Last Updated: March 2023

COURSE TITLE: Field Techniques in Entomology
Department: Entomology
Course Number: ENTM 3180

Academic Session: Summer 2023
Credit Hours: 3
Prerequisites and how they apply to this course: None

Location: Campus will serve as a 'home base' but travel to other locations will occur on most days. Transportation is provided.

Date and times: August 21-29, 2023
8:30 AM – 7:30 PM most days with some adjustments for certain activities
Students must be available for all 9 consecutive days of the course

Department Office location: Animal Science Building 214
Department Phone Number: 204-474-9257

Instructor Information

Name & Title: Jordan Bannerman, Instructor, Department of Entomology

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Course Description

Undergraduate Calendar Description

A field course to provide a foundation in field sampling and collection techniques for insects in natural and agricultural ecosystems. 3 credit hours, nine-day intensive field-based course. Prerequisites: None.

Instructional Methods

Nine-day intensive field-based course. Students will gain hands on experience surveying, collecting and curating insects. Students will also gain experience in fundamental field ecology methodology, experimental design, sample processing, managing data and analyzing sample results.

Course Objectives

This course aims to provide students with hands-on experience sampling insect populations in natural and agricultural ecosystems.
Students will learn:

- Insect survey/collection/trapping methods

- Insect ecology
- Sampling design theory

Students will gain experience on:

- Field based techniques for assessing and monitoring insect populations
- Using survey data to make informed-management decisions
- Collection, management, and analysis of ecological data
- Identification and curation of insect specimens

Learning Outcomes

At the end of this course, students will be able to:

- Demonstrate proper insect sampling, monitoring, collecting, and curation techniques
- Recognize the ecological and economic importance of insects
- Design and carry out fundamentally sound field surveys and experiments

Description of Examinations

There are no examinations in this course.

Description of Assignments

Experiment/survey + Lab presentation (30% of course grade): August 29, 2023

Students will complete and present on an experiment or survey that they design and complete during the course. Students should refer to the assignment handout in the course manual for specific assignment instructions and grading details.

Lab manual exercises (25% of course grade): Due August 29, 2023

Students will complete short question sets and exercises related to the experiments carried out as a class during the course.

Curation of insects (25% of course grade): Due August 29, 2023

Insects will be collected during the daily course activities, and students will be responsible for the preservation and curation of the insects. Each student will be responsible for a curated collection of 30 adult insects with the following composition:

- 30 species, minimum of 10 orders and 30 families represented
- A minimum of one Lepidopteran with properly spread wings
- A minimum of one Orthopteran with properly spread wings
- A minimum of five insects mounted on points
- All specimens must be identified to family, at minimum
- All specimens must be correctly labeled to museum standards

Course participation (20% of course grade)

Participation throughout this course is essential. Marks will be assigned for participation in all instructor led experiments, class activities, and for the collection and submission of survey data. Marks will also be allocated for participation during group and class discussions.

Grade Evaluation

Experiment/survey + Lab presentation …….……....	30%
Insect Curation…….……	25%
Lab manual Exercises…….	25%
Participation……	20%

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%.

Texts, Readings, Materials

Required Texts

None

Recommended Texts

Borror, D.J. & White, R.E. (1998). A Field Guide to Insects: America North of Mexico. Second edition. Houghton Mifflin Harcourt.

This field guide is useful for identifying most North American insects to family. If you have a copy, please bring it. A limited number of copies will be available for those who do not have a personal copy.

Supplementary Reading/Handouts

All required materials will be provided by the instructor.

Course Philosophy and Policies

Students' Learning Responsibilities

Students should approach this course with academic integrity, take responsibility for their actions and honor their academic commitments. Students are expected to actively participate in all activities and group discussions during this course. This is a field course, inclement weather may occur, students should be prepared to work under adverse weather conditions. Students are expected to attend all instructional sessions; an absence for even one session would be detrimental to their success in the course. Students are encouraged to ask for assistance whenever they feel it is necessary since there will be little chance to revisit content with the brief course duration. Students should treat their fellow students with respect and foster a cooperative learning environment where other's ideas are heard and discussed.

Why this course is useful?

This course provides hands-on ecological experience with insects in the field. Students will learn about insect sampling, identification, ecology, curation, and data analysis. This course is useful for students pursuing careers in agriculture, ecology, biology, forestry, horticulture, pest control, or conservation.

Who should take this course?

Students in agriculture, biological sciences, forestry, entomology minors or students who are simply interested in learning more about field techniques for sampling insects should take this course. Entomology minor students will find this course useful to take prior to Fall semester entomology courses which require insect collections.

How this course fits into the curriculum

This course is designed to provide hands on experience sampling, identifying, processing, and managing insect samples from the field. This course provides a learning experience that is not available during traditional fall and winter entomology courses in Canada.

Inquiries to Instructor

Students are encouraged to contact their instructor directly during the course, and by e-mail or phone at any other time.

Late Assignments

Penalties for late submission of assignments are 10% per day late. For assignments submitted electronically, the timestamp/date when the e-mail is received into my inbox will be used as the assignment submission date.

Missed Assignments

All items to which marks are allocated (i.e. the lab manual, insect collection, and lab presentation) must be completed to receive a grade in the course. Assignments ten or more days late will receive a mark of zero. Unexcused assignments that are not submitted will receive a mark of zero and an incomplete course grade. When assignments are missed and excused

through written notification such as a doctor's note, evidence of death in the family, or other circumstances beyond the control of the student, a new due date for the assignment may be arranged by contacting the instructor.

Group Work Policies

Students are encouraged to work together throughout the course. Specific instructions regarding appropriate/inappropriate collaboration will be provided where necessary.

Academic Integrity

Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic discipline. Cheating on examinations or tests may take the form of copying from another student or using unauthorized materials during an exam. Academic misconduct on exams and assignments can also include impersonation, duplicate submission, and inappropriate collaboration. A student found guilty of contributing to cheating in examinations or assignments is also subject to serious academic discipline. Electronic detection tools may be used to screen assignments in cases of suspected academic misconduct. Students should acquaint themselves with the University's policy on plagiarism, cheating, exam impersonation and duplicate submission at http://umanitoba.ca/student-supports/academic-supports/academic-integrity

Tentative course schedule – subject to weather and availability of sites

August 21-29, 2023

Day 1
Aug 21
	Morning
	• General sampling techniques collection techniques
	• Ag session 1 (Glenlea)
	  ○ Grasshopper sweep (Exp. 1 part 1)
	  ○ Pitfall collection (Exp. 1 part 2)
	  ○ Lygus thresholds (Exp. 2 part 1)
	  ○ Bee bowl collection (Exp. 3)
	Afternoon
	• Group experiment discussion and planning session
	• Introduction to hypothesis testing (and Exp. 1 part 1)

Day 2 Aug 22	Morning • General insect collection trip - Sandilands • Trap deployment (Exp. 3 and 4) – Sandilands Rd 66E • Mark recapture session 1 (Exp. 6) Afternoon • Curation demo • Student experiment prep time
Day 3 Aug 23	Morning • Student led experiment deployment - Sandilands Rd 66E • Mark recapture session 2 • General insect collection (as time permits) Afternoon • Lab session (Curation, sample processing, analysis)
Day 4 Aug 24	Morning • General insect collection – Location TBD • Indirect measurement (Exp. 7)

	Afternoon • Honey Bees!
Day 5 Aug 25	Morning • Student experiment takedown • Trap collection (Exp. 3/4) • Mark recapture session 3 Afternoon • Forest insects – survey for pest incidence (Exp. 8) • Lab session (curation, sample processing, analysis)
Day 6 Aug 26	Morning • Aquatics (Exp. 9 and 10) Afternoon • Aquatics • Indirect measures of insect abundance (Exp. 7) • Lab session (curation, sample processing, analysis)

Day 7
Aug 27
	Morning
	• Dairy farm visit (Vet ent. Session near Glenlea)
	Afternoon
	• Ag session 2 (Carman/Glenlea)
	  ○ Economic thresholds (Exp. 2 part 2)
	  ○ Natural enemies (Exp. 5)

Day 8 Aug 28	Morning • Flex (in case of prior inclement weather) Afternoon • Group experiment analyses / discussion • Lab session (Sample processing, analysis)
Day 9 Aug 29	Morning • Flex (in case of prior inclement weather) Afternoon • Group presentations / discussion • Curation deadline (collections due) • Course manual deadline (manual due)