Studies: 2020 - 2021 **Semester:** Fall / Spring **Hours/credits:** 1

Course website: Moodle. All relevant materials will be posted on the class website.

The courses objectives: (Overall Objectives/ Specific Objectives)

- Basic understanding of lab procedure, safety and behavior.
- Experimental design and understanding how to run experiments.
- How to use basic laboratory apparatuses.
- Perform experiments in parallel to course material to further understand and apply the theoretical knowledge that is taught in the lecture.

Course Description:

This is an introductory course to biology laboratory techniques, including an introduction to the world of research. In addition to the basic lab skills and protocols, this course will heavily focus on research methods and technologies, specifically how to plan an experiment and communicate results.

The Process of the Course: (Teaching Methods, use of technology, Guest Speakers)

- Zoom meetings conducted by the lab instructor, with student participation
- PowerPoint presentations for the students to review on their own
- Reading in the lab manual (will be uploaded to the class website)
- Online discussion, quizzes, assignments and presentations
- Hands on laboratory practice (circumstance dependent).

Lesson Plan

The order and topics taught are subject to changes, according to the recommendations of the Ministry of Health and guidelines of Bar-Ilan University. Students are responsible to keep up-to-date with announcements and posts on the Moodle page.

The course is broken down into three modules, with some overlap between the sections.

A: Communication of science and research

- In this unique module, students will develop skills, both orally, written and using various programs in order to communicate scientific findings and results.

B: From genes to phenotype: the central dogma of molecular biology

- In this module, we will work through the central dogma of molecular biology, using various demonstrations/ experiment/ assignments to grasp this concept
- Lab techniques included in this section: DNA extraction from living organisms, recombinant proteins, PCR, gel electrophoresis, DNA extraction from a gel, protein quantification, dissection

C: General Lab techniques for biological research

- In this module, we will learn how to physically work in a lab, including lab safety and proper lab etiquette
- Lab techniques included in this section: unit conversion, pipetting, measurement and weighing, microscopy
- Using the lab skills, topics covered will include: cell structure and function, testing and identification of unknown organic compounds, diffusion, osmosis and biological membranes, and enzymology

Prerequisites

Biology course, basic

Requirements/ Assignment/Tasks

- Attendance of Zoom meetings
- Completion of assignments, quizzes, discussions and presentations throughout the semester
- Final assignment

Grade Components (Number grade or pass/fail)

- 50% in class participation, online discussion, assignments, presentations
- 50% Final assignment