

MISSION STATEMENT -- BIOLOGY MAJOR

The Monmouth College biology major is designed to impart to students a broad understanding of the processes, concepts, and structures that characterize life at three basic levels: molecular/cellular, system/organism, and community/ecosystem. The program also encourages scientific investigation and experimentation through laboratory and field experiences and independent and collaborative student research. Finally, the program helps students prepare for further studies in graduate or professional school, or for careers in health care, public and private research, teaching, and related fields.

Structure of the curriculum

1. A required "core" of six biology courses with labs representing three levels of life processes:
 - a. two introductory courses with labs (botany and zoology)
 - b. cell biology, genetics, physiology, and ecology
2. Three required courses in chemistry
3. Two required courses in math and/or physics
4. Electives with advanced content in each of the three levels
5. Science seminar
6. Senior research

Biology major and the Mission of the College

The biology major complements the mission and purposes of the College in a variety of ways. The major prepares students for professions utilizing biological knowledge by providing instruction in basic biological concepts, field and laboratory skills, and offering electives for greater specialization. Intellectual inquiry and critical analysis are progressively promoted in the program. Students begin by interpreting experimental results and their validity. In more advanced courses, greater emphasis is placed on the design of experiments and data analysis. Our capstone course (senior research) requires a background literature search and hypothesis formation; designing and executing the experiment; and finally, analyzing data and interpreting results.

The program promotes leadership through group projects including discussions, lab experiments and reports. Lab assistants have opportunities to direct and design lab activities. The department supports a chapter of Beta Beta Beta, the national honorary biological society, and the Monmouth College Environmental Club. Both extracurricular organizations offer leadership and service opportunities.

The major attempts to foster connections among disparate disciplines both within and beyond traditional math and science. Math and physics skills are integrated throughout the biology curriculum and the overlap between biology and chemistry is unavoidable at all levels. Sound communication abilities are stressed through lab reports and oral presentations. We attempt to push our

students beyond traditional disciplinary limits. Biological knowledge can help students make informed choices in a free society. Facts can also inform values, but we appreciate the limits of their utility. Philosophical, religious, and political viewpoints can intermingle with definitions of life and the value of life. Does a mechanistic theory of evolution rob your life of significant meaning? What can biology tell us about human nature, if anything? When does “life” begin and end? Biological science can offer technological solutions to some problems, but do we have the wisdom, fortitude, or discipline to implement them? The use of biological knowledge has positive and negative potential. How should we judge the human genome project? These questions and others are integrated at various levels in the biology program.

Biology Assessment Data Collection Plan
Revised 9/16/04

Program Objectives/Outcomes

1. Understand fundamental concepts and learn basic facts and terminology in various fields of biology and related sciences.

Assessed using embedded assessment measures in:

BIOL111, Zoology. Exam/quiz questions on **scientific method.**

Exam/quiz questions on **mitosis.**

BIOL112, Botany. Exam questions on **photosynthesis.**

Exam questions on **alternation of generations.**

BIOL200, Cell Biology. Exam/quiz questions on **cellular respiration.**

BIOL204, Human A & P. Exam questions on **homeostasis.**

2. Become proficient in use of standard laboratory equipment.

Assessed using embedded assessment measures in:

BIOL111, Zoology. Quiz questions on **microscope use.**

BIOL200, Cell Biology. Quiz questions on **gel electrophoresis.**

3. Retrieve, synthesize, and critically evaluate scientific literature.

Assessed based on performance on assignments in:

BIOL222, Intro to Research I.

BIOL322, Intro to Research II.

BIOL204, Human A & P, term paper

4. Communicate, orally and in writing, results and interpretation of scientific research.

Assessed based on performance on assignments in:

BIOL222, Intro to Research I.

BIOL322, Intro to Research II.

5. Design and implement experiments that test predictive hypotheses. Analyze data, report results, and interpret their significance.

Assessed based on performance on assignments in:

BIOL202, Genetics, Chi Square assignment

BIOL307, Ecology, lab report grades

BIOL450, Research II, poster, presentation, paper

6. Understand the broader context of biological knowledge in relation to other disciplines.

Assessed using embedded assessment measures in:

BIOL307, Ecology. Exam questions.