AGSC 411/611
Integrated Pest Management (IPM) in Agriculture and Beyond
course syllabus

Instructors: Dr. Andrew Nuss Joy Newton
nuss@cabnr.unr.edu newtonj@unce.unr.edu

Office: FA 311B
Phone: 775-327-5096
Office hours by appointment

Lecture: MWF, 9:00-9:50 am;
Leifson Physics Building Room 300

Course description
This course combines knowledge of integrated pest management of insects and weeds with
analytical, managerial, and communication skills to address real-world problems in a diversity of
management systems.

Student learning outcomes
Students successfully completing this course should be able to:

1) Design a pest management plan that incorporates pest biology, available management tools,
   economic thresholds, environmental and human health risks, and pesticide resistance
   management.

2) Utilize critical thinking for decision making.

3) Find information to comprehend emerging pest control technologies and how they can be
   used to complement existing management tools.

4) (Graduate students) Synthesize literature to examine how past technologies and scientific
   understanding shaped IPM practices over time.

Prerequisites
Introductory biology (BIOL 190, 191, or 192), chemistry (CHEM 121A/L, 122A/L, 201, or 202),
and an upper division specialization (BIOL 437, BIOL 330, or BIOL 300) are prerequisites for
this course.

Textbooks and reading
editors.
References- Weeds of California and Other Western States – University of California
Publication 3488 – DiTomasso & Healy
Silver Core Curriculum
This course satisfies Core Objective 14 (Application). Students will be able to demonstrate their knowledge and skills developed in previous Core and major classes by completing a project or structured experience of practical significance.

This course teaches principles of integrated pest management. Students will apply skills and knowledge from previous classes by designing an integrated pest management program for a specific crop system using IPM principles.

Assessments
Quizzes - 1 per week, 5 points per quiz, covering the reading material.

Exams - There will be a total of 5 exams. Two for each unit, and one final.

Scientific literature discussion - Scientific papers on IPM subjects will be assigned reading to enhance your understanding of the scientific method as it is applied to IPM; in other words, “how we know what we know”. Students will be chosen to introduce various aspects of the paper and lead a class discussion of the topic. Points will be awarded based on student preparedness and class participation.

Integrated pest management project design (meets CO14 requirement)
Students will design an integrated pest management strategy for a crop system of their choosing (with instructor approval) at the beginning of the course and prepare a report. This will be a different writing style from a traditional term paper in that it will follow the format of a professional report, such as a consultant would prepare for a client (example templates will be provided and discussed).

Two revisions of the plan are required. The first draft (40 pts) will be evaluated by your fellow students (20 pts) and their constructive comments will be returned to you. The second draft (40 pts) will be reviewed by the instructor and returned to you with further comments to improve your final report. Information contained in the report must be cited appropriately in an attached references section.

The final report (180 pts) will include:
1) A description of potential insect pests and weeds, and their biology.
2) A mechanism for detecting pests, monitoring their populations, and quantifying damage with clearly defined economic injury levels.
3) Management options, with reasons given for choosing these strategies.
4) Regulatory compliance guidelines to be followed.

A final, 5-10 minute, presentation of the final project design will occur during the final class sessions of the semester (70 pts).
Graduate level assignments
In addition to the above course assessments, students taking the AGSC 611 version of the course will be expected to write two literature reviews on current IPM topics for which they will provide a 10 minute presentation to the class (50 points each). They will also rotate responsibilities serving as moderator during the scientific literature discussions, and must be prepared with appropriate questions to guide the discussion (25 points).

Course point distribution:
Quizzes: 70 points
Scientific literature: 60 points
Section exams: 400 points
Final exam: 120 points
IPM project: 350 points
Total: 1000 points possible

Grading scale:
This course will be graded by letter grade only; no plus/minus grading will be used.

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<tr>
<td>A</td>
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Class time
You are expected to attend class. Computers and phones are not allowed to be turned on during class. They are a distraction to other students. Class time is too valuable to waste.

All class participants are expected to exhibit respectful behavior to other students and the instructor. All students have the right and privilege to learn in class, free from harassment and disruption. Inappropriate or disruptive behavior will not be tolerated and failure to comply with warnings will result in dismissal from class.

Late and make up assignment policy
Students who submit assignments up to one week late will receive a 10% penalty to the grade of the assignment. Assignments submitted over one week late will receive a grade of zero.

Late work may be accepted under certain extenuating circumstances (hospitalization, childbirth, major accident, injury, or bereavement). The instructor must be notified as soon as possible of the extenuating circumstance and determine a deadline with the instructor for submitting the assignment. If such a circumstance prevents the student from taking an exam, a make-up exam will be scheduled.

Academic honesty
Cheating, plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include filing a final grade of "F"; reducing the student's final course grade one or two full grade points; awarding a failing mark on the coursework in question; or requiring
the student to retake or resubmit the coursework. For more details, see the University of Nevada, Reno General Catalog (http://catalog.unr.edu/content.php?catoid=13&navoid=3708).

Ignorance of these regulations is not a defense in cases of infringement.

**Disability Services**
Any student with a disability needing academic adjustments or accommodations is requested to speak with the Disability Resource Center (Pennington Student Achievement Center, Suite 230) as soon as possible to arrange for appropriate accommodations.

**Audio and Video Recording**
Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

**Academic Success Services:** Your student fees cover usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring-center), and University Writing Center (784-6030 or http://www.unr.edu/writing-center). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.

**UNR Equal Opportunity & Title IX policy:** The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, please contact the University's Equal Opportunity & Title IX office at 775-784-1547. Resources and interim measures are available to assist you. For more information, please visit: https://www.unr.edu/equal-opportunity-title-ix.
Weekly schedule

Week 1 (Aug 28th - Sept 1st)
Insect Management Unit 1
Friday: Introduction - Overview of the science of entomology and beneficial versus pest insects.

Week 2 (Sept 4th-8th)
Monday: Labor day, no class
Wednesday: Insect structure and physiology
Friday: Insect classification

Week 3 (Sept 11th-15th)
Monday: Insect life cycle
Wednesday - Ecology of insect outbreaks
Friday - Sampling and surveillance

Week 4 (Sept 18th-22nd)
Monday - Economic decision levels
Wednesday - Theories of pest management
Friday - Natural enemies (biological control)

Week 5 (Sept 25th-29th)
Monday - Ecological management of the crop environment (cultural control)
Wednesday - *1st exam
Weed Management Unit 1
Friday: Introduction, Importance, and Impacts of Weeds

Week 6 (Oct 2nd-6th)
Introduction, Importance, and Impacts of Weeds (continued)
Weed and Plant Classification Systems

Week 7 (Oct 9th-13th)
Weed Ecology
Weed Management Systems other than chemical and biological

Week 8 (Oct 16th-20th)
Monday - Wednesday - Chemical controls including genetic engineering
Friday - *2nd exam

Week 9 (Oct 23-27th)
Insect Management Unit 2
Monday - Insecticides (conventional)
  *IPM 1st draft project report due
Wednesday - Biopesticides
  *IPM peer review of project reports due
Nevada Day Oct 27th No class
Week 10 (Oct 30 - Nov 3rd)
Monday - Resistant plants
Wednesday - Disrupting insect growth, reproduction and development
   *IPM 2nd draft project report due
Friday - Sterile insect technique

Week 11 (Nov 6th-10th)
Monday - Integrating pest management tools
Wednesday - Insect resistance
Veterans Day Nov 10th, no class

Week 12 (Nov 13th-17th)
Monday-Wednesday - Case studies
   - Bark beetle management (low-value production system)
   - Cotton pest control (moderate-value system)
   - Apple pest management (high-value system)
Friday - *3rd exam

Week 13 (Nov 20th-24th)
Monday: Student presentations of IPM plans
   *IPM final project report due
Wednesday: Special topics
Thanksgiving Holiday, Nov 23-24th, no class

Week 14 (Nov 27th-Dec 1st)
Weed Management Unit 2
Classification and history of herbicides
Biological control including insects, diseases, biochemical and bioherbicides

Week 15 (Dec 4th-8th)
Biological control continued
Problems associated with control strategies including herbicide resistance, environmental concerns and invasive species

Week 16 (Dec 11th)
Monday - *4th exam
Prep Day, Dec 13th, no class