RUTGERS Department of Entomology

Syllabus for (11:370:417)

INSECT-PLANT BIOCHEMICAL INTERACTIONS

3.0 CREDITS

Course name: Insect-Plant Biochemical Interactions 11 370 417
Instructor: Dr L.B. Brattsten
Lectures: MW2 (10:55a.m. – 12:15p.m.)
Location: Thompson Hall 201

Offered: Odd-numbered Fall semesters; **Next offered Fall 2019**
Offered together with 16 370 517

Pre-requisites and Other Registration Restrictions: Consent of instructor; Biology 01:119:115&116; Biochemistry 01:694:301; or equivalents.

Text: L.M. Schoonhoven, J.J.A. van Loon & M. Dicke (2005) Insect-Plant Biology. Oxford University Press. 421 p. $110; Papers from the current literature; the entire course will be posted on a Rutgers Canvas website – FA2019 16:370:517:01 / 11:370:417:01 INSCT PLNT INTERACTN

Learning goals:

- Knowledge of the major groups of herbivorous insects and host plant species.
- Understanding of the biochemical & physiological interactions and their evolutions between the plants and the insects.
  Understanding of the consequences of human agricultural and other activities on these interactions.
- Ability to identify the participating plants and insects;
- to design experimental approaches, proper data collection and analysis for improved understanding of the interactions; to devise strategies for accommodating or utilizing these interactions for the benefit of sustained and habitable environments.
- Communicate information to the scientific community and the public.

Testing & grading: [% of final grade]

- 6 online quizzes [90%]
- Lecture attendance [10%]

Assignments & Responsibilities: *Attendance & participation in as many classes as possible, excuses only for a good reason.*

Absence Policy: Students are expected to attend all classes; if you expect to miss a class, please send me an e-mail indicating the date and reason for your absence or send an e-mail to the University absence reporting website: https://sims.rutgers.edu/ssra An email is automatically sent from this site to the instructor.

Accommodations for students with disabilities: *Elevator is available. Quizzes & Exams will be modified in terms of available time as needed.* Full Rutgers policies and procedures are at https://ods.rutgers.edu.

Tentative lecture topics:

Topic
Intro to the course; logistics, grading, assignments, learning goals, overall plan of the course
Finding food, oviposition & mating site plants
Nutrients from plants: amino acids, proteins,
Nutrients from plants: carbohydrates
Nutrients from plants: lipids, trace elements
Nutrients lacking from plants: sodium, cholesterol
Plant defensive compounds - amino acid-based compounds: toxic amino acids, alkaloids, cyanogenic cpds
Plant defensive compounds – terpenoids, steroids
Plant defensive compounds – phenylpropanoids, others;
Communications within plants (intraspecific)
Communications between plants (interspecific)
Inter-phyla communications
Insect communications - pheromones
Insect communications – allomones & kairomones
Plant defenses – insect enzymes, acutely, chronically toxic cpds
Insect defenses - detoxifying enzymes, P450s
Insect defenses - detoxifying enzymes, Non-P450 enzymes,
Synergism & induction, resistance
Target site defenses
Structural defenses – galls, spines, thick cuticle, endophytes,
The rhizosphere, mycorrhizae, carnivorous plants
Pollination, Seed predation, Insect-vectored plant diseases

When is it co-evolution?
Discussions & Reviews in preparation for quizzes

ACADEMIC INTEGRITY:

The university's policy on Academic Integrity is available at http://academicintegrity.rutgers.edu /academic-integrity-policy The principles of academic integrity require that a student:

- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated and no student has an inappropriate advantage over others.

Contact Information:

Dr L. B. Brattsten,
Thompson Hall, Room 133,
e-mail: lb.brattsten@rutgers.edu
phone: 848 932 8166; 732 921 0131
Office Hours: by appointment