

Course: Bridging Classical Microbiology to the Modern World

Course ID number: xxxxxx

Hours: 2 hours lectures and three laboratories

Schedule: Second semester, 2019, on XXX, hour: XXX,

Room: XXX

Department: Mechanical Engineering

Lecturer: Dr. Noga Qvit-Raz

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Student's hour: Thursdays at 16:00, or upon schedule

Abstract

As microorganisms are a large, and diverse group of microscopic- single celled organisms, they have dramatic influence on environmental and health-related aspects. In this course we will learn topics under the subject "Microbiology", such as learn about selected members of microorganisms, looking at phylogenetic and evolutionary data, and learn how they are being named. We will learn about the principles of the genetic code, and molecular –biology tools, as microorganisms are model organisms for research and advancing molecular biology technologies.

Furthermore, we will learn about the tight relationships between microorganisms and balanced environment and health. We will learn about pathogenic bacteria and viruses, covered by clinical biology aspects. In addition, we will learn the principles, as well as the main techniques of industrial microbiology.

Today, the microbiome is a hot topic, covering the complex relationships within the human body. We will learn about extreme microbial communities, and their special characterizations.

The course will include three hands on laboratories, in which we will learn practical work-flow and techniques for diagnostic, identification, growth, and research in microbiology.

Finally, we will learn using Problem-Base-Learning (PBL) methods how to combine principles, data, and techniques to address modern microbiology –related scientific questions.

Grade Requirements:

40% Work evaluation in labs and lectures

60%- Exam

Finishing course requirements: General grade over 55, Participation in the labs is mandatory, and 80% participation in lectures.

Website: <http://moodle.braude.ac.il>

After participating in the course the student should be able to:

	Learning Objective
1	Understand basic principles in chemistry and biochemistry, related to microbiology. Understand general concepts in bio-geo-chemical cycles, genetic code and molecular biology related to microbiology
2	Understand and acquire vast knowledge about environmental microbial communities. Understand and acquire vast knowledge about clinical microbiology, and health related microbiology
3	Obtain knowledge about the technical, regulation and economic development microbiological aspects
4	Have a “hands-on” approach, and obtain technical, writing, and design experience
5	Base on Problem-Base-learning (PBL), combined with solid data and scientific information to learn and advance microbial technologies

Literature:

- Biology of Microorganisms. Brock. Madigan, Martinko, Parker. Prentice Hall; 13th edition, 2012
- Life: The Science of Biology. Sadava, Hillis, Heller, Berenbaum. Publisher: W. H. Freeman, 10th edition, 2012.

The syllabus links to library: <http://braude.ac.il/?catid>