

Biology Department Advanced Standing Exam Topics

All of the 7.01x classes focus on molecular and cellular biology. There are common elements in all the classes and questions covering these common elements will form the majority of the Advanced Standing Exam. The common topic areas are:

Biochemistry:

- Macromolecules
 - Nucleic acid
 - Protein
 - Lipid
 - Carbohydrates
- Bonds and forces
- Cellular energy generation and usage
- Enzymes and kinetics

Cell Biology:

- Basic cell structure
- Central Dogma
- Protein sorting and processing
- Gene expression
- Cell cycle
- Viruses

Genetics:

- Basic Mendelian genetics
- Basic Bacterial genetics
- Mapping and linkage
- Genomics

Molecular Biology:

- DNA structure/function
- Cloning of a gene
 - Cutting and pasting DNA
 - Vectors and plasmids
 - Transformation/ Selection/Screening of positive clones
- DNA sequencing
- Microarrays

In addition, there are a few special topics that have been on past exams:

- Immunology
- Neurobiology
- Cancer biology
- Stem cells and cloning
- Molecular evolution