

Syllabus for Entomology 5341 – Biological Control of Insects and Weeds

Spring 2019

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Schedule & Location

Lecture: T Th 1:00-2:15 PM; 490 Hodson Hall

Laboratory: W 9:30 – 11:30 AM; 480 Hodson Hall

Office Hours: 2:15 – 3:45 T Th or by appointment

Required Reading:

- Lecture

Heimpel, G.E. & N.J. Mills. 2017. Biological Control: Ecology and Applications. Cambridge University Press.

- Laboratory

Flint, M. L., & S. H. Dreistadt. 1998. Natural Enemies Handbook. Berkeley, CA, USA, University of California Press.

Grading:

- midterm (25%)

- final (non-cumulative; 25%)

** Note: Undergraduate students will not be responsible for contents of chapters 6, 7 in the Heimpel & Mills book on tests***

- research paper (25%; grade can be improved by oral presentation)

- laboratory grade (25%; based on lab quizzes)

COURSE OUTLINE AND TENTATIVE SCHEDULE

I. Introduction & definitions (3 sessions: 1/22 – 1/29)

Reading: Heimpel & Mills Chapter 1

- A. Definition of biological control
- B. Early history of biological control
- C. Types of biological control

II. Invasion Biology and Classical Biological Control (9 sessions: 1/31 – 2/28)

Reading: Heimpel & Mills Chapters 2, 3, 4, 5

- A. Invasion Biology
- B. Importation BC – The scope of success
- C. Importation BC – Unintended consequences
- D. Importation BC – Competing Risks

MIDTERM EXAM: 3/7 (review for midterm on 3/5)

IV. Augmentative Biological Control (2 sessions 3/12, 3/14)

Reading: Heimpel & Mills chapter 8

- A. Defining success in augmentative biological control
- B. Population dynamics within augmentation programs
- C. Improving augmentative biological control

SPRING BREAK: 3/18 – 3/22

V. Conservation and Natural Biological Control (4 sessions: 3/26 – 4/4)

Reading: Heimpel & Mills chapters 9, 10

- A. Pesticide reduction
- B. Habitat Management
- C. BC and IPM decision-making

VI. Dynamics of Biological Control (6 sessions: 4/9 - 4/25)

Reading: Heimpel & Mills chapters 6, 7

- A. Population regulation and biological control
- B. Models of predator-prey, host-parasitoid systems
- C. Community ecology and biological control
- D. Biological control and Evolution

FINAL EXAM: 5/2 (review for final on 4/30)