

Lock Haven University
University Curriculum Committee

PROPOSAL COVER SHEET

Course #: Biol 107 Title: PRINCIPLES OF BIOLOGY II 30 sh

** See the back for instructions on listing the course number and how this document should be routed through the curricular process.

New Course Drop Course New Degree Drop Degree Revision Other


Briefly state the reason for the revision TO MEET P.D.E. CONTENT STANDARD


Applicable overlay(s) IL MC EE _____ (units) WE

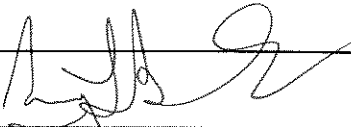
Prerequisites: Not Applicable Change (Addition/Removal)

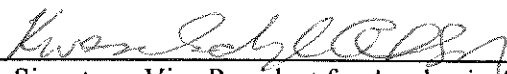
Please Specify any changes _____

Please Specify the effective date of these changes Spring 2006

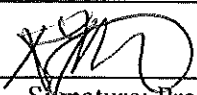
	8-30-05	<input checked="" type="radio"/> Approve	<input type="radio"/> Disapprove
Signature: Department Chairperson	Date	Recommendation	

	9/19/05	<input checked="" type="radio"/> Approve	<input type="radio"/> Disapprove
Signature: Chairperson, College Curriculum Subcommittee or Graduate Curriculum Subcommittee	Date	Recommendation	

	11/11/05	<input checked="" type="radio"/> Approve	<input type="radio"/> Disapprove
Signature: Chairperson, University Curriculum Committee	Date	Recommendation	

	11/14/05	<input checked="" type="radio"/> Approve	<input type="radio"/> Disapprove
Signature: Vice President for Academic Affairs	Date	Recommendation	

PROVOST - Does this proposal need to go to the: Board of Governors Council of Trustees

	11/17/05	<input checked="" type="radio"/> Approve	<input type="radio"/> Disapprove
Signature: President	Date	Recommendation	

11/17/05
SW

To: Arts and Sciences and University Curriculum Committees

From: Dr. Shonah Hunter

Date: August 30, 2005

Re: Minor changes to content and syllabus in Principles of Biology I and II
Biology 106 and Biology 107

Rationale for Proposed Changes

Revisions to PoB II involved returning the topic of Animal Behavior to the course so that the Pennsylvania Department of Education (PDE) content standard of I.D. Structure, function and development of organisms including: Instincts, learned behaviors, and communications are met. Animal Behavior was omitted about 3 years ago when the interest in Biotechnology and DNA Forensics blossomed and I could not cover all topics in 2 lecture session per week. With the inclusion of Animal Behavior, the time distribution of other content had to be changed to accommodate it.

Changes in PoB I is because Meiosis was moved from PoB II to the end of PoB due to time in PoB II due to Animal Behavior.

Lock Haven University of Pennsylvania
Lock Haven, Pennsylvania

Department of Biological Sciences
Principles of Biology II (BIOL107)

I. Introductory Information:

- A. Department: Biological Sciences
B. Departmental Catalogue Number: BIOL107
C. Course Title: Principles of Biology II
D. Semester Hours of Credit: 3
E. Clock Hours Per Week: 5 hours (Two lecture hours and one, 3-hour laboratory)
F. Overlays: WE, IL
G. Restriction Upon Student Registration: Prerequisite of Principles of Biology I (BIOL106), or permission of instructor. Primarily for Science majors.
May not be used in combination with BIOL101 to satisfy general education natural science requirements.

II. Description of the Course:

A. Catalog Description:

A continuation of Principles of Biology I with emphasis on cell reproduction and development, genetics, molecular biology, biological evolution and the diversity of life, and fundamentals of ecology. Laboratory exercises are designed to reinforce and supplement principles covered in lecture and to provide students with experiences in making observations, hypothesis testing, and data collection, analysis and interpretation. This course qualifies as a general education requirement in the natural sciences.

B. Comprehensive Description:

The content of this course relates to standards of the Interstate New Teacher Assessment and Support Consortium (INTASC) Standards, the National Council for Accreditation of Teacher Education (NCATE), National Science Teachers Association (NSTA), and the Pennsylvania Department of Education (PDE) Standards for Secondary Education-Biology.

This course addresses INTASC Unit Standard One: Subject Matter and NCATE/NSTA standards: 1 Content, 2. Nature of Science, 3 Inquiry, 4. Context of Science, and 7. Social Context.

This course also addresses the following PDE Biology standards at the introductory level:

- I.C. Classical and molecular genetics and the evolution and diversity of life.
I.D. Structure, function and development of organisms.
I.E. Ecological relationships among populations, communities and ecosystems.
I.F. Technological and commercial issues and applications of biological systems.
I.G. Implications of scientific and technological developments on ethical questions relating to biology.

III. Exposition:

A. Objectives

Upon completion of this course, students will be able to do the following:

1. Demonstrate the correct use of the scientific method.
2. Describe basic biological principles and explain how they relate to all living things.
3. Describe basic inheritance patterns and the concepts of molecular biology.
4. Describe similar developmental patterns among vertebrate groups and explain their significance.
5. Describe principles of evolution and explain how they relate to the diversity of organisms.
6. Describe basic ecological concepts and explain how they relate to biological systems.
7. Describe basic principles of behavior and how they relate to interactions of organisms with their environments.
8. Integrate recent discoveries in applied or theoretical biology with classical information.
9. Describe implications of scientific or technological developments on ethical questions in biology.

B. Activities and Requirements

Students are expected to attend two, 1-hour lectures and one, 3-hour laboratory session per week. Grades will be based on some combination of assignments, such as quizzes and exams given throughout the semester, and lecture and laboratory assignments.

In the lecture, students will participate in lectures and discussions of basic biological principles and their interactions and applications. Small group work sessions on a particular topic will facilitate discussion and understanding of the concepts.

In the laboratory, students will work with equipment and experiments designed to test and verify ideas presented in lecture. Students will also design experiments, conduct them and present their results either orally or as a written laboratory report. The purpose of the lab component is for the students to acquire basic laboratory skills, to apply concepts discussed in lecture, and to gain experience using the scientific method to test hypotheses.

Activities related to Objectives in III.A.

1. In lecture, information will often be presented in a way that requires students to make predictions, describe experiments and be able to evaluate results in order to understand the significance of the information being presented. In laboratory sessions, students will conduct observations and experiments that verify concepts or test hypotheses. During several weeks, students will design an experiment, write a protocol, and conduct and revise the experiment. Then they will write the report in the standard format for scientific report writing.
2. Students will participate in lecture discussions relating basic biological principles to other aspects of the course. In laboratory sessions, students will conduct experiments that require them to integrate their understanding of basic biological principles with other aspects of the course.
3. Students will participate in lecture discussions of classical genetics and molecular biology and their relationship to each other. Students will also conduct laboratory observations and experiments on these topics.
4. Students will conduct laboratory observations and experiments that will allow them to investigate development patterns among vertebrates.
5. Students will participate in discussions of the principles of evolution and will relate them to the diversity of organisms. Students will also conduct laboratory observation and exercises testing their understanding of evolution and diversity of organisms.
6. Students will participate in discussions and investigations of basic principles of animal behavior and how they relate to adaptations of organisms to their environments.

7. Students will participate in discussions of basic ecological principles and how they relate to interactions of organisms. Students will also conduct laboratory observation and exercises testing their understanding of ecology and the interactions of organisms.
8. Students will participate in discussions that relate recent discoveries in biology with classical information.
9. Students will participate in discussions that explore the ethical implications of new scientific and technological developments.

C. Major Units and Time Allotted:

	Hours
1. Semester Introduction/Overview.	1
2. Mendelian Patterns of Inheritance	3
3. Exceptions to Mendelian Genetic	3
4. The structure of DNA, DNA replication.	2
5. Gene Activity: Transcription	2
6. Regulation of Gene Activity: Translation	2
7. Biotechnology	2
8. Evolution	4
9. Animal Behavior	3
10. Ecology	4
11. Testing	4

Students also attend one, 3-hour laboratory session per week.

D. Materials and Bibliography

1. Suggested Textbook:
Mader, Sylvia S., 2003. Biology, 8th edition. McGraw-Hill Companies, Inc.
2. Other Materials:
Videos, online interactive laboratory assignments, web sites.
3. Bibliographic Support:

Selected Bibliography

- Anderson, W. G. 1995. Gene Therapy. *Scientific American* 273(3):124.
- Begon, M., D.J. Thompson and M. Mortimer, Editors. 1996. *Population Ecology: A Unified Study of Animals and Plants*. 3rd Ed. Blackwell Science, Inc.
- Brewer, R. 1997. *The Science of Ecology*. 2nd Ed. Saunders College Publishing.
- Carroll, S.B., J.K. Grenier and S.D. Weatherbee. 2001. *From DNA to Diversity: Molecular Genetics and the Evolution of Animal Design*. Blackwell Science, Inc.
- Chapman, A.R. and M.S. Frankel, Eds., 2003. *Designing our Descendants: The Promises and Perils of Genetic Modification*. Johns Hopkins University Press.
- Davies, K. 2002. *Cracking the Genome: Inside the Race to Unlock Human DNA*. Johns Hopkins University Press.

- Edelson, E. 2001. Gregor Mendel and the Roots of Genetics. Oxford University Press.
- Getis, J. 1998. You can Make a Difference: Be Environmentally Responsible. WCB/McGraw-Hill Publishers.
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- Halford, N.G. 2003. Genetically Modified Crops. Imperial College Press.
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- Mauseth, J.D. 2003. Botany: An Introduction to Plant Biology. 3rd Ed. Jones and Bartlett Publishers, Inc.
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- Ruse, M. and D. Castle. 2002. Genetically Modified Foods: Debating Biotechnology. Prometheus Books.
- Ruse, M. and C.A. Pynes. 2003. The Stem Cell Controversy: Debating the Issue. Prometheus Books.
- Ruse, M. and A. Sheppard. 2000. Cloning: Responsible Science or Technomaddness? Prometheus Books.
- Scientific American Special Issue. 1994. Evolution. Scientific American 271(4).
- Smith, R.L. 1996. Ecology and Field Biology. 5th Ed. Harper & Row.
- Thompson, B. Ed., 2003. Evolution. Greenhaven Press.
- Watson, J.D. 1981. The Double Helix: A Personal Account of the Discovery of the Structure of DNA. W.W. Norton & Company, Inc.
- Wolfe, S. 1995. Introduction to Cell and Molecular Biology. Wadsworth.

IV. Standards:

Grades will be awarded in a manner consistent with University policy, and will be based upon student demonstration of a mastery of the course material through such means as exams and quizzes, homework, lab work and laboratory reports.

Assessment related to the objectives:

1. Students will take quizzes and exams that include questions asking students to use the scientific method. Lab assignments and a lab report will be used to evaluate students' use of the scientific method.
2. Exam and quiz questions will test students' understanding of basic biological principles and how well they can relate those principles to living things.
3. Exam and quiz questions will test students' understanding of basic inheritance patterns and molecular biology and how they relate to each other. Laboratory assignments will test students' ability to use this knowledge, to interpret data and to solve problems related to inheritance. Laboratory sessions and assignments will also be used to test students' understanding of molecular biology.
4. Laboratory assignments that include observation and experimentation will evaluate students' ability to describe basic development patterns and make comparisons among vertebrate groups.
5. Exam and quiz questions and laboratory assignments will test students' understanding of basic principles of evolution and how they relate to diversity of organisms.
6. Exam and quiz questions will test students' understanding of basic principles of animal behavior and how it relates to adaptations of organisms to their environments. Laboratory experiments and assignments will be used to evaluate students' understanding of these principles.
7. Exam and quiz questions will test students' understanding of basic ecological principles and the interactions of organisms. Laboratory assignments and case studies will be used to evaluate students' understanding of these principles.
8. Exam questions will test students' ability to relate recent discoveries with classical information so as to recognize the historical context of biological principles, as well as the revisionist nature of science based on new evidence.
9. Exam questions, assignments, and case studies will be used to evaluate students' ability to evaluate the ethical implications of new scientific and technological developments.

V. Rationale and Impact:

A. This course is required of BS Biology majors, BS Biology/Chemistry majors, BS Secondary Education science majors, BA Natural Science – Biology majors, Health Science majors and Biology minors. This revision has updated the syllabus to more accurately reflect the current information in the discipline. The revision also includes the activities that reflect the Writing Emphasis and Information Literacy overlay criteria.

B. This course provides a sound basis and overview of basic biological principles required of these majors. The course also helps prepare students for other upper level biology courses in that many topics and methods (theoretical and experimental) explored in this course are explored in more detail in other courses.

C. There will be no impact on existing departments or programs since this is a revision of an existing course.

VI. Cost and Staff Analysis:

A. This is not a new course, but rather a revision of the syllabus for an existing course. This course will have no additional requirements for financial resources beyond the normal operating costs, since it is part of the current course offerings in the Department of Biological Sciences.

B. This course is taught every Spring Semester.

VII. Date Approved by University President:

(Signature)

(Date)