

FALL SEMESTER 2019 SYLLABUS
ENT 322 *General and Applied Entomology*

LECTURE: 8:30-9:20 AM M-W-F 323 Ag Science Bldg
LAB: 12:30-3:20 PM Wed 141 Ag Science Bldg

INSTRUCTORS:

Subodh Adhikari	Guest lecturer	subodha@uidaho.edu	Ag Science Bldg #337
Marek Borowiec	Assistant Professor	mborowiec@uidaho.edu	Ag Science Bldg #322A
Sanford Eigenbrode	Professor	sanforde@uidaho.edu	Ag Science Bldg #235
Edwin Lewis	Professor	eelewis@uidaho.edu	Ag Science Bldg #242
Arash Rashed	Associate Professor	arashed@uidaho.edu	Ag Science Bldg #236
Glen Stevens	Research Associate	glens@uidaho.edu	Ag Science Bldg #243

COURSE CONTACT: Arash Rashed; arashed@uidaho.edu; 208-885-5972

OFFICE HOURS: by appointment

COURSE OVERVIEW:

-- lecture (3-credits)

The aim of this course is to provide an overview of insects, their biology, behavior and ecology, as well as their impacts on human ecosystem. In the first few weeks of the semester we will learn about the basic structure and biology of different insect orders. This will be followed by overviews of the evolution morphological and behavioral traits and their functions. Insect ecology (e.g., inter- and intraspecific interactions), their ecological roles in various ecosystems, integrated management of insect pests, and insect biodiversity and conservation will be the primary focus of this course.

-- laboratory (1-credit)

Lab syllabus will be provided at the 1st laboratory meeting.

DESIRED LEARNING OUTCOMES:

Learn and Integrate

Students will gain knowledge about the major elements of General Entomology and how those basic elements apply to insect ecology, economic status and management. Student learning activities in support of those outcomes are these: (1) participate in lecture and lab by collecting/completing in-class notes and by answering ad hoc Instructor questions, (2) complete reading assignments prior to each lecture, (3) examine preserved specimens, (4) prepare outside of class meetings a scientifically-curated arthropod collection, and (5) gain-in-knowledge assessment take-home lecture tests and in-lab practicums. Students will gain heightened appreciation, biological understanding, and continuing interest in the role that insects play in their lives and in their work. Rubrics for assessment will emphasize (1) mastery of entomological principles, facts, terminology, (2) competency in insect identification, and (3) application of knowledge to real-world questions posed by Idaho citizens about insects.

Communicate

Students will practice and improve their oral and written communication skills by completing these activities: (1) keep a Field Collection Journal, and (2) write short-answer and essay replies to questions on several Lecture Quizzes and the 2 Exams. Rubrics for assessment will

emphasize language syntax and mechanics, message context and purpose, and content organization and development.

ARTHROPOD COLLECTION

Students will be provided with a collecting kit with everything necessary for insect collection and curation: a net, specimen kill jar, specimen box, pins, and pinning accessories. The students are expected to deliver a collection encompassing 80 specimens belonging to 10 different insect orders.

TEXTBOOK: None required. However, required readings (including page numbers) are listed on the Lecture Schedule, from below references.

- Larry P. Pedigo and Marlin E. Rice. 2009. *Entomology & Pest Management*. 6th edition. Pearson Prentice-Hall. ISBN-13: 978-0-13-513295-1 (**two copies on 2-hour reserve at UI Library**). NOTE: ONLY USE the 6th edition; older editions have an outdated taxonomic scheme.
- Penny J. Gullan and Peter S. Cranston. 2014. *The Insects: An Outline of Entomology*. 5th edition. Wiley-Blackwell. ISBN-13: 978-1118846155. NOTE: As above, only the latest, 5th edition.
- Louis M. Schoonhoven, Joop J.A. van Loon and Marcel Dicke. 2005. *Insect-Plant Biology*. Oxford. ISBN: 0-19-154582-1.
- Additional references for specific topics will be provided by the instructor

LECTURE NOTES: For some of the lectures, notes will be distributed in-class and posted online at BbLearn and on the IPM Laboratory website (idahoipmlaboratory.org).

GRADING:

You will be evaluated on performance criteria for both lectures and labs as follows:

-- lecture	
Exams (2)	200 Points possible
Discussion and quizzes	100 Points possible
Final	300 Points possible
-- lab	400 points possible (details in Lab Syllabus)
TOTAL	1000 points possible

The course grade you earn will be computed as

A = 100 to 90%, B = 80 to <90%, C = 70 to <80%, D = 60 to <70%, F = < 60%

SPECIAL NOTES ABOUT GRADES:

- (1) **Lecture Quizzes:** Open-book quizzes will be distributed in selected lectures and are due by the end of the class. Quizzes will cover lectures and readings since the previous Quiz.

You may work together with other students or work individually on quizzes, but you must **write your replies and answers in your own words**. Plagiarism (copying someone else's work without giving them credit) will earn you a grade of zero-points on the assignment. Check [UI Library](#) for information on what constitute plagiarism and how to avoid it)

- (3) **Punctual arrival and class attendance is required.**
- (4) The standards for student academic integrity in this course are as described in the University of Idaho Faculty Staff Handbook, Section 2300, Article II.A.1 “Academic Honesty.” SEE <http://www.webpages.uidaho.edu/fsh/2300.html>

OTHER NOTES:

- (1) Classroom etiquette
 - Kindly leave electronic devices on silent mode. **Do not use your cell phones during classroom lectures or labs.**
 - Arrive in the classroom before 8:30 am; otherwise you will miss important announcements and your late arrival will disrupt your classmates.

- (2) Safety procedures
 - If the fire alarm sounds, immediately evacuate the building by way of the stairwell outside Room 141. Walk across Rayburn Street and regroup in the parking lot.

- (3) Concealed Firearms

Effective 1 July 2014, Idaho Code Section 18-3309 permits individuals who have obtained an Idaho enhanced concealed weapon license to possess a concealed firearm on certain university property. The University of Idaho recognizes that a safe and secure environment is critical to maintaining a climate that is conducive to learning. The University of Idaho likewise is committed to an institutional culture of access and inclusion in which critical engagement of course materials, free from intimidation from others, is expected and encouraged.

So that all classroom members feel as free and safe as possible in their participation, **We request that you do not bring concealed firearms into the classroom.** SEE *University of Idaho Administrative Procedures Manual Section 95.12* at <http://www.uidaho.edu/apm/95/12> for the complete policy.

- (4) Classroom civility

It is University of Idaho policy that everyone in this course will be treated with mutual respect and civility, with an understanding that everyone – students, instructors, professors, guests, and teaching assistants – will be respectful and civil to one another in discussion, in action, in teaching, and in learning. Should you feel our classroom interactions do not reflect an environment of civility and respect, I encourage you to meet with any of the course instructors to discuss your concerns. Additional resources include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center’s confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).

- (5) Disability Support Services (DSS)

Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services, located in the Idaho Commons Building, Room 306, in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course. Contact DSS at 208-885-6307, email dss@uidaho.edu or go to www.uidaho.edu/dss.

Fall 2019
Lecture Schedule and Textbook Reading

Class	Date	Topic	Instructor	Reading (pages)
1	26 Aug	Course overview- Importance of insects	Rashed	P&R*(1-13)
2	28 Aug	Insect diversity and roles in civilization	"	P&R (13-28)
3	30 Aug	Insect external structures	"	P&R (35-72)
	2 Sep	Labor Day		
4	4 Sep	Insect internal structures	Borowiec	G&C (56-124)
5	6 Sep	Introduction to nomenclature phylogeny	"	G&C (190-1)
6	9 Sep	Insects on tree of life, non-insect arthropods	"	G&C (228-9)
7	11 Sep	Insect orders-non-insect hexapods, Paleoptera	"	G&C (201-6)
8	13 Sep	Insect orders – Polyneoptera	"	G&C (207-12)
9	16 Sep	Insect orders - Hemipteroids	"	G&C (212-16)
10	18 Sep	Insect orders - Holometabola 1	"	G&C (216-26)
11	20 Sep	Insect orders – Holometabola 2	"	G&C (216-26)
12	23 Sep	Insect evolution 1	"	G&C (228-48)
13	25 Sep	Insect evolution 2	"	G&C (228-48)
14	27 Sep	Exam 1		
15	30 Sep	Evolution of traits- Defense mechanisms	Rashed	Various
16	2 Oct	Insect communication	Lewis	P&R (68-72; 506-18)
17	4 Oct	Mating systems	"	P&R (77-9; 147-50)
18	7 Oct	Endosymbionts	"	TBD
19	9 Oct	Endosymbionts	"	TBD
20	11 Oct	Predation- Optimal foraging theory	"	P&R (313-32)
21	14 Oct	Insects on plants- Host specificity	Eigenbrode	S, vL&D (101-27)
22	16 Oct	Insects on plants- Finding and accepting a host	"	S, vL&D (136-99)
23	18 Oct	Insects on plants- Tritrophic interactions	"	S, vL&D (279-00)
24	21 Oct	Insects on plants- Component and compound communities	"	S, vL&D (245-70)
25	23 Oct	Insects on plants- Interactions with plant pathogen	"	S, vL&D (245-70)
26	25 Oct	Exam2		
28	28 Oct	IPM- Concept and history	Rashed	P&R (551-71)
29	30 Oct	IPM-Monitoring and decision making	"	P&R (216-84)
30	1 Nov	IPM tactics	"	P&R (various)
31	4 Nov	IPM- Insecticides and bioinsecticides	"	P&R (370-450)
32	6 Nov	Bioinsecticide product development	Lewis	
33	8 Nov	Insects in ecosystem- Beneficial insects	Adhikari	P&R (315-21)
34	11 Nov	Insect in ecosystem- Pollination	"	TBD
35	13 Nov	Water world insects	Stevens	TBD
36	15 Nov	Insect tremors	"	TBD
37	18 Nov	Forest insects	"	TBD
38	20 Nov	Insects in CSI	"	TBD
39	22 Nov	Climate change and insects	Eigenbrode	TBD
	Break			
40	2 Dec	Review	Rashed	Various
41	4 Dec	Conserving Biodiversity- Insect Armageddon?	Eigenbrode	Saunders
42	6 Dec	Conserving insect biodiversity- Theory and practice	"	B&L

*TBD: To be determined

P&R: Pedigo and Rice (2009)

C&G: Gullan and Cranston (2014)

S, vL&D: Schoonhoven, van Loon and Dicke (2005)

Saunders: Saunders ME. 2019. No simple answers for insect conservation. American Scientist- [text provided]

B&L: Basset Y and Lamarre GPA. 2019. Toward a world that values insects. Science 364: 1230-1