Eastern Illinois University

# REVISED COURSE PROPOSAL

CGS Agenda Item: 11-23
Effective Date: Fall 2011

**Please check one:** ☐ New course ☒ Revised course

## PART I: CATALOG DESCRIPTION

1. **Course prefix and number, such as ART 1000:** BIO 4914
2. **Title (may not exceed 30 characters, including spaces):** Plant Anatomy
3. **Long title, if any (may not exceed 100 characters, including spaces):**
4. **Class hours per week, lab hours per week, and credit [e.g., (3-0-3)]:** 2-3-3
5. **Term(s) to be offered:** ☒ Fall ☐ Spring ☐ Summer ☐ On demand
6. **Initial term of offering:** ☒ Fall ☐ Spring ☐ Summer **Year:** 2011
7. **Course description (not to exceed four lines):** A comprehensive study of the internal structure of vascular plants, focusing primarily on the anatomy of seed plants. The course emphasizes plant development and structural-functional relationships. The laboratory component of this class will introduce students to basic microtechniques and emphasize microscopic plant structure.
8. **Registration restrictions:**

   a. **Identify any equivalent courses**. N/A
   b. **Prerequisite(s)**. BIO 1200G or at least 9 semester hours of biological sciences or junior status.
   c. **Who can waive the prerequisite(s)?**

   ☐ No one ☐ Chair ☒ Instructor ☐ Advisor ☐ Other (Please specify)

   d. **Co-requisites** (course(s) which MUST be taken concurrently with this one): None

   e. **Repeat status:** ☒ Course may not be repeated.

   ☐ Course may be repeated to a maximum of hours or times.

   f. **Degree, college, major(s), level, or class to which registration in the course is restricted, if any:** None
   g. **Degree, college, major(s), level, or class to be excluded from the course, if any:** None
9. **Special course attributes [cultural diversity, general education (indicate component), honors, remedial, writing centered or writing intensive]** None
10. **Grading methods** (check all that apply): ☒ Standard letter ☐ C/NC ☐ Audit ☐ ABC/NC ("Standard letter"—i.e., ABCDF--is assumed to be the default grading method unless the course description indicates otherwise.)
11. **Instructional delivery method:** ☐ lecture ☐ lab ☒ lecture/lab combined ☐ independent study/research ☐ internship ☐ performance ☐ practicum or clinical ☐ study abroad ☐ other

## PART II: ASSURANCE OF STUDENT LEARNING

1. **List the student learning objectives of this course:**

**Undergraduate students enrolled in this course will:**

- participate in class discussions of plant body organization and how it relates to functional constraints and the environment as well as evolutionary constraints (depth of content knowledge, speaking and critical thinking)
- identify plant structures seen using the microscope and draw these structures in notebooks that will be critiqued by the instructor (depth of content knowledge and effective critical thinking)
- develop practical microtechnique skills (i.e., hand sectioning using razor blades, simple stains and fresh plant material) (problem solving and effective critical thinking)
- identify and interpret relevant peer-reviewed, primary literature and critique these sources – topic to be chosen in consultation with the instructor (advanced scholarship through research)
- summarize relevant literature in the form of an in-class oral presentation (advanced scholarship through research, effective oral communication)

**In addition to the learning objectives listed for undergraduate students above, graduate students will also:**

- design an individual research project by applying the practical microtechniques learned in the laboratory (depth of content knowledge, effective critical thinking and problem solving, advanced scholarship through research)
- synthesize what they learned in their original research project with their literature survey and present the results in the form of a written report and an in-class presentation (depth of content knowledge, effective critical thinking and problem solving, advanced scholarship through research, effective oral and written communication)

2. **Identify the assignments/activities the instructor will use to determine how well students attained the learning objectives:**

| | Exam & Final Exams (30-50%) | Laboratory Assignments & Quizzes (20%) | Classroom Participation (10%) | Laboratory Practical Examination (10%) | Literature Surveys (5-10%) | Oral Presentations (5-10%) | Research Paper (10% **grad only**) |
|---|---|---|---|---|---|---|---|
| participation in classroom discussions | X | X | X | X | | X | |
| identification of plant structures | X | X | X | X | | X | X |
| development of practical microtechnique skills | | X | | X | | X | X |
| identification and interpretation of relevant literature | | | X | | X | X | X |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| summarize literature survey (undergraduate) | | | | | | X | |
| design an individual research project (graduate) | | | | | | X | X |
| synthesize original research with literature survey (graduate) | | | | | X | X | X |

**3. Explain how the instructor will determine students' grades for the course:**
The following grading scale will apply to both undergraduate and graduate students: 100-90% = A; 89-80% = B; 79-70% = C; 69-60% = D; 59% or less = fails course

For **undergraduate students**, course grades will be based on:
- Midterm and final exams (4) = 50%
- Laboratory assignments and quizzes = 20%
- Laboratory practical exam = 10%
- Classroom participation= 10%
- Literature survey = 5%
- Oral presentation of literature review = 5%

For **graduate students**, course grades will be based on:
- Midterm and final exams (4) = 30%
- Laboratory assignments and quizzes = 20%
- Laboratory practical exam = 10%
- Classroom participation= 10%
- Literature survey = 10%
- Oral presentation of original research and literature review = 10%
- Written presentation of original research and literature review = 10%

**4. For technology-delivered and other nontraditional-delivered courses/sections, address the following:**
This course will not be technology-delivered.

**5. For courses numbered 4750-4999, specify additional or more stringent requirements for students enrolling for graduate credit. These include:**

**a. course objectives –** Graduate students will be expected to master the course objectives of understanding the basic internal structure of plants and how that structure relates to function, the environment, and evolutionary history. In addition, graduate students will be expected to apply this knowledge to their in-class research projects.

**b. projects that require application and analysis of the course content –** Graduate students will also be required to do an extensive literature survey for independent research projects involving content knowledge, effective critical thinking and problem solving, effective written communication, and advanced scholarship through research. Students will also gain valuable presentation and scientific writing skills.

c. **separate methods of evaluation for undergraduate and graduate students –** Graduate students will be held to higher expectations and more stringent grading criteria in all course work.

6. **If applicable, indicate whether this course is writing-active, writing-intensive, or writing-centered, and describe how the course satisfies the criteria for the type of writing course identified. (See Appendix *.)** N/A

## PART III: OUTLINE OF THE COURSE

**Provide a week-by-week outline of the course's content. Specify units of time (e.g., for a 3-0-3 course, 45 fifty-minute class periods over 15 weeks) for each major topic in the outline. Provide clear and sufficient details about content and procedures so that possible questions of overlap with other courses can be addressed. For technology-delivered or other nontraditional-delivered courses/sections, explain how the course content "units" are sufficiently equivalent to the traditional on-campus semester hour units of time described above.**

| Week | Subject: Lecture and Laboratory |
|---|---|
| 1 | Introduction and overview of plant structure |
| | Lab: Microscopy and basic microtechnique |
| 2 | Cell Structure and primary growth from shoot apical meristems |
| | Lab: Plant cell components |
| 3 | Primary growth from root apical meristems and simple tissues |
| | Lab: Primary meristems |
| 4 | Complex tissues - xylem |
| | Lab: Simple tissues |
| 5 | Complex tissues - phloem |
| | Lab: Xylem and phloem |
| 6 | Steles and secondary meristems |
| | Lab: Steles |
| 7 | Secondary xylem and phloem |
| | Lab: Secondary meristems |
| 8 | Anomalous secondary growth in eudicots and monocots |
| | Lab: Anomalous secondary growth |
| 9 | Root structure and modifications |
| | Lab: Roots |
| 10 | Stem structure and modifications |
| | Lab: Stems and EIU greenhouse field trip |
| 11 | Leaf structure and modifications |
| | Lab: Leaves and UI greenhouse field trip |
| 12 | External and internal secretory structures |
| | Lab: Secretory structures |
| 13 | Flower structure and genetic control of development |
| | Lab: Flowers and EIU greenhouse fieldtrip |
| 14 | Fruit and seed structure |
| | Lab: Project presentations |
| 15 | Project presentations |
| | Lab: Project presentations |

## PART IV: PURPOSE AND NEED

1. **Explain the department's rationale for developing and proposing the course.** The previous version of this course, BIO 3614 (Plant Anatomy) is already offered and covers plant structure as it relates to function. Plants form the basis of most ecological systems and therefore understanding them is extremely important for biologists.

    a. **If this is a general education course, you also must indicate the segment of the general education program into which it will be placed, and describe how the course meets the requirements of that segment.** This course is not a general education course.
    b. **If the course or some sections of the course may be technology delivered, explain why.** This course is not technology delivered.

2. **Justify the level of the course and any course prerequisites, co-requisites, or registration restrictions.**

This course will take the place of BIO 3614 (Plant Anatomy), which will be deleted from the catalogue. The in-depth focus on specific plant structures, as it relates to function, the environment, and evolutionary history, as well as the expectations and course requirements for Plant Anatomy are commensurate with departmental offerings at the 4750-4999 level. Additionally, more general plant courses are already available for our majors at the 3000-level, including BIO 3612 (Plant Evolution and Diversity) and BIO 3510 (Plant Physiology).

This course has historically been offered at the 3000-level, but course expectations and requirements are commensurate with other 4000-level courses in the department (such as Plant Ecology (BIO 4810), Paleobotany (BIO 4892), Bryology (BIO 4946), and Plant Taxonomy (BIO 4948), thus a revision is warranted.

3. **If the course is similar to an existing course or courses, justify its development and offering.**
    a. **If the contents substantially duplicate those of an existing course, the new proposal should be discussed with the appropriate chairpersons, deans, or curriculum committees and their responses noted in the proposal.** N/A
    b. **Cite course(s) to be deleted if the new course is approved. If no deletions are planned, note the exceptional need to be met or the curricular gap to be filled.** BIO 3614 will be deleted and replaced by this course, BIO 4914.

4. **Impact on Program(s):**

    a. **For undergraduate programs, specify whether this course will be required for a major or minor or used as an approved elective.** This course will be an approved elective for undergraduate students in the Biological Sciences.
    b. **For graduate programs, specify whether this course will be a core requirement for all candidates in a degree or certificate program or an approved elective.** This course will be an approved elective for graduate students in the Biological Sciences.

    **If the proposed course changes a major, minor, or certificate program in or outside of the department, you must submit a separate proposal requesting that change along with the course proposal. Provide a copy of the existing program in the current catalog with the requested changes noted.** N/A

## PART V: IMPLEMENTATION

1. **Faculty member(s) to whom the course may be assigned:** This course will be taught by Dr. Barbara Carlsward or any qualified Biological Sciences faculty member.
   **If this is a graduate course and the department does not currently offer a graduate program, it must document that it employs faculty qualified to teach graduate courses.** N/A

2. **Additional costs to students:**
   **Include those for supplemental packets, hardware/software, or any other additional instructional, technical, or technological requirements. (Course fees must be approved by the President's Council.)** A $20 laboratory and field trip fee, which was previously approved by the President's Council for BIO 3614 and will be applied to BIO 4914 by substitution.

3. **Text and supplementary materials to be used (Include publication dates):**

- Dickison, W.C. 2000. Integrative Plant Anatomy. Harcourt Academic Press: New York, New York.
- Evert, R.F. 2006. Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body-Their Structure, Function, and Development. John Wiley & Sons: New York, New York.
- Peterson, R.L., C.A. Peterson, and L.H. Melville. 2008. Teaching Plant Anatomy Through Creative Laboratory Exercises. National Research Council of Canada: Ottawa, Ontario.

## PART VI: COMMUNITY COLLEGE TRANSFER

**If the proposed course is a 1000- or 2000-level course, state either, "A community college course may be judged equivalent to this course" OR "A community college course will not be judged equivalent to this course." A community college course will not be judged equivalent to a 3000- or 4000-level course but may be accepted as a substitute; however, upper-division credit will not be awarded.** A community college course will not be judged equivalent to this course.

## PART VII: APPROVALS

**Date approved by the department or school: February 7, 2011**

**Date approved by College of Science Curriculum Committee: February 25, 2011**

**Date approved by the Honors Council *(if this is an honors course):***

**Date approved by CAA:** **CGS:**

*In **writing-active courses**, frequent, brief writing activities and assignments are required. Such activities -- some of which are to be graded – might include five-minute in-class writing assignments, journal keeping, lab reports, essay examinations, short papers, longer papers, or a variety of other writing-to-learn activities of the instructor's invention. Writing assignments and activities in writing-active courses are designed primarily to assist students in mastering course content, secondarily to strengthen students' writing skills. In **writing-intensive courses**, several writing assignments and writing activities are required. These assignments and activities, which are to be spread over the course of the semester, serve the dual purpose of strengthening writing skills and deepening understanding of course content. At least one writing assignment is to be revised by the student after it has been read and commented on by the instructor. In writing-intensive courses, students' writing should constitute no less than 35% of the final course grade. In **writing-centered courses** (English 1001G, English 1002G, and their honors equivalents), students learn the principles and the process of writing in all of its stages, from inception to completion. The quality of students' writing is the principal determinant of the course grade. The minimum writing requirement is 20 pages (5,000 words).