

Last Updated: January 5, 2026

COURSE TITLE: Physiological Ecology of Insects

Department of Entomology

Course Number: ENTM 4520



Academic Session: Winter 2026

Credit Hours: 3

Location, Meeting Days and Class Hours: Tuesday & Thursday 1:00 pm – 2:15 pm, Helen Glass Centre, room 350

Instructor Information

Name & Title: Dr. Alejandro Costamagna, Professor
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Name & Title: Dr. Nuria Morfin, Assistant Professor
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Course Information

Course Description

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

Prerequisites

ENTM 2050 Introductory Entomology, or consent of instructor.

Grades

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

Ecology reading and discussion assignments.....	15%
Physiology outreach article and proposal	15%
Midterm.....	30%
Final exam.....	40%

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

Details of the assignments will be made available separately during the related lecture section. The due

date for the Physiology assignment is March 17, 2026. Dates for Ecology reading and discussion assignments for each student will be determined during the first two weeks of classes.

Examinations

Midterm

The midterm is scheduled for Tuesday February 24, 2026. 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 final exam is cumulative and may include up to 20% of content from the midterm section. 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 6, 2026
Voluntary withdrawal date.....	March 19, 2026
Final day of course.....	April 9, 2026
Exam period.....	April 11 – 25, 2026

For more information visit: <https://umanitoba.ca/registrar/important-dates-deadlines>

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 and B. Gastel (How to Write and Publish a Scientific Paper, 7th Edition. 2011. Greenwood, Santa Barbara, Calif., 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 & Artificial Intelligence (AI)

Please familiarize yourself with the definitions and regulations of the U of M at <https://umanitoba.ca/student-supports/academic-supports/academic-integrity>. Artificial Intelligence is not permitted to be used in this course; please consult the instructors if you have any questions about AI in this course and refer to the description of the assignments for more information. Academic dishonesty will lead to serious academic penalty (see link above).

Suggested Literature

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

- **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.
- **Schwalter, T. 2022****. Insect Ecology: an ecosystem approach, 5th 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.

Schedule – Winter 2026

Assignments: **EP** = Ecology Paper; **Physiology** = Physiology Assignment

Week	Date	Lecturer	Tentative lecture topics	Assignment
1	06-Jan	All	Outline, introductions, objectives & overview	
	08-Jan	ACC	Population growth	EP1
2	13-Jan	ACC	Population dynamics	EP2
	15-Jan	ACC	Life histories	EP3
3	20-Jan	ACC	Competition /Mutualism	EP4
	22-Jan	NM	Nervous system, structure and function	
4	27-Jan	NM	Sensory transduction 1	
	29-Jan	NM	Sensory transduction 2	
5	03-Feb	ACC	Host - parasite interactions	EP5
	05-Feb	NM	Digestion	
6	10-Feb	NM	Water balance and respiration	
	12-Feb	NM	Muscles	
7	17-Feb		Mid-Term Break	
	19-Feb		Mid-Term Break	
8	24-Feb	All	Midterm test	
	26-Feb	ACC	Predator - Prey	EP6
9	03-Mar	ACC	Plant - herbivore interactions	EP7
	05-Mar	NM	Endocrinology	
10	10-Mar	NM	Seasonal responses	
	12-Mar	NM	Effect of temperature	
11	17-Mar	NM	Thermoregulation	Physiology
	19-Mar	ACC	Multitrophic interactions	EP8
12	24-Mar	ACC	Landscape ecology of insects	EP9
	26-Mar	ACC	Community structure	EP10
13	31-Mar	ACC	Climate change, invasions, conservation	EP11
	02-Apr	ACC	Ecology and physiology of aphids	
14	07-Apr	NM	Ecology and physiology of bark beetles	
	09-Apr	All	Class review	

AC = Ale Costamagna, NM = Nuria Morfin