Last Updated: January 22, 2022

# COURSE TITLE: Physiological Ecology of Insects
# Department of Entomology
# Course Number: ENTM 4520

**Academic Session:** Winter 2022
**Credit Hours:** 3

**Location, Meeting Days and Class Hours:**
UMLEARN WEBEX
Tuesday Thursday 1:00 pm – 2:15 pm

## Instructor Information


**Name & Title:** Dr Rob Currie, Professor
**Email** rob.currie@umanitoba.ca
**Office Location:** 214a Animal Science/Entomology Building
**Office Phone:** 204-474-6020 or 204 798-9020

**Office Hours**: After class, or by appointment

**Name & Title:** Dr. Alejandro Costamagna, Associate Professor
**Email:** ale.costamagna@umanitoba.ca
**Office Location:** 217 Animal Science/Entomology Building
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**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.

**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 literature review assignment……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 24, 2022. 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 March 15, 2022. 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 25, 2022
Voluntary withdrawal date…… …….April 25, 2022
Final day of course…….…….April 21, 2022
Exam period…….April 26 – May 3, 2022

## 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 2022

| Week | Lecture | Date | Lecturer | Tentative lecture topics |
|---|---|---|---|---|
| 1 | 1 | 25-Jan | All | Outline, introductions, objectives & overview |
| | 2 | 27-Jan | ACC | Population growth |
| 2 | 3 | 1-Feb | ACC | Population dynamics |
| | 4 | 3-Feb | ACC | Life histories |
| 3 | 5 | 8-Feb | ACC | Competition /Mutualism |
| | 6 | 10-Feb | RWC | Nervous system, structure and function |
| 4 | 7 | 15-Feb | RWC | Integration |
| | 8 | 17-Feb | ACC | Predator - Prey / Host - parasite interactions |
| 5 | | 22-Feb | | *Mid-Term Break* |
| | | 24-Feb | | *Mid-Term Break* |
| 6 | 9 | 1-Mar | RWC | Signal reception and signal production |
| | 10 | 3-Mar | RWC | Digestion |
| *7* | 11 | 8-Mar | RWC | Respiration and water balance |
| | 12 | 10-Mar | RWC | Insect Behavior |
| 8 | **13** | **15-Mar** | **All** | **Midterm test** |
| | 14 | 17-Mar | ACC | Plant - herbivore interactions |
| 9 | 15 | 22-Mar | RWC | Muscles |
| | 16 | 24Mar | RWC | Hormones |
| 10 | 17 | 29-Mar | ACC | Community structure / Multitrophic interactions |
| | 18 | 31-Mar | ACC | Landscape ecology of insects |
| 11 | 19 | 5-Apr | RWC | Hormones/Light |
| | 20 | 7-Apr | RWC | Light/ Temperature |
| 12 | 21 | 12-Apr | ACC | Biodiversity |
| | 22 | 14-Apr | ACC | Climate change, invasions, conservation |
| 13 | 23 | 19-Apr | ACC | Ecology and physiology of aphids |
| | 24 | 21-Apr | RWC | Ecology and physiology of bees |
| | | | | |

# 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