

**The University of Manitoba
Faculty of Agricultural and Food Sciences**



UNIVERSITY
OF MANITOBA

Faculty of Agricultural
and Food Sciences

COURSE TITLE: Advances in Physiological Ecology of Insects

Department of Entomology

Course Number: ENTM 7240

Academic Session: Winter 2018

Credit Hours: 3

Location, Meeting Days and Class Hours:

Room 107, Animal Science/Entomology Building

Tuesday Thursday 11:30 pm – 12:45 pm

Instructor Information

Name & Title: Dr. Alejandro Costamagna, Assistant Professor
Email: ale.costamagna@umanitoba.ca
Office Location: 217 Animal Science/Entomology Building
Office Phone: 204-474-9007
Toll free 1-800-432-1960 ext. 9007
Office Hours: 10:00 – 12:00 Monday and Wednesday, or by appointment

Name & Title: Jordan Bannerman, Instructor
Email: jordan.bannerman@umanitoba.ca
Office Location: 206 Animal Science/Entomology Building
Office Phone: 204-480-1021
Toll free 1-800-432-1960 ext. 1021
Office Hours: After class, or by appointment

Course Information

Course Description

The effect of environmental factors such as temperature, moisture, light and other organisms on the physiology and ecology of insects.

Grades

Your grade in this course is determined by the following four course elements:

Ecology reading and discussion assignments.....	10%
Physiology literature review assignment.....	10%
Laboratory project.....	20%
Midterm.....	25%
Final exam.....	35%

Letter Grade Equivalency

A+ = >90%; A=80-89%; B+ =75-79%; B=70-74%; C+=65-69%; C=60-64%; D=50-59%; F=<50%.

Assignments

- 1) Details of the ecology reading/discussion and physiology literature review assignments will be made available separately during the related lecture section. The due date for the Physiology assignment is March 22, 2018. Dates for Ecology reading and discussion assignments for each student will be determined during the first two weeks of classes.
- 2) Graduate students shall design and carry out a laboratory project studying some aspect of the physiological ecology of an insect. Normally this insect will be a species other than the student's thesis research organism. The project will be of such a scope that the actual experimental work can be completed in a time equivalent to about 3 hours per week over a 13 week period, or a total of 39 hours. The project should be written up in the style of a scientific paper, which should include a component of literature research sufficient to put the data in context. The paper is due no later than the final day of the examination period, 23 April 2018.

Examinations

Midterm

The midterm is scheduled for February 15, 2018. The test will be returned as soon as it is graded, and before the voluntary withdrawal date.

Final exam

The final examination will be 2 hours in length and will be scheduled during the regular examination period. The format of the examination will be announced closer to the event, but regardless of format, students will be expected to integrate information from all parts of the course in their answers. Grading of the examination will be based not only on factual content, but on organization as well.

Important Dates

First day of course.....	January 4, 2018
Voluntary withdrawal date.....	March 16, 2018
Final day of course.....	April 5, 2018
Exam period.....	April 9 - 23, 2018

Course Policies

Handouts

Some course handout material may be made available to students through the UM Learn system <https://universityofmanitoba.desire2learn.com/d2l/home>. It is your responsibility to learn how to access the page.

Late assignments

For their own protection, students should keep copies of all term work as submitted. Late submission will result in a penalty of 1% of the allocated mark per day. For good cause, a student may negotiate a single extension for each deadline. If the student fails to conform to the new deadline, the 1% penalty will come into force. There are several suitable style guides available to aid students in preparation of assignments. One such guide is that by R.A. Day (How to Write and Publish a Scientific Paper, 5th Edition. 1998. Oryx Press, Phoenix & New York, or any earlier edition).

Missed assignments

All components of the course, including assignments and participation in all in-class discussions, are required and must be completed for a grade to be assigned.

Academic Integrity

Academic dishonesty (as described in the section on General Academic Regulations and Policy in Section 7 of the University General Calendar) will lead to serious academic penalty, see <http://webapps.cc.umanitoba.ca/calendar06/regulations/plagiarism.asp>

Schedule – Winter 2018

Week	Date	Lecturer	Tentative lecture topics
1	Jan 4	ACC/JB	Outline, introductions, objectives & overview
2	Jan 9	ACC	Population growth
	Jan 11	ACC	Population dynamics
3	Jan 16	ACC	Life histories
	Jan 18	JB	Nervous system, structure and function
4	Jan 23	JB	Integration
	Jan 25	JB	Signal reception
5	Jan 30	ACC	Competition /mutualism
	Feb 1	ACC	Predator - prey / host - parasite interactions
6	Feb 6	JB	Digestion
	Feb 8	JB	Respiration and water balance
7	Feb 13	JB	Muscles
	Feb 15	ACC/JB	Midterm Exam
8	Feb 20		Midterm Break, No classes
	Feb 22		
9	Feb 27	ACC	Predation
	Mar 1	ACC	Parasitoids
10	Mar 6	JB	Hormones
	Mar 8	JB	Light
11	Mar 13	ACC	Plant – herbivore interactions
	Mar 15	ACC	Multitrophic interactions
12	Mar 20	ACC	Landscape ecology of insects
	Mar 22	JB	Temperature
13	Mar 27	JB	Temperature
	Mar 29	ACC	Community structure / invasive species
14	Apr 3	ACC	Ecology and physiology of aphids
	Apr 5	JB	Ecology and physiology of bark beetles

Suggested Literature

***Chapman, R., S. Simpson, and A. Douglas. 2013.** The insects: structure and function, 5th ed. Cambridge University Press.

***Chown, S.L. and S.W. Nicolsen. 2004.** Insect physiological ecology: Mechanisms and Patterns. Oxford University Press.

****Gotelli, N. J. 2008.** A primer of ecology, 4th ed. Sinauer Associates.

***Harrison, J. F., H. A. Woods, and S. P. Roberts. 2012.** Ecological and environmental physiology of insects. Oxford University Press.

***Heinrich, B. 1996.** The thermal warriors. Strategies of insect survival. Harvard University Press.

***Klowden, M. J. 2010.** Physiological systems in insects. Elsevier.

***Nation, J. L. 2008.** Insect physiology & biochemistry. CRC Press

****Price, P. W., R. F. Denno, M. D. Eubanks, D. L. Finke, and I. Kaplan. 2011.** Insect ecology: behavior, populations and communities, Cambridge University Press Cambridge.

****Schowalter, T. 2011.** Insect Ecology: an ecosystem approach, 3rd ed. Academic Press, San Diego, CA.

****Speight, M. R., M. D. Hunter, and A. D. Watt. 2008.** Ecology of insects: concepts and applications, 2nd ed. Wiley - Blackwell Science Ltd.

* and ** indicate the preferred books for the physiology and ecology portion of the course, respectively