

# ENTO 631-Principles of Integrated Pest Management

## SYLLABUS

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**Course Description:** An introduction to Integrated Pest Management (IPM): Concepts, principles, development and application of IPM. IPM constitutes a series of pest control tactics and strategies toward more sustainable agriculture, natural resources, and urban and rural health and well-being.

**Number of credit hours:** Three (3) (2 for the lecture, 1 for the lab)

**Days and times of lectures:** TBD

**Days and Times of Discussions:** TBD

**Room:** 207 Heep Center (HPCT) (Lectures)  
107 Biocontrol Facility (Discussions)

**Office hours:** by appointment;

**Text:** Koul, O., Dhaliwal, G.S., and Cuperus, G.W., 2004, Integrated Pest Management: Potential, Constraints and Challenges, CABI Publishing.

This book is also available online at NetLibrary (<http://www.netlibrary.com>). However, electronic access may be limited depending on server use. This course has been created collecting information from many sources (e.g. book chapters and journal articles). The accompanying readings for each lecture are indicated in between parentheses after each lecture title in this syllabus. All the readings are available on reserve in the west campus library. And most required readings will be posted as PDFs in the course website.

**Book to discuss:** National Academy of Sciences Report on GMOs. Available as a PDF in the course E-campus site.

**Course Format:** Information will be presented by lectures supplemented with computer presentations. Readings associated with the lectures will enforce lecture materials and provide supplemental information. Students are STRONGLY encouraged to read the material associated with each lecture.

**Course Rationale:** As concerns about environmental safety increase worldwide, ways to control agricultural pests with the least possible environmental impact are actively being pursued. Integrated Pest Management (IPM) is a relatively new practice that combines an array of strategies to combat pests in an effective yet environmentally friendly manner. The present course will define IPM and its main components and discuss the ecological underpinnings behind it.

**Course Objective and Learning Outcomes:** The main goal of this course is that students understand how sound IPM practices rely on an understanding of ecological interactions among crops, pests and their natural enemies and to breach the illusionary gap between applied and basic research.

After taking this course, students are expected to:

- **Identify gaps in IPM knowledge so they can pinpoint needed research venues**
- **Identify appropriate stakeholders or groups of interest for a particular pest problem**
- **Identify groups of interest affected by different IPM strategies**

**Teaching Assessment:** We will assess the fulfillment of the course goals and learning outcomes by using exams, quizzes, a written assignment (i.e., a book review), a debate and a 10-minute oral presentation. In addition, graduate students are asked to act as judges of undergraduate 10-minute oral presentations in a panel and are asked to provide a written report to each undergraduate student. Graduate students taken this class are asked to give a 10-minute presentation about what they consider a novel aspect of IPM or about their own research (if it has a connection with IPM) at the beginning of a lab session of their choice.

Participation in classroom and laboratory discussions is strongly encouraged – students will occasionally be called upon in class and asked to work together in groups.

**Discussion Sessions:** This course is complemented by a discussion session in which current topics in IPM are addressed. The discussion sessions use a book review format as an excuse to address issued in IPM. Books are picked to motivate discussion on controversial issues so students can explored the complexities associated with each of the views discussed. In the past we have use Rachel Carson’s book “Silent Spring” and Jeffrey Smith’s book “Seed of Deception” to discuss different topics in IPM. Every semester a different book is discussed.

### **Grading:**

#### **Grade Breakdown**

A = 315 – 350 points

B = 280 – 314 points

C = 245 – 279 points

D = 210 – 244 points

F = 0 – 209 points

**Lecture** = 70% of total grade (245)

Exam 1 = 60 points

Exam 2 = 60 points

Exam 3 = 60 points

Exam 4 = 60 points

Participation = 5 Points

**Discussion** = 30% of total grade (105)

Book Review = 50 points

Discussion Leadership skills = 25 points

Participation = 30 points

**Attendance:** Since my lectures are based on several sources, in order to succeed in this class it is strongly recommended you attend all lectures and discussions.

**Lecture Exams:** Exam dates are annotated on the syllabus. Please note there is no exam during finals week.

**Book Review:** A relevant book related to IPM is discussed each semester. Discussion sessions are scheduled throughout the semester to explore and contrast the views in the book with student's positions on selected topics (see course content below). Graduate students are asked to write a book review paper explaining why the book read is important (or not) and which aspects of IPM practices have positively or negatively been influenced by the ideas exposed in the book.

**Make-up Exams and quizzes:** Make-up exams and quizzes will only be given for valid excuses. Missing exams or quizzes without valid excuses will be graded as zeroes. Excused absentees should be accompanied with a doctor note or any document that could attest the validity of your excuse. Religious holiday absentees or any other kind of conflicting commitment should be notified to me at least a week in advance.

**Americans with Disabilities Act (ADA) Policy Statement:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe that you have a disability requiring accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Cain Hall or call 845-1637.

**Laboratory Safety:** The Department of Entomology is committed to the safety of all students and employees participating in teaching laboratories. To ensure that a safe environment is maintained in our teaching laboratories, it is expected that all students will adhere to general safety guidelines and emergency procedures, as well as course-specific and activity-specific safety instructions provided by faculty and teaching assistants. Laboratory safety and emergency procedures will be reviewed during the first class period and on a regular basis thereafter.

**Academic Integrity Statements: AGGIE HONOR CODE**

“An Aggie does not lie, cheat, or steal or tolerate those who do”.

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. For additional information, please visit [www.tamu.edu/aggiehonor/](http://www.tamu.edu/aggiehonor/)

**Course Content: Recommended readings appear in between parentheses. “Text” = our textbook. Numbers correspond to the book number in the bibliography list (look at the end of the syllabus for the bibliography list).**

**Example: (2 Text: Chap 1) means read Chapter 1 of reference 2 (our Textbook) in the bibliography “Integrated Pest Management, Potential Constraints and Challenges”.**

**\*Book Chapters in red (or bold italics in the colorless printout) are required readings.**

**week 1**

27 Aug *Lab: description/Introductions/Rules of the game/*

28 Aug IPM Definition (2 Text: Chp 1)

30 Aug When IPM (4: Chp 8)

**week2**

3 Sept *Discussion*

4 Sept Ecology in IPM (4: Chp 2)

6 Sept Autoecology (**6: Chp 9**)

**week 3**

11 Sept Biocontrol Principles (1: Chp 2)

13 Sept Biological Control Strategies: Classical Biological Control (1: Chp 3).

**week 4**

17 Sept *Discussion*

18 Sept Biological Control Strategies: Augmentation (1: Chp 4)

**20 Sept - Exam 1**

**week 5**

25 Sept Biological Control Strategies: Conservation Biological Control (1: Chp 5)

27 Sept Safe Biological Control (**1: Chp 18**).

**week 6**

1 Oct *Discussion*

2 Oct Insecticides (3: Chp 4)

4 Oct Insecticide Resistance and Eco-toxicology (3: Chp 4)

**week 7**

9 Oct The pesticide paradox (**2 Text: Chp 8**)

**11 Oct - Exam 2**

**week 8**

15 Oct *Discussion*

16 Oct Host-plant resistance (3: Chp 5)

18 Oct GMOs (**2 Text: Chp 6**)

**week 9**

22 Oct *The transgenic crops controversy (Debate)*

23 Oct GMOs

25 Oct Microevolution and IPM (**Read: Huffbauer & Roderick 2005; Check Audio Companion-Hear it at home**)

**week 10**

29 Oct *Discussion*

30 Oct Semiochemicals (2 Text: Chp 5) (**Check Audio Companion-Hear it at home**)

1 Nov Cultural Control (2 Text: Chp 2) (**Check Audio Companion-Hear it at home**)

### **week 11**

5 Nov *Discussion.*

6 Nov Genetic Pest control

8 Nov - Exam 3

### **week 12**

12 Nov *No Discussion: ESA Meeting*

13 Nov Species ID and IPM (6: Chp 6) (*Check Audio Companion-Hear it at home*)

15 Nov Tri-Trophic Interactions and IPM (*2 Text: Chp 4*) (*Check Audio Companion-Hear it at home*)

### **week 13**

19 Nov *No Discussion: Thanksgiving break*

20 Nov *No class: Thanksgiving break*

22 Nov *No class: Thanksgiving break*

### **week 14**

26 Nov *Discussion.*

27 Nov The Consumer in IPM (*2 Text: Chp 11*)

29 Nov - Exam 4

## **Reading List: Required and Suggested**

### **1.Natural Enemies: An Introduction to Biological Control**

by Ann E Hajek Cambridge University Press. Library Call Number: SB933.3.H37 2004.

### **2.Integrated Pest Management: Potential, Constraints and Challenges (Text)**

edited by Opende Koul, G S Dhaliwal, G W Cuperus CABI Publishing. Library Call Number: SB950.I4577 2004.

### **3.Insect Pest Management**

by David Dent - CABI Publishing. Library Call Number: SB931.D46 1991.

### **4.Introduction to Insect Pest Management**

edited by Robert L. Metcalf, William H. Luckmann - Wiley-IEEE. Library Call Number: SB931. M48 1975

### **5.Insect Pest Management: Techniques for Environmental Protection**

by Jack E Rechcigl, Nancy A Rechcigl CRC Press. Library Call Number: SB933.3.I53 2000

### **6.Insect Pest Management and Ecological Research**

by Gimme H Walter - Cambridge University Press. Library Call Number: SB931.W25 2003

***If this class has motivated you into knowing more about IPM, you should also read:***

Larry P. Pedigo, Entomology and Pest Management. 6<sup>th</sup> edition or younger

Dr. Edward (Ted) Radcliffe. The IPM World Textbook. <http://ipmworld.umn.edu/ipmchap.htm>