Biology 322

Course Syllabus Form
American University of Beirut
Faculty of Arts and Sciences
Biology Department

Course Number and Title: BIOL 322 Advanced Biochemistry

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Office: Biology 313, ext 3887
Office hours: WHF 4:00-5:00 pm

Catalog Description:
BIOL 330: Advanced Biochemistry 3.0; 3 cr.
This course presents the relationship of biomolecular structure to function, enzyme catalysis, regulation of gene expression, and selected topics of current biochemical research.

Original course description:
This course presents the relationship of biomolecular structure to function, enzyme catalysis, the regulation of protein activity, multi-component systems, and selected examples of current biochemical research.

Relevant Program Objectives:
Develop theoretical and practical expertise in a topical research area of Cell and Molecular Biology.
Develop the skills to identify and pursue basic research questions by initiating and successfully conducting a sustainable program of original research.
Develop an ability to generate and analyze data critically, and apply that ability in their own research.
Develop skills necessary to communicate findings in both oral and written formats through presentations at scientific meetings and publications in peer-reviewed journals.

Texts and resources:
I recommend every molecular and cell biologist own a copy of an undergraduate biochemistry textbook such as Stryer, Horton et al., Voet, Leninger, et cetera, and a copy of Lewin’s Genes (X is latest edition).

Published articles and other materials will be distributed throughout the semester either by Moodle, email, or in class. Other course material and sample exams will be placed on Moodle.

General course overview: Biochemistry is the application of the tools and perspectives of chemistry to biological systems, most centrally, structure-function relationships, enzymology, regulation, and metabolism. Current topics and methods will be explored by detailed readings of recent literature, primarily from PNAS, Biochemistry, and if possible, Nature, Science, and Cell. Technical aspects of laboratory procedures will not be unduly emphasized. Each week will consist of
discussions or presentations of recent publications. Explanatory background will be provided, as necessary, as formal and informal lectures.

**Course objectives:** The goal is to provide the student with the most important professional skill needed by scientists: to be able to read, analyze, and discuss scientific articles critically and cogently, in this course, within the domain of biochemistry. On this foundation is built the practice of intelligent inquiry, experimental design, research strategy, and scientific writing. By the end of the course, students should be able to understand and critically evaluate the scientific relevance and experimental approach of any research publication concerning biochemistry. Students will know where to find background and ancillary information. Students will be able to discuss current research in biochemistry, and to be able to design approaches to biochemical aspects of their own research. Lectures will provide background, but the primary means to achieving competency with current research will be critically reading current articles, and having to formulate and answer questions on those articles. Assessment will be in the form of exams in which the student is given an article at least one week before, and given a clean copy with questions. Participation will be assessed by homework (formulating quality questions on the assigned articles), attendance, and constructive participation during class discussions.

**Grading:** Evaluations will be based on performance on 2 mid-term exams, a final exam, and participation in discussion. Each of the exams will be worth 25% of the course grade, while the remaining 25% will be participation, which includes homework, attendance, and fulfilling productive roles in discussions.

**Schedule:** We will not follow a pre-determined schedule, recent articles will be chosen as the course progresses based on class needs and interests. The first exam is tentatively scheduled in class mid-March, the second exam mid-April, and the final will be scheduled by the registrar.