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Lock Haven University
University Curriculum Committee

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PROPOSAL COVER SHEET

Course #: BIOL206 Title: Botany 3 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: This course is redistributing the student contact hours between lecture and lab without changing the number of credits students receive in an effort to improve the efficiency and effectiveness of delivering content material.

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

***Only check overlay if it is a NEW overlay

Prerequisites: Not Applicable Change (Addition/Removal)

Please Specify any changes _____

Please Specify the effective date of these changes _____

<i>Ralph S. Harris</i>	1-24-07	Approve	Disapprove
Signature: Department Chairperson	Date	Recommendation	

N/A		Approve	Disapprove
Signature: Dean of College	Date	Recommendation	

New programs and new courses require the approval of the Dean **BEFORE** distribution at the college curriculum subcommittee. Revisions to existing courses including addition of overlays do not require the signature of the Dean and may go directly to the college curriculum subcommittee.

<i>Jynette Ritz</i>	2/16/07	Approve	Disapprove
Signature: Chairperson, College Curriculum Subcommittee or Graduate Curriculum Subcommittee	Date	Recommendation	

<i>[Signature]</i>	4/17/07	Approve	Disapprove
Signature: Chairperson, University Curriculum Committee	Date	Recommendation	

<i>[Signature]</i>	4/27/07	Approve	Disapprove
Signature: Vice President for Academic Affairs	Date	Recommendation	

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

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<i>Kurt Miller</i>	5/2/07	Approve	Disapprove
Signature: President	Date	Recommendation	

✓
5/3/07
SW

Lock Haven University of Pennsylvania
Lock Haven, Pennsylvania

Department of Biological Sciences
Botany
BIOL206

I. Introductory Information:

- A. Department: Biological Sciences
- B. Departmental Catalogue Number: BIOL206
- C. Course Title: Botany
- D. Credit in Terms of Semester Hours: Three
- E. Clock Hours Per Week: 5.5 (3 lecture hours, 2.5 laboratory hours)
- F. Restrictions: Prerequisites are Principles of Biology I & II (BIOL106, BIOL107).

II. Description of Course

A. Catalog Description:

An introduction to the principles of botany. Emphasis is placed on the integration of structure and function that reflect plant diversity and evolution. The primary models for this approach are angiosperms but also include discussions of other plant taxa. Topics covered include the following: plant cellular structure, anatomy and morphology of stems, roots and leaves and flowers, transport processes, photosynthesis, plant growth and development, plant diversity, and economic botany.

Prerequisite: Biol106/107, Principles of Biology

B. Comprehensive Description:

This course is part of the Biology Core taken by all Biology, Biology/Chemistry and Secondary Education – Biology majors. The course is intended to provide students with a basic understanding of the anatomy, morphology, taxonomy, evolution, physiology, and economics of plants.

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 upper course level:

- I.B. Molecular and cellular biology and chemical basis of life.
- 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

III. Exposition:

A. Objectives

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

1. Explain the importance of botany as a past, present and future science.
2. Describe plant cellular structure and basic comparative plant anatomy and morphology.
3. Compare basic transport processes and pathways within plants.
4. Explain the basics of metabolism with an emphasis on photosynthesis.
5. Describe basic developmental processes in plants and the roles of plant hormones in growth and development.
6. Describe distinguishing characteristics and life cycles of the diverse groups within the Plant Kingdom, including bryophytes, ferns, gymnosperms, and angiosperms.
7. Analyze basic concepts of plant evolution.

B. Activities and Requirements

Activities will include lectures and discussions of assigned reading material. Students are expected to attend 3 hours of lecture and 2.5 hours of laboratory per week. Active participation in lecture and lab discussions is expected. Lecture material may parallel concepts covered in the laboratory but new material will also be presented in the laboratory. Lectures and laboratories may be augmented by using multimedia and other interactive teaching/learning tools. Grades will be based on quizzes and exams given throughout the semester, and lecture and laboratory assignments.

The lecture component of this course will comprise both formal presentation as well as discussion. Because the content of both lecture and laboratory requires that students assume a comparative approach to plant structure and function students will be expected to make meaningful comparisons between and among plant taxa.

In the Laboratory, students will work individually and in small groups to investigate concepts discussed in lecture as well as new material. The labs are designed so students can work at their own pace and utilize a guided inquiry approach.

Activities Related to Objectives in III. A

1. Students will participate in class discussions and work in small groups to demonstrate their knowledge that the study of plants is an essential part of the study of biology.
2. Students will attend lectures and laboratories which will include considerations of comparative plant anatomy and morphology.
3. Students will discuss in lectures and perform laboratory exercises that describe the basic pathways that water and nutrients follow as they move throughout the plant body.
4. Students will attend lectures which will include discussions of comparative plant metabolism, especially with respect to photosynthesis.

5. Students will attend lectures participate in discussions and describe basic developmental processes in plants and the roles that plant hormones play in growth and development.
6. Students will attend lectures and participate in laboratories where discussions of the distinguishing characteristics and life cycles of the diverse groups within the Plant Kingdom, including bryophytes, ferns, gymnosperms, and angiosperms are included.
7. Students will attend lectures and laboratories where basic concepts of plant evolution are discussed.

C. Major Units and Time Allotted	Hours
1. Historical origins and development of plant science	3
2. The Plant Cell	5
3. Cell and Tissue Types	4
4. Stems	4
5. Roots	4
6. Leaves	3
7. Transport of Water, Minerals, and Nutrients	6
8. Metabolism.....	6
9. Plant growth and development	6
10. Plant Life Cycles.....	4
<u>TOTAL.....</u>	<u>45</u>

D. Materials and Bibliography

1. Suggested Textbooks

Mauseth, James D. 2003. Botany: An Introduction To Plant Biology, 3rd Edition. Saunders, Philadelphia, PA.

2. Other Materials

Laboratory experiments and procedures will be written by instructor and may be used in the form of a manual.

3. Bibliographic Support

Allen, Michael F. 1991. The Ecology of Mycorrhizae. Cambridge University Press, NY.

Attenborough, David. 1995. The Private Life of Plants: A Natural History of Plant Behavior. Princeton University Press, Princeton,

Bernays, Elizabeth A., Editor. 1994. Insect-Plant Interactions. CRC Press, Fla

Chrispeels, M.T. and D.E. Sadava. 1994. Plants, Genes and Agriculture. Jones and Barlett, Boston.

Dafni, Amots. 1992. Pollination Ecology: A Practical Approach. IRL Press at Oxford University Press, NY.

Davies, Peter J., Editor. 1992. Plant Hormones: Physiology, Biochemistry and Molecular Biology, 2nd Edition. Kluwer Academic, Boston.

Devine, Malcolm. 1993. Physiology of Herbicide Action. PTR Prentice Hall, NJ.

- Fosket, Donald e. 1994. Plant Growth and Development: A Molecular Approach. Academic Press, San Diego.
- Galston, Arthur W. 1994. Life Processes of Plants. W.H. Freeman, NY
- Gifford, Ernest M. and Adrienne S. Foster. 1989. Morphology and Evolution of Vascular Plants, 3rd Edition. W.H. Freeman, NY.
- Heiser, Charles B. 1985. Of Plants and People, 1st Edition. Univ. of Oklahoma Press, Norman.
- Hopkins, William G. 1995. Introduction to Plant Physiology. Wiley, NY.
- Jones, Samuel B. and Arlene E. Luchsinger. 1986. Plant Systematics, 2nd Edition. McGraw-Hill, NY.
- Kendrick, R.E. and G.H.M. Kronenberg, Editors. 1986. Photomorphogenesis in Plants. Dordrecht, Boston.
- King, John. 1991. The Genetic Basis of Plant Physiological Processes. Oxford University Press, NY.
- Lewington, Anna. 1990. Plants for People. Oxford University Press, NY.
- Mauseth, James D. 1988. Plant Anatomy. Benjamin/Cummings Pub. Co., CA
- Moore, D.M., Editor. 1991. Plant Life. Oxford University Press, NY.
- Moore, R. and W.d. Clark. 1995. Botany: Plant Form and Function, Vol.1. Wm. C. Brown, Boston.
- Niklas, Karl J., Editor. 1995. Botany for the Next Millennium: A Report From the Botanical Society of America. The Society, Columbus, Ohio
- Northington, David K. and Edward L. Schneider. 1996. The Botanical World, 2nd Edition. Wm. C. Brown, Boston.
- Raven, Peter, Ray Evert and Susan Eichhorn. 1992. Biology of Plants, 5th Edition, Worth, NY.
- Stidworthy, John. 1990. Plants and Seeds. Gloucester Press, NY QK 671 S74
- Wilkinson, Robert, Editor. 1994. Plant-environment Interactions. M. Dekker, NY.
- Zimdahl, Robert. 1993. Fundamentals of Weed Science. Academic Press, San Diego.

IV. Standards:

Grades will be assigned in accordance with University policy. They will be based on examinations, quizzes, projects, written assignments, laboratory reports and practical examinations.

Assessment Related to the Objectives:

1. Achievement on lecture and laboratory practical examinations will be used to assess student understanding of the importance of the study of botany. Student understanding of lecture concepts also will be determined by their active participation in lecture presentations. Active participation will be determined by the student's ability to respond to questions posed.
2. Achievement on lecture and laboratory practical examinations will be used to assess student understanding of plant anatomy and cellular structure. Student understanding of lecture concepts will be determined in part by their active participation in lecture presentations.
3. Student understanding of basic pathways that water and nutrients follow as they move throughout the plant body will be determined in part by their active

participation in lecture presentations. Active participation will be determined by the student's ability to respond to questions posed. Achievement on lecture and laboratory practical examinations also will be used to assess student knowledge.

4. Achievement on lecture and laboratory practical examinations will be used to assess student understanding of plant metabolism. Student understanding of lecture concepts also will be determined by the student's active participation and their ability to respond to questions posed during lecture presentations.
5. Achievement on lecture and examinations and verbal responses during discussions will be used to assess student understanding of basic developmental processes in plants and the roles that plant hormones play in growth and development plant anatomy.
6. Achievement on lecture and laboratory practical examinations will be used to assess student ability to describe characteristics and life cycles of the diverse groups within the Plant Kingdom, including bryophytes, ferns, gymnosperms, and angiosperms understanding of plant anatomy.
7. Students will complete written examinations which will test their understanding of topics presented in readings and lecture concerning the evolution of plant anatomy, physiology, and life history.

V. Rationale:

- A. Various forms of assessment of our past and present students suggest that our current students are generally less prepared to handle the rigors of our science courses. As a consequence, we are able to cover less material at the same depth each semester than we did a few years ago. While recommendations from science education authorities (e.g. National Research Council and National Science Teachers Association) stress that the science curriculum must not follow the "mile wide – inch deep" model but instead should provide less content at more depth, there is a limit with respect to how much breadth can be cut from a course of study. This syllabus presents a new model for the course structure of our traditional 200 level lecture/laboratory classes in the Department of Biological Sciences. It provides the time to cover a broader range of topics while allowing these topics to be covered in an appropriate depth by requiring students to be in class for 30 additional minutes each week. No additional credits are allocated to the course. Students will spend one additional hour each week in lecture and one half hour less each week in laboratory. If four laboratories are scheduled each semester, this will actually result in one less faculty contact hour per week.
- B. This course is required of all Biology, Biology/Chemistry and Secondary Education Biology majors, and is designed to provide students with the fundamental concepts of plant biology and a survey of the major taxa of plants and plant-like organisms. The course expands on many of the biological concepts introduced in Principles of Biology while providing students with the fundamentals necessary to support upper level courses with a botanical content such as Introductory Ecology, Aquatic Ecology, Ichthyology, Ornithology, and Entomology. The approach taken is highly integrated, providing students with a comprehensive insight into the relationships between structure and function in plants, as well as an understanding of the role of plants in

human and natural environments. The basic unifying principles of biology such as evolution are stressed, enabling students to integrate information learned in the other core biology courses.

- C. No other Department will be affected.

VI. Cost and Staff Analysis:

- A. This is not a new course, but rather a revision of the syllabus of an existing course and will be taught by current faculty and require resources typical of laboratory biology courses with multiple sections.
- B. This course is taught every Fall semester.

VII. Date Approved by University President:

(Signature)

(Date)