

## BI/BIO/BIOL 221Z Principles of Biology: Cells

For more detailed information, see CCN Reports & Memos on the [Educator Resources—Common Course Numbering](#) webpage.

### CCN Course/Course Information

#### Biology

**Course Number and Subject Codes:** BI, BIO, or BIOL 221Z

**Course Title:** Principles of Biology: Cells

**Course Credits:** 5 (The course must include both lecture and lab components. Both of these components are embedded under the same course number and appearing as a single grade item on transcripts.)

**Course Description:** Explores fundamental biological concepts and theories about the cellular and molecular basis of life including cell structure and function, metabolism, genetic basis of inheritance and how information flows from DNA to proteins, with a focus on the iterative process of science. Intended for science majors.

#### Course Learning Outcome Introductory Statement:

This work is based on the national 2011 American Association of Advancement of Science (AAAS) report "Vision and Change in Undergraduate Biology Education" that recommended 5 overarching Core Concepts and 6 Core Competencies for biology majors. For details about implementation refer to:

For Core Concepts see [BioCore Guide](#) (see Supplement 2 from Brownell et al., 2017)

For Core Competencies see [BioSkills Guide](#) (see Supplement from Clemmons et al., 2020)

#### Course Learning Outcomes:

1. Apply the iterative process of science to generate and answer biological questions by analyzing data and drawing conclusions that are based on empirical evidence and current scientific understanding.
2. Use evidence to develop informed opinions on contemporary biological issues and explain the implications of those issues on society.
3. Describe the structure and related functions of major classes of biomolecules.
4. Differentiate cell components and their functions, emphasizing them as a system of interacting parts.
5. Compare and contrast anabolic (photosynthesis) and catabolic (respiration and fermentation) pathways emphasizing the transformation of energy and matter.
6. Articulate how cells store, use, and transmit genetic information.
7. Explain how mutation and genetic recombination contribute to phenotypic variation and evolution.