

HSSP SUMMER 2009

2402: BIOLOGICAL ENGINEERING FOR BEGINNERS

Sundays, 10am-noon, Room 17

Website: https://esp.mit.edu/learn/HSSP/2009_Summer/Classes/E2402/index.html

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Overview

Welcome to 2402. This is an introductory course to biological engineering for middle and high school students. Normally, topics in biological engineering (BE) are not offered until college or graduate school because of their dependence on calculus, physics, chemistry and biology. This course is meant to provide an understanding of the basic concepts related to BE, but does not assume knowledge of any of the prerequisite topics. Students should expect to receive an introduction to the most important fundamentals in BE, with an entirely new topic covered each class.

Biological Engineering, not Biomedical Engineering

BE is commonly confused with Biomedical Engineering (BME). However, in the field we make a clear distinction between the two. BE applies engineering principles in design, synthesis, and analysis to biology at the molecular and cellular level. In contrast, Biomedical Engineering is the application of traditional engineering disciplines to medical problems without any necessary grounding in molecular life sciences. This course will focus on BE, but if you have any questions about BME along the way, feel free to ask and we can learn more about it together.

Course Schedule

<u>Lecture</u>	<u>Date</u>	<u>Topic</u>
1 (AG)	7/12	What is Biological Engineering?
2 (AG + LC)	7/19	Biochemistry I: DNA
3 (AG + LC)	7/26	Biochemistry II: Proteins
4 (AG)	8/2	Genetics
5 (LC)	8/9	Thermodynamics
6 (LC + AG)	8/16	Programming with Python
7 (LC)	8/23	Biomechanics + Fluid Mechanics
8 (LC)	8/30	Electromagnetic Forces

