Pathways Introductory Biology Majors Committee

Introductory Biology, Molecular and Cellular Biology

Topics:

I. The Scientific Method As Applied to Biological Investigations

A. Presentation of experimental design concepts.

B. Development of the scientific process which leads to testing of hypotheses.

C. Experimental design and incorporation of controls.

II. Chemical Context of Life

A. The chemical features of atoms and molecules.

B. The structure and function of the major classes of biological molecules (large: lipids, phospholipids and steroids, and macromolecules: nucleic acids, proteins and polysaccharides).

C. Interplay of biomolecules within biosystems.

III. The Biology of Archaea, Bacteria and Eukaryotes

A. The history, structure and function of cells and cellular components.

B. The signaling and interactions between intracellular organelles.

C. Signaling processing within cells.

D. Signaling processes between cells.

E. Replication of Prokaryotic and Eukaryotic cells: fission, mitosis and meiosis.

IV. Genetic Systems and Their Expression

A. Classical and modern concepts of heritability.

B. Process of replication.

C. Processes of transcription and translation.

D. Regulation of phenotypic and functional expression of genetic information.

E. Molecular basis of evolution.

Introductory Biology, Organismic Biology

Topics:

I. The Scientific Method As Applied to Biological Investigations

A. Presentation of experimental design concepts.

B. Development of the scientific process which leads to testing of hypotheses.

C. Experimental design and incorporation of controls.

II. Transmission Genetics

A. Mitosis/Meiosis.

B. Mendelian genetics.

C. Non-Mendelian genetics.

D. Pedigrees and genetic diseases.

III. Evolutionary Processes

A. The history of evolutionary thought.

B. Microevolution and macroevolution.

C. Speciation.

IV. Survey of Biodiversity

A. The history of life on earth.

B. The diversity of life across the principal groups of organisms.

C. Comparative analysis of form and function.

V. Ecology

A. Interactions between organisms and their environment.

B. Population and community ecology.

C. Ecosystem structure and function.

D. Human ecology.