

Guidelines for Applying for Transfer Credit of Biology Courses

FOR ALL REQUESTS:

To determine if the course is indeed equivalent, we need a detailed course description such as a syllabus or an outline of course topics. In the case of Biochemistry it is sometimes helpful to list the prerequisites for the course as well. It can also be helpful to provide the textbook used for the course.

Guidelines for 03-121 MODERN BIOLOGY

One of the most difficult aspects of finding a comparable course to substitute for Modern Biology is its focus on the micro side of biology (i.e. molecular biology, cell biology, biochemistry).

The CMU course description states: This is an introductory course that provides the basis for further studies in biochemistry, cell biology, genetics and molecular biology. This course emphasizes the chemical principles underlying biological processes and cell structures as well as the analysis of genetics and heredity from a molecular perspective.

General characteristics that should be addressed regarding a possible transfer credit course:

1. Is it a course for science majors?
2. Is it part of a two course sequence in intro bio?
3. Are the topics presented in the course EXACTLY the same topics that are covered mod bio course? For example, some intro bio courses cover botany and ecology and evolution rather than the emphasis we have on cell and molecular biology

Guidelines for 03-231/232 BIOCHEMISTRY

Biochemistry at Carnegie Mellon leans more heavily on the CHEMISTRY side, rather than the BIO. Organic Chemistry is a co-requisite, so the substitution should also require the course.

CENTRAL CONCEPTS: The following is a brief list of the central concepts associated with this course.

1. Constituent parts -- Higher order structures (carbohydrates, proteins, lipids, nucleic acids)
2. Protein-ligand interactions:
 - o Direct function (e.g. oxygen binding, immunoglobulins)
 - o Regulation (Gene regulation)
 - o Enzymology (Regulation of metabolism)
3. Regulation:
 - o Energy production (glycolysis, TCA cycle, Oxidative Phosphorylation)
 - o Energy consumption (biosynthetic pathways)

- Template directed synthesis (DNA, RNA, protein)

4. Recombinant DNA methods

The course description of the course you are looking to substitute should MATCH the course description for the course here at CMU:

This course provides an introduction to the application of biochemistry to biotechnology. The functional properties of amino acids, nucleotides, lipids, and sugars are presented. This is followed by a discussion of the structural and thermodynamic aspects of the organization of these molecules into higher-order structures, such as proteins, nucleic acids, and membranes. The kinetics and thermodynamics of protein-ligand interactions are discussed for non-cooperative, cooperative, and allosteric binding events. The use of mechanistic and kinetic information in enzyme characterization and drug discovery are discussed. Topics pertinent to biotechnology include: antibody production and use, energy production in biochemical systems, expression of recombinant proteins, and methods of protein purification and characterization.