

LSC Use Only
Number: _____
Submission Date: _____
Action-Date: _____



UWUCC USE Only
Number: 00-26
Submission Date: _____
Action-Date: UWUCC App 11/14/00
Senate App 12/5/00

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person THOMAS R. LORD Phone 357-2484

Department BIOLOGY

II. PROPOSAL TYPE (Check All Appropriate Lines)

COURSE DENDROLOGY OF THE EASTERN U.S.
Suggested 20 character title

New Course* BI 471 DENDROLOGY OF THE EASTERN U.S.
Course Number and Full Title

Course Revision _____
Course Number and Full Title

Liberal Studies Approval+ _____
for new or existing course Course Number and Full Title

Course Deletion _____
Course Number and Full Title

Number and/or Title Change _____
Old Number and/or Full Old Title

_____ New Number and/or Full New Title

Course or Catalog Description Change _____
Course Number and Full Title

PROGRAM: _____ Major _____ Minor _____ Track

New Program* _____
Program Name

Program Revision* _____
Program Name

Program Deletion* _____
Program Name

Title Change _____
Old Program Name

_____ New Program Name

III. Approvals (signatures and date)

[Signature]
Department Curriculum Committee

W. Bay But
Department Chair

[Signature]
College Curriculum Committee

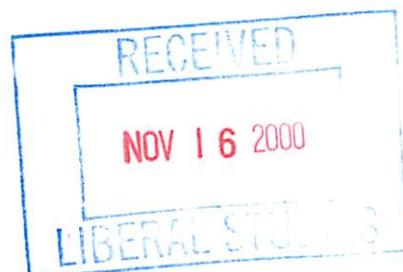
[Signature]
College Dean

+ Director of Liberal Studies (where applicable)

* Provost (where applicable)



Course Syllabus



I. Catalogue Description

BIOL 471 Dendrology of the Eastern U.S. 3 credits
2 lecture hours
3 lab hours
(2c-3l-3sh)

Prerequisite: BIOL 210 or permission of instructor

A comprehensive survey of the tree species in the eastern portion of North America with emphasis on Pennsylvania forests.

II. Course Objectives

As a result of this course students will be able to:

- 1 discuss current research studies concerning silva in the northeastern part of the U.S.
- 2 conduct an analytical study of the silva in a local forest and submit a written report on the findings.
- 3 research and present to the class information on one Family of trees in the northeast
- 4 recognize woody tissues in the roots, stems and leaves both macroscopically and microscopically
- 5 identify the indigenous trees of western Pennsylvania in the field by their common and scientific names

III. Course Outline

- A. Foundation information (2 hour long lectures)
 - 1. Historical Perspectives,
 - 2. Forest Ecology and Ecosystems
- B. Silva Structures (2 hour long lectures)
 - 1. Variation
 - 2. Identification
- C. Lifecycles (2 hour long lectures)
 - 1. Vegetative
 - 2. Sexual

Laboratories for first three weeks (3 labs each 3 hours long)

Laboratory 1 Trees on the IUP Campus

Laboratory 2 Performing a tree census (Quadrat and Linear Methods)

Laboratory 3 Microexamination of woody plants

- D. Deciduous Trees-professor/student presentations & research reports(10 lectures)
 - 1. Salicaceae (*Salix*, *Populus*)
 - 1. Betulaceae (*Betula*, *Carpinus*, *Ostrya*)

2. Fagaceae (*Fagus, Castanea, Quercus*)
3. Ulmaceae (*Ulmus, Celtis*)
3. Moraceae (*Morus, Maclura*)
4. Magnoliaceae (*Magnolia, Liriodendron*)
4. Lauraceae (*Sassafras*)
5. Roseaceae (*Prunus, Malus, Amelanchier, Crataegus*)
6. Leguminosae (*Gleditsia, Robinia, Gymnocladus*)
6. Hamamelidaceae (*Hamamelis, Liquidambar*)
7. Simaroubaceae (*Ailanthus*)
7. Plantanaceae (*Plantanus*)
7. Aquifoliaceae (*Ilex*)
8. Aceraceae (*Acer*)
9. Hippocastanaceae (*Aesculus*)
9. Tiliaceae (*Tilia*)
9. Nyssaceae (*Nyssa*)
10. Cornaceae (*Cornus*)
10. Ebenaceae (*Diospyros*)
10. Oleaceae (*Fraxinus*)
10. Bignoniaceae (*Catalpa*)

Laboratories for Deciduous Trees (5 labs each 3 hours long)

Laboratory 4 Deciduous trees at Blue Spruce County Park

Laboratory 5 Deciduous trees at Keystone State Park

Laboratory 6 Deciduous trees at Yellow Creek State Park

Laboratory 7 Deciduous trees on Crooked Creek Park

Laboratory 8 Deciduous trees in Buttermilk Falls County Park

- E. Review of anatomy , physiology, and taxonomy of deciduous trees (1 hour)
Written Examination on deciduous trees (1 hour)

Laboratory 9 - Field Practical Exam on deciduous Trees (1 lab of 3 hours)

- F. Woody Shrubs-professor/student presentations & research reports(2 1hr lectures)

1. Anacardiaceae (*Rhus, Toxicodendron*)

2. Ericaceae (*Rhododendron, Gaylussacia, Vaccinium*)

3. Rutaceae (*Citrus, Zanthoxylum*)

Laboratory 10 Woody Shrubs & Conifers along Pine Ridge County Park (3 hrs)

- G. Conifer Trees-professor/student presentations & research reports(6 1hr lectures)

1. Pinaceae (*Pinus*)

2. Pinaceae (*Abies, Larix*)

3. Pinaceae (*Picea*)

4. Pinaceae (*Tsuga, Pseudotsuga*)

5. Cupressaceae (*Thuja, Chamaecyparis, Juniperus*)

6. Ginkgoales (*Ginkgo*)

6. Taxodiaceae (*Sequoia*)

6. Taxaceae (*Taxus, Taxodium*)

Laboratories for Conifers (3 labs each 3 hours long)

Laboratory 11 Coniferous trees in Loyalhanna Park

Laboratory 12 Coniferous trees in Conamaugh Park

Laboratory 13 Coniferous trees in Yellow Creek State Park

H. Reports and discussion of students studies on their plot census (2 1hr lectures)
Completed Plot Study Report from each student due

Laboratory 14 Practical Field Exam on the Conifers (1 lab of 3 hours)

I. Comprehensive Final

IV. Evaluation Methods

Examinations (Total 60%)

15% Field Practical 1 This field exam will be conducted about midway through the course and will be based primarily on the deciduous trees of Pennsylvania

15% Field Practical 2 This field exam will be conducted during the second half of the semester and will be based primarily on the coniferous trees of Pennsylvania

15% Written Midterm This written, comprehensive exam will be conducted about the midpoint in the semester and involve both multiple choice and essay questions

15% Written Final This written, comprehensive exam will be conducted during IUP's final exam session and involve both multiple choice and essay questions

10% Quizzes Biweekly short answer quizzes will be given to students throughout the semester to encourage reading and review of content and terminology

15% Oral Presentations and Reports Each class member will be assigned a specific grouping of trees to research and present to the class. The student talks will be given after the lecture segment of hour with written reports turned in at the end of each student's presentation. Students will also present their plot research to the class the last week of classes.

15% Plot Study of Woody Vegetation The class will conduct a study of the tree species in a local forest (probably Whites Woods). Working in teams of two or three, each group will determine the vigor, age, condition, distribution, density, and site productivity of the sylvan populations in a large region with either the linear or the quadrat method of sampling. The analysis will be evaluated in a report (which must include several literature citations, analysis, discussion) and submitted to the professor for evaluation.

V. Required Textbooks

Harlow, W., E. Harrar, J. Hardin, & F. White (1994) Textbook of Dendrology, 8th ed. McGraw Hill Book Inc., New York, New York

Supplemental Field Guide

Petrides, George (1989) Peterson Field Guide to Eastern Trees, Houghton Mifflin Company, Boston, Massachusetts.

VI. Special Resource Requirements

No elaborate equipment is necessary for this course. Students, however, will purchase an inexpensive field lens. Since labs or field work are planned for nearly every meeting, a biology van will need to be available for class use. Students will be expected to dress appropriately (ie: rain/snow gear, waterproof boots) for outdoor work.

VII. Bibliography

- Boerner, R. (1992) Plant lifespan and response to inoculation of vesicular-arbuscular mycorrhizal fungi. *Mycorrhiza* 1: 153-174.
- Brinkman, J. (1994) Nitrogen fertilization effects on foliar nutrient dynamics & autumnal resorption by Ginkgo biloba. *Journal of Plant Nutrition* 17: 433:443.
- Browder, J. (1992) The limits of extractivism *BioSciences* 42: 174-182.
- Castello, J. (1994) Pathogens, patterns and processes in forest ecosystems *BioSciences* 45 16-24.
- Choesin, D. & Boerner R. (1991) Allyl isothiocyanate release and the allelopathic potential of Brassica napus. *American Journal of Botany* 78:1083-1090.
- Cooperband, L., Boerner, R. & Logan T. (1994) Leguminous tree and pasture responsiveness to VA mycorrhizal infection. *Mycorrhiza* 4: 233-239.
- DeMars, B. (1994) Colonization of Capsella bursa-pastoris by vesicular-arbuscular mycorrhizal fungi, *American Midland Naturalist* 132:377-380.
- DeMers, M., J. Simpson, A Silva, L. Berns & F. Artigas (1995) Forrest edges and changes in connectivity. *Conservation Biology* 9:1159-1168.
- Elias, T.S. (1980) The complete Trees of North America: Field Guide and Natural History. Van Nostrand Reinhold Co. New York.
- Fernald, M (1970) Gray's Manual of Botany, 8th ed., Van Nostrand Reinhold, New York
- Gillis, A. (1990) the new forest: An ecosystem approach to land management *BioScience* 40:558-562.

- Grimm, W. (1950) The Trees of Pennsylvania, Stackpole Books, Harrisburg, Penna.
- Hansen, A (1991) Conserving biodiversity in managed forests, *BioScience* 41:382-83
- Illick, J. (1925) Pennsylvania Trees, Pennsylvania Department of Forest, Harrisburg, Pa
- Kost J.(1986) Biomass equations and microsite growth patterns of Cornus florida.
Castanea 51: 153-155.
- Kricher, J. & G. Morrison (1988) Field Guide to Eastern Forest Houghton Mifflin, Chicago
- Leicht P. (1997) Spatial patterns of mycorrhizal infestiveness of soils along a successional chronosequence. *Mycorrhiza*.
- Little, E. (1979) Checklist of United States Trees, US Dept of Agriculture, Handbook #541, Washington D.C.
- Minoletti, M. (1994) Effects of drought and site fertility on seasonal nutrient dynamics and resorption by the understory Viburnum acerifolium *American Midland Naturalist* 131:109-119.
- Newhouse, J. (1990) Chestnut blight *Scientific American* 262:104-111.
- Peterson, R. (1994) A Field Guide to the Trees of the Eastern United States, Houghton Mifflin Company, Chicago.
- Pimentel, D. (1992) Conserving biological diversity in agricultural/forestry systems. *BioScience* 42:354-362.
- Preston, R. (1976) North American Trees. Iowa State University Press, Iowa.
- Probst, J. & Crow, T. (1991) Integrating biological diversity and resource management *Journal of Forestry* 90:12-17.
- Rice, R. (1990) Old-growth logging myths, *The Ecologist* 20: 141-146.
- Romme, W. & Despain, D (1989) The Yellowstone fires, *Scientific American*, 261:37-46
- Rushforth, K. (1981) The Pocket Guide to Trees. Simon and Schuster, New York.
- Smith J. (1990) Vascular Plant Families, Mad River Press, Eureka, California
- Strittholt, J. (1998) Forest interior habit modeling using geographic information systems. *Conservation Biology* 18: 134-142.
- Stocks, D. (1976) A Guide To Nature in Winter. Little, Brown and Company, New York.
- Symonds G. (1994) The Tree Identification Book William Morrow & Company, New York
- Wherry, E. (1994) Some Pennsylvania barrens and their flora: The shale barrens and their endemics. *Bartonia* 34: 8-11.
- Zim, H. & A. Martin (1992) Trees - A Guide to Familiar American Trees, Western Publishing Company, Racine, Wisconsin

Course Analysis Questionnaire

Section A: Details of the Course

A1 How does the course fit into the program of the department? For what students is the course designated.

Dendrology is an elective field course designed to increase the range and breadth of offerings to undergraduate biology majors. Because Dendrology is an elective course, changes in existing department programs are not required.

A2 Does the course require changes in the content of existing courses or requirements for a program? If catalog descriptions of other courses or department programs must be changed as a result of the adoption of this course, please submit as separate proposals all other changes in courses and/or requirements.

Dendrology will not require changes in the content of existing courses or programs in the department.

A3 Has the course ever been offered at IUP on a trial basis (e.g. as a special topic)? If so, explain the details of the offering.

Yes, Dendrology has been successfully offered as a special topics course for 3 years. The first year it was offered the course enrolled 8 students. The second and third times it ran it was filled to capacity (and carried a waiting list of 3-5 students).

A4 Is the course to be a dual-level course? If so, what is the approval status at the graduate level?

Dendrology was offered as a dual-level course all three of its special topics years. During that time about half the students in the class were graduate students while the other half were upper level undergraduates. Credit from the course has had no problem being accepted as part of the student's graduate curriculum.

A5 If this course may be taken for variable credit, what criteria will be used to related the credits to the learning experiences of each student? Who will make this determination and by what procedures?

The course will not be offered for variable credit.

A6 Do other higher education institutions currently offer this course? If so, please list examples.

Other schools do offer Dendrology. It is a popular field course for biology students and

a keystone course for majors interested in careers in forestry, horticulture, ecology and taxonomy. In this state, The University of Pittsburgh, University of Pennsylvania, Penn State University, Lehigh University, West Chester University, Allegheny College and other colleges all offer a field-based tree course in their biology program. Outside this state the course is offered in all the large universities (e.g. Iowa State, Ohio State, Kansas State, West Virginia, Rutgers, Duke, Maryland)

A7 Is the content, or the skills, of the proposed course recommended or required by a professional society, accrediting agency, law or external agency? If so, please provide documentation. Explain why this content or these skills cannot be incorporated into an existing course.

Dendrology is required by state and federal agencies that establish the laws and protect the health of our forest, parks and nature reserves. Professionals in the agencies must understand silva ecology and know silva terminology. This task requires an incredible amount of class, laboratory and field experience. It would not be practical (or possible) to incorporate all these skills into an existing course.

Section B: Interdisciplinary Implications

B1 Will this course be taught by one instructor or will there be a team teaching? If the later, explain the teaching plan and the rationale.

This course will not be taught by more than one instructor.

B2 What is the relationship between the content of this course and the content of courses by other departments.

There is no relationship between this course and courses in other departments of the university.

B3 Will seats in this course be made available to students in the School of Continuing Education?

Nonmatriculated students who meet the prerequisite requirements for Dendrology may register for the course

Section C: Implementation

C1 Are faculty resources adequate? If you are not requesting or have not been authorized to hire additional faculty, demonstrate how this course will fit into the schedules of current faculty. What will be taught less frequently or in fewer sections to make this possible?

Faculty resources are adequate for this course. Dendrology has run for three consecutive years as a Special Topics offering and its content does not overlap with existing courses provided by the department.

C2 What other resources will be needed to teach this course and how adequate are the current resources?

Beside the existing department vans to transport students to and from field sites, there are no additional resources needed for the course.

C3 Are any of the resources for this course funded by a grant?

No

C4 How frequently do you expect this course to be offered?

This course will be offered every other year.

C5 How many sections of this course do you anticipate offering in a single semester?

One section will be offered each time the course is scheduled.

C6 How many students do you plan to accommodate in a section of this course?

It is anticipated that 29 students will be accommodated in the course

C7 Does any professional society recommend enrollment limits or parameters for a course?

No

Section D Miscellaneous

Dendrology has proven to be a popular course. When it was run as a Special Topics course, student evaluations of Dendrology had a 95% agree or strongly agree ratings in all categories of Section A (Instruction/Content of Class), Section B (About the Course), and Section C (Student Satisfaction).