Last Updated: January 21, 2022

COURSE TITLE: Physiological Ecology of Insects
Department of Entomology
Course Number: ENTM 7240

Academic Session: Winter 2022
Credit Hours: 3

Location, Meeting Days and Class Hours:
Room 219, Animal Science/Entomology Building
Tuesday Thursday 1:00 pm – 2:15 pm

Instructor Information

Name & Title: Dr R.W. Currie, Professor
Email rob.currie@umanitoba.ca
Office Location: 214 Animal Science/Entomology Building
Office Phone: 204-798-9020
Office Hours: After class, or by appointment

Name & Title: Dr. Alejandro Costamagna, Associate Professor
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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 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 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.

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, 3 May 2022.

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**

Schedule – Winter 2020

Week	Date	Lecturer	Tentative lecture topics
1	7-Jan	All	Outline, introductions, objectives & overview
	9-Jan	ACC	Population growth
2	14-Jan	ACC	Population dynamics
	16-Jan	ACC	Life histories
3	21-Jan	ACC	Competition /Mutualism
	23-Jan	RWC	Nervous system, structure and function
4	28-Jan	RWC	Integration
	30-Jan	ACC	Predator - Prey / Host - parasite interactions
5	4-Feb	RWC	Signal reception and signal production
	6-Feb	RWC	Digestion
6	11-Feb	RWC	Respiration and water balance
	13-Feb	RWC	Insect Behavior
7	*18-Feb*		*Mid-Term Break*
	20-Feb		*Mid-Term Break*
8	**25-Feb**	**all**	**Midterm test**
	27-Feb	ACC	Plant - herbivore interactions
9	3-Mar	RWC	Muscles
	5-Mar	RWC	Hormones
10	10-Mar	ACC	Community structure / Multitrophic interactions
	12-Mar	ACC	Landscape ecology of insects
11	17-Mar	RWC	Hormones/Light
	19-Mar	RWC	Light
12	24-Mar	ACC	Biodiversity
	26-Mar	ACC	Climate change, invasions, conservation
13	31-Mar	ACC	Ecology and physiology of aphids
	2-Apr	RWC	Temperature
14	7-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.

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