LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
07-24			AP-1/22/08	App 3/25/08

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person	Email Address
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Proposing Department/Unit	**Phone**
Biology	(724) 357-2484

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply)

_X_ New Course _____ Course Prefix Change _____ Course Deletion

_____ Course Revision ___ Course Number and/or Title Change _____ Catalog Description Change

	BIOL 473 Seedless Vascular Plants: Ferns and Allied Flora
Current Course prefix, number and full title	*Proposed course prefix, number and full title, if changing*

2. Additional Course Designations: check if appropriate

_____ This course is also proposed as a Liberal Studies Course. _____ Other: (e.g., Women's Studies, Pan-African)

_____ This course is also proposed as an Honors College Course.

3. Program Proposals

_____ Catalog Description Change _____ Program Revision

_____ New Degree Program _____ Program Title Change _____ Other

_____ New Minor Program _____ New Track

Current program name	*Proposed program name, if changing*

4. Approvals		**Date**
Department Curriculum Committee Chair(s)	Amadufeho	4/9/07
Department Chair(s)	[signature]	4/10/07
College Curriculum Committee Chair	[signature]	10/06/07
College Dean	Genene Bunch	10/11/07
Director of Liberal Studies *		
Director of Honors College *		
Provost *		
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs	Gail Sechrist	3-5-08

* where applicable

Received
MAR 05 2008
Liberal Studies

Received
OCT 15 2007
Liberal Studies

New Course

BIOL 473 Seedless Vascular Plants: Ferns and Allied Flora 2c-3l-3cr

I. Catalog Description

A comprehensive survey of morphological and habitat characteristics of seedless vascular plants (generally ferns and their allies) of Pennsylvania and the surrounding states.

Prerequisite: BIOL 210

II. Course Outcomes

Upon successful completion of this course, students will be able to:

1. discuss the role that seedless vascular plants play in the ecosystems of Pennsylvania.
2. explain the lifecycles and reproductive strategies utilized by seedless vascular plants
3. examine, collect and preserve representative ferns and fern allies.
4. recognize the preferred habitats of indigenous seedless vascular plants in Pennsylvania.
5. identify specific plant relationships between seedless vascular plants and other flora
6. identify ferns and allies in the northeastern portion of the US. by their common and scientific names.

III. Detailed Course Outline

Note: The topics are listed in the intended order of presentation but may be rearranged if necessary. There are two 100 pt. written exams and one 150 pt. field practical exam in this course.

A. Introduction to the terms and requirements of the course (4 academic hrs.)
   1. Course Introduction
   2 Terminology, Variation, & Features of Seedless Vascular Plants
   3. Morphological characteristics and lifecycles of Seedless Vascular Plants
   4. Genetics and hybridization patterns in Lower Vascular Plants

B. Instructor and student presenter will lead discussion on the morphological characteristics and habitats of the fern allies. (6 academic hrs.)
   1. Isoetales/Selaginellales (Quillwort/Spikemoss Families)
   2. Equisetales (Horsetail Family)
   3. Lycopodiales (Clubmoss Family)

C. Instructor and student presenter will lead discussion on the morphological characteristics and habitats of the primitive fern families. (7 academic hrs.)
   1. Schizaea/Lygodium (Curly Grass/Climbing Fern)
   2. Osmunda (Royal Fern Family)
   3. Trichomanes (Filmy Fern Family)
   4. Ophioglossales (Grape Fern Family)

D. Midterm written Exam on Fern Allies and small divisions. (2 academic hrs.)

E. Instructor and student presenter will lead discussion on the morphological characteristics and habitats of the modern fern families. (9 academic hrs.)

1. Polypodium (Wet Cliffloving ferns)
2. Woodsia (Dry Cliffloving ferns)
3. Gymnocarpium (Oak Ferns)
4. Athyrium (Lady Ferns)
5 Polystichum (Holly Ferns)
6. Adiantum (Maidenhair Ferns)
7 Thelypteridaceae (Marsh Ferns)
8. Dryopteris (Wood Ferns)
9. Asplenium (Spleenworts)
10. Cheilanthes/Pellaea (Lip Ferns)

F. Final Written Exam on large Polypodiaceae group (2 academic hrs.)

G. Laboratory sessions: Students will observe and report on habitat restrictions and morphology of representatives of (12 academic hrs.)

1. Seedless vascular plants on IUP's campus
2. Set up fertilization and cultivation investigation
3. Quillwort/spikemoss (Yellow Creek)
4. Horsetails (Dilltown Creek)
5. Clubmoss (Vintondale Bog)
6. Curly grass & Climbing fern (Eastern Pinelands)
7. Grape ferns (Pine Creek Park)
8. Cliffloving Ferns (Ohiopyle)
9. Maidenhair Ferns (Canoe Creek)
10. Marsh ferns (Linn Run Park)
11. Wood ferns (Crooked Creek)
12. Spleenworts (Bedford Cliffs)

H. Final Exams: Written and Laboratory Practical (2 academic hrs)

Total academic hours. 42

V. Evaluation Methods

Midterm Exam (100 pts) This exam will be conducted at the middle of the semester period.

Final Written Exam (100 pts.) This exam will be conducted on the last regular scheduled class session.

Field Practical (150 pts.) This field exam will be conducted in the field over the final exam period

Oral Presentation and Report (total: 30 pts) Each class member will research and present a group of seedless vascular plants to the class. This presentation will last about 15 minutes and take place during the teacher's lecture segment of the course.

Quizzes (70 pts.) The students will take seven quizzes based on information from previous lessons. Quiz scores will be totaled together for points. Missed quizzes can not be made up.

Collection of local Pteridophytes (total: 50 pts). Students will collect and correctly preserve representative ferns or their allies from his/her presentation. Students will

be responsible for correctly preserving 10 different specimens. The collections must be correctly displayed on regulation herbarium sheets and correctly identified with

the scientifically approved label. A description of the location for each specimen and other plot information disseminated in class should also be provided.

V. Grading Scale
- A. 500- 450 points
- B. 449-400 points
- C. 399-350 points
- D. 349-300 points
- E. 299-0 points

VI. Attendance: Information relevant to identification, collection, preservation and display of the ferns will be discussed in every class; it is, therefore, important that students attend each session. In accordance with IUP's course attendance policy, if a student can not attend a session for an acceptable reason (illness or personal emergency), he or she should notify the instructor of the absence within 24 hours of the class. If a student misses more then three clock hours without a legitimate excuse, 10 points will be removed from the student's overall point count for each session missed!

VII. Required Textbooks

Jones, D (1987) Encyclopedia of Ferns, Timber Press, Portland, Oregon

Cobb, B (2006) Peterson Field Guide to the Ferns and Their Allies, Houghton Mifflin, New York.

Strongly Recommended Texts:

Lord, T. & H. Travis (2006) The Ferns and Allied Plants of Pennsylvania. Pinelands Press, Pemberton, New Jersey.

Rhoads & Block (2000) The Plants of Pennsylvania, University of Pennsylvania Press, Philadelphia, Pennsylvania.

V. Special Resource Requirements

There is no laboratory fee or elaborate equipment necessary for this course. Students, however, will be given an inexpensive field lens and a field bag. The bag and lens will be returned at the end of the semester. Since labs or field work are planned each week, biology vans will be used frequently. Students will be expected to dress appropriately for the outdoors (raingear, long sleeves & long trousers, waterproof boots are encouraged); insect (especially tick) spray is highly recommended.

VIII. Student's Class Presentation

Sometime during the professor's lecture, a student will present a 15 minute talk on a specific family of seedless vascular plants. Students will be graded on content and style. Well-planned presentations could earn up to 30 points for the student.

X. Bibliography

Baker J. G. (1997) Handbook of the Fern Allies, George Bell & Sons, London, England.

Berg, L. R. (2006) Introductory Botany, Harcourt Brace & Company, Orlando, Florida.

Bruce, J. (1995) Gametophytes and subgeneric concepts in Lycopodium. *American Journal of Botany,* 55. 919-924.

Cooper-Driver G. & C. Haufler (1993) The changing role of chemistry in fern classification, *Fern Gazette,* 12. 283-294.

Copland, E. B. (1997) Genera Filicum: The Genera of Ferns, Chronica Botanica Co, New York.

Cranfield R. (1980) Ferns and Fern Allies of Kentucky, Kentucky Nature Preserves, Kentucky.

Fernald, M. (1970) Gray's Manual of Botany, 8th ed., Van Nostrand Reinhold Inc, New York.

Hoshizaki, B.J. (1989) Fern Growers Manual, Alfred Knoph, New York.

Mickel, J.T. (1979) How to Know the Ferns and Fern Allies, W.C. Brown & Co, Iowa.

Montgomery, J. & D. Fairbrothers (1992) New Jersey Ferns and Fern-Allies, Rutgers University Press, New Jersey.

Nabors, M.W. (2004) Introduction to Botany, Pearson-Benjamin Cummings, San Francisco, California.

Rhoads, A.F. & W. Klien (1993) The Vascular Flora of Pennsylvania, American Philosophical Society, Philadelphia, Pennsylvania.

Smith J. (1990) Vascular Plant Families, Mad River Press, Eureka, California.

Stern, K. R. (2006) Plant Biology, McGraw Hill Publishing Company, New York.

Tryon, A. F. & R. C. Moran (1997) The Ferns and Allied Plants of New England, Massachusetts Audubon Society, Massachusetts.

Wherry, E. J. (1995) The Fern Guide for Northeastern and Midland United States, Dover Publications, Minneola, New York.

Course Analysis Questionnaire

Section A: Details of the Course:

A1. Seedless Vascular Plants: Ferns and Allied Flora is an elective for the B.S. in Biology, B.S. in Natural Science and B.S. in Education – Secondary Biology.

A2. No. This course is a new course that strengthens the field science offering of Biology Department.

A3. This course has been offered as BIOL 481-581(under the title Pteridophytes of the Eastern U.S.) for two semesters (summer 2001 and fall 2004); one section of 22 students is scheduled as a special topics offering in the fall 2006 course listing.

A4. Seedless Vascular Plants: Ferns and Allied Flora will be offered as an upper-level undergraduate and a graduate course.

A5. This course may not be taken for variable credit.

A6. This course is offered at a number of Colleges and Universities under several different name (i.e.: Pteridophytes, Ferns & Fern Allies, Lower Vascular Plant). Examples of the institutions include:
Iowa State University- BIO 552 Pteridology (ecub.lastate/courses/html)
Homboldt University-BIO 1051 Pteridology (humbolt.edu~catalogue/courses/bot_crs.html)
University of Tennessee-BOT 401 Field Pteridology (web.bio.utk.edu/cox/bot_401.htm)
Univ of Louisiana-BIO 440 Biology of Non-seed Plants (ulm.edu/biology/courses.htm)
University of Berkeley- IB210L Pteridology (ucjeps.berkeley.edu)
Longwood University-BIO 477 Pteridology (longwood.edu/catalog/2000/biology/course
Lakehead University- BIO 3371 Pteridophytes (biology.lakehead.ca/)
University of Puerto Rico-BIOL 5009 Pteridology (http://www.uprm.edu/biology)

A7 *Seedless Vascular Plants: Ferns and Allied Flora* is an important course for biology majors who are specializing in nature studies (Forestry, Park Ranger, Naturalist, Ecologist) or gaining certification to teach students in high school or college introductory, environmental and field courses.

Section B: Interdisciplinary Implications

B1. The course will be taught by one professor.

B2. Seedless Vascular Plants: Ferns and Allied Flora is a unique course with content not met by existing courses at IUP.

B3. This course will be made available to students outside of Biology (geology, elementary education, natural science, geography) and the College of Continuing Education, provided the students meet the prerequisite of Introductory Botany (BIOL 210).

Section C: Implications:

C1. Faculty resources are adequate to teach this course.

C2. The course will utilize the department's computers for lesson (power point), laboratory budget and preparation and vans for transportation to field sites based on the offering of one section every other year (see C5 below).

C3. Resources for this course are not funded by a grant.

C4. This course will be offered either over the summer sessions or during the fall semester according to department course requirements.

C5. One section of Seedless Vascular Plants: Ferns and Allied Flora will be offered over the summer or during the fall semester every other year depending on student course enrollment.

C6. Student enrollment in this course will be limited only by van space.

C7. It is predicted that 2 vans will be assigned to this course and, therefore, a limit of 22 students and a graduate assistant will be established.

Section D: Miscellaneous

D1: This course will be popular with students attracted to the field studies aspect of Biology and with those interested in teaching students about natural environments. Geology majors, keen on the paleontology side of their discipline, will also be interested in this course.