

Course Title: Invasive Plants and Weeds: Ecosystems to Molecules

I. General Information

Course Number: BI 528

Number of credits: 3 credits

Meetings: T and Th 10:00 – 11:15 am, E005 Plant Sciences

Prerequisites: General Biology

Instructor: Assistant Professor Cynthia S. Brown

Text: Reading assignments from ecological, weed science and other relevant literature will be made each week. Papers will be provided through the Bioagricultural Sciences and Pest Management web page at <http://www.colostate.edu/Depts/bspm/> (Click on "Faculty and Staff", then the "Brown, Cynthia", then the BI 528 link to see the syllabus and links to individual papers)

Course Summary

This course will take a systematic approach (i.e. organized hierarchically) to studying the contributions of the disciplines of weed science and invasion ecology to our understanding of the biology, ecology and control of “problem plants.” We will explore some of the leading theories and evidence about weeds and invasive plants, including: (1) effects on ecosystems, (2) interactions with other plant species in communities, (3) population processes, (4) ecophysiology of individual species and, at the molecular level, (5) shared genetic and biochemical characteristics. The first section of the course will include reading primary literature and local guest speakers who specialize in each of the areas of emphasis. During the final part of the semester, students will suggest and present papers from the most recent weed science and ecological literature that synthesize ideas, integrate across organizational, taxonomic or spatial scales or demonstrate significant progress in the field of invasive plant and weed biology and ecology.

Class meeting format

For the first 12 weeks of the semester, Tuesday class meetings will include an introductory lecture on the topic of the week provided by the course professor or an invited guest speaker who is a specialist in the field. A review paper on that subject will usually be assigned the previous week and should be read before class. Each Thursday, we will discuss one or two scientific papers on the subject of the week. For the final four weeks of the semester, each class will be led by a student (or students) and be a discussion of papers he/she/they have selected.

II. Objectives

- A.** The student will be able to explain verbally and in writing the history of the study of invasive plants and weeds.
- B.** The students will be able to explain verbally and in writing the leading theories of plant invasion biology.
- C.** The student will know which publications to explore for information on plant invasions in weed science and ecology
- D.** Students will be able to evaluate critically, through writing and discussion, the scientific merit, significance and potential impact of published scientific papers.

III. Performance Evaluation

A. Exams. Two take-home exams will be given, one midterm and a final. The exams will provide students with the opportunity to show that they are familiar with and understand the material presented in lectures and readings, and are able to apply it by solving problems.

B. Leading Class Discussion. Each student will lead a class discussion. He or she will be responsible for selecting a paper from recent weed science or ecological literature that synthesizes ideas, integrates across organizational, taxonomic or spatial scales, or demonstrates significant progress in the field. The papers should complement other readings, setting up interesting comparisons and contrasts. For example, the paper may treat the same topic as one previously read, but one paper may be from the weed science literature and the other from the ecological literature. The paper may show complex interactions or be a very conceptually rich treatment of a subject previously covered. Alternatively, the paper may treat a topic that is of great importance, but which was not included in the initial part of the course.

C. Reading/Discussion Questions. Each student must write a set of questions based on the articles he or she selected to direct reading and discussion. The paper will be made available and the questions will be distributed at least one week before the discussion is scheduled.

C. Research Paper. Students will turn in a 5 page literature review and analysis of the **topic** treated by the article selected for the discussion he or she led. The student should summarize the treatment of the topic by the paper discussed as well as supplementary literature. Details of the format will be provided. The research paper must be turned in **within one week** of the student-led discussion.

Grading Scale.

A- = 90 – 92.9%, A = 93 – 96.9%, A+ = 97 – 100%
B- = 80 – 82.9%, B = 83 – 86.9%, B+ = 87 – 89.9%,
C- = 70 – 72.9%, C = 73 – 76.9%, C+ = 77 – 79.9%
D- = 60 – 62.9%, D = 63 – 67.9%, D = 67 – 69.9%
F = <60%

Point Breakdown.

Midterm Exam	100
Final Exam	150
Paper selection	75
Reading/discussion questions	75
<u>Research Paper</u>	<u>100</u>
Total possible points	500