

Term Information

Effective Term Spring 2017
[Previous Value](#) Spring 2014

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Add online (DL) offering

What is the rationale for the proposed change(s)?

This course is already being taught in the online (DL) format, but the original course was not submitted as such. To offer it in the summer as just an online course, we are submitting this request.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the request contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area Entomology
Fiscal Unit/Academic Org Entomology - D1130
College/Academic Group Food, Agric & Environ Science
Level/Career Undergraduate
Course Number/Catalog 2101
Course Title Insects and Human Affairs: Pests, Plagues, Poisons and Politics
Transcript Abbreviation PestsPlagues
Course Description Insects are a daily fact of life, exerting major influence on human affairs over the course of history. The course analyses the extensive and sometimes uncomfortable relationships between insects and humans, including historical roots of insect/human interactions, impact of insects on development of scientific thought, use of insects as experimental models in drug design and military applications.
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week, 6 Week
[Previous Value](#) 14 Week, 12 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? Yes
Is any section of the course offered 100% at a distance
Less than 50% at a distance
[Previous Value](#) No, Less than 50% at a distance
Grading Basis Letter Grade
Repeatable No
Course Components Lecture
[Previous Value](#) Recitation, Lecture
Grade Roster Component Lecture

Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites

Exclusions Not open to students with credit for Entomol 102.

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.0702
Subsidy Level	General Studies Course
Intended Rank	Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

General Education course:
Biological Science

Course Details

Course goals or learning objectives/outcomes

- Goals: Students understand the principles, theories, and methods of modern science, the relationship between science and technology, the implications of sci. to address problems of the
- Learning Outcome 1: Students understand the basic facts, principles, theories and methods of modern science.
- Learning Outcome 2: Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
- Learning Outcome 3: Students describe the inter-dependence of scientific and technological events.
- Learning Objective 4: Students recognize the social and philosophical implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

Content Topic List

- Insects in divine texts, myths and fables---the use of insects to explain biological phenomena is explored using the species-scape concept.
- Sound production in insects--students learn about the anatomy and morphology of sound producing organs in insects. The use of insects as inspiration for human music is discussed.
- Biology of Insect-vectored disease--students learn about the anatomy, physiology and morphology of insect-borne disease transmission.
- Fear of insects---the evolutionary roots of fear of insects is explored as well as specific psychological conditions, e.g., delusional psychosis and insects in dreams.
- The Black Death--students study the complex interplay between fleas, rats and the plague bacterium that resulted in one of the most devastating pandemics in human history. The effects on society, medicine and religion are recounted.
- Insects at war--the importance of insect-borne disease in determining the outcome of armed conflict is studied using Napoleonic campaigns in Egypt, Haiti and Russia as examples.
- The Rise of the Pesticide Industry following successful deployment of DDT in WWII is studied. Technological impediments to synthesizing insecticides on a massive scale are studied. The ecological impacts of insecticides are covered.
- Insects as biological weapons of war is covered from biblical times to the advent of the federal agency known as DARPA. Effectiveness of insect-based biological weapons and technological constraints are detailed.
- The potential for using insect secondary chemicals for a variety of purposes ranging from warfare to therapeutic drugs is explored. Technological impediments are highlighted.
- Role of insects in feeding humans around the globe is considered as well as technological and psychological impediments to using of insects as a human food source, especially in western cultures.
- Comparison of insect and human nutrition---anatomy and morphology of insect and human digestive system is studied with emphasis on energy and metabolic requirements of each organism.
- Insects in medicine--the use of insects in medicine is detailed from Pliny's Doctrine of Signatures to the use of maggots to debride wounds in modern hospitals.
- Bugs as drugs---the potential for insect-based products to serve as therapeutics for human disease is explored.
- How insects changed science--the role of insects in elucidating the germ theory of disease is discussed as well as how the nature of science was changed by this discovery.
- Insects and the modern synthesis--T.H.Morgan's work on mutation in *Drosophila* and its importance to the establishment of the modern synthesis is covered.
- Pollination services---The economic value of insects is largely unsung and unnoticed. But, the contributions of pollinators is significant. Students learn how pollination works and about the ecological and pathological threats to pollinators.
- Silk production is another way in which insects/arthropods benefit the economy. The biology and chemistry of silk production is covered as well as a taxonomic look at which organisms make it.

COURSE CHANGE REQUEST
2101 - Status: PENDING

Last Updated: Neal, Steven Michael
03/24/2016

Attachments

- Entomology-2101-Summer-2016-Online-Syllabus.pdf: DL Syllabus
(Syllabus. Owner: Klooster, Wendy Sue)
- 2015-01sp_ENT2101+IP_Fisher.pdf: In-person syllabus
(Syllabus. Owner: Klooster, Wendy Sue)

Comments

- I've added the distance section format, but kept the in-person format option in case Susan (or Megan) decides to teach it that way again in the future.

The last time the course was taught in-person was in Spring 2015, so I've attached that syllabus. *(by Klooster, Wendy Sue on 03/23/2016 02:00 PM)*

- Please also upload in-class syllabus as the reviewing panel will need to be able to compare the DL request to the approved in-class course. *(by Vankeerbergen, Bernadette Chantal on 03/23/2016 10:06 AM)*
- Returned for corrections to the syllabus. *(by Neal, Steven Michael on 03/17/2016 09:36 AM)*
- Revision is needed in the syllabus as per email to Wendy Klooster. *(by Welty, Celeste on 03/15/2016 09:41 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Klooster, Wendy Sue	03/14/2016 04:37 PM	Submitted for Approval
Revision Requested	Welty, Celeste	03/15/2016 09:41 PM	Unit Approval
Submitted	Klooster, Wendy Sue	03/16/2016 03:23 PM	Submitted for Approval
Approved	Welty, Celeste	03/16/2016 03:29 PM	Unit Approval
Revision Requested	Neal, Steven Michael	03/17/2016 09:36 AM	College Approval
Submitted	Klooster, Wendy Sue	03/17/2016 10:27 AM	Submitted for Approval
Approved	Welty, Celeste	03/17/2016 04:22 PM	Unit Approval
Approved	Neal, Steven Michael	03/22/2016 01:24 PM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	03/23/2016 10:06 AM	ASCCAO Approval
Submitted	Klooster, Wendy Sue	03/23/2016 02:00 PM	Submitted for Approval
Approved	Welty, Celeste	03/23/2016 02:42 PM	Unit Approval
Approved	Neal, Steven Michael	03/24/2016 08:05 AM	College Approval
Pending Approval	Nolen, Dawn Vankeerbergen, Bernadette Chantal Hanlin, Deborah Kay Jenkins, Mary Ellen Bigler Hogle, Danielle Nicole	03/24/2016 08:05 AM	ASCCAO Approval

Entomology 2101

Summer Semester 2016; Online Format

Insects and Human Affairs: Pests, Plagues, Poisons & Politics

Dr. Susan Fisher, Instructor

216A Kottman Hall

fisher.14@osu.edu

292-1617

3 Credit Hours

Course Format: 1-5 on-line modules/week
1 on-line exploratory exercise/week
1 on-line quiz/week
Weekly readings from the book
Comprehensive final

Fulfills the General Education Natural Science Requirement for the BA

Course Description: Insects have invaded every environment imaginable from the binding of books to human skin. Thus, insects are a daily fact of life and have exerted considerable influence on human affairs over the course of history. This course analyzes the extensive and sometimes uncomfortable relationship between insects and humans, including historical roots of insect/human interactions both positive and negative, impact of insects on development of scientific thought and use of insects as experimental models in drug design and military applications.

Goals and Expected Learning Outcomes for GE Natural Science-Biological Science:

Goals: Students understand the principles, theories and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

Expected Learning Outcomes:

Learning Outcome 1: Students understand the basic facts, principles, theories and methods of modern science

Learning Outcome 2: Students understand key events in the development of science and recognize that science is an evolving body of knowledge.

Learning Outcome 3: Students describe the inter-dependence of scientific and technological developments.

Learning Objective 4: Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

Read Me Read Me Read Me

Navigating this Course

The course material will be delivered to you in segments called **modules** which are roughly equivalent to lectures in a standard course. The modules are composed of smaller units called **chunks**. In most modules, the chunks will be identified for you. You will be expected to complete up to five modules each week. These are identified on the syllabus. You will access the modules by going to the **content section** of Carmen and downloading the modules identified on the syllabus for that week. Each module consists of a Camtasia presentation that contains a powerpoint file, someone speaking (usually me) and a variety of ancillary materials like videos or sound tracks. **You are advised to take notes on the Camtasia presentations** although you will be able to watch as many times as you wish.

At the end of each module, you will find a **study guide** as the last power point slide. I will use the study guides to write questions for weekly quizzes. Instead of taking hour exams periodically during the semester, you will be asked to take a **quiz** over the modules studied during each week. This means that you will take a total of 14 quizzes, each of which is worth 40 points. You may drop the two lowest scores at the end of the course. The quizzes for a given week will be available to you starting Thursday at 5:00 pm and continuing until Sunday at 5:00 pm. You must complete the quizzes during this timeframe or provide a medical excuse for not doing so. You will have 30 minutes to complete each quiz once you open the quiz. Once you have started the quiz, you will not be able to exit without losing credit for the quiz, so please think about this before you start. The quizzes are incredibly important as they constitute the majority of your final grade. I strongly recommend that you take each and every quiz even though we will drop the two lowest scores. Why do I say this? If you decide to skip the first two quizzes, for instance, you will be stuck with your scores on the remaining 12. If you miss another quiz for some unforeseen reason, you will have a dropped quiz. Also, I don't give make up quizzes. Let me say that again in all bolded caps: **I DON'T GIVE MAKE UP QUIZZES. Please don't ask for one unless you can provide a valid medical excuse.** If you do ask for a make-up quiz for any other reason than an illness or accident accompanied by a valid medical excuse, I will simply refer you to page 2 of the syllabus, which you are now reading. And if you discover something inconvenient like you can't get an internet connection and you've waited until 4:30 on Sunday to take the quiz, you now have a dropped quiz. You have a 72 hour window in which to take each quiz. So, if you've waited until the last minute and can't get an internet connection, I am afraid it will not persuade me to engage in the two hours necessary to produce a new quiz for one person. This is an unfortunate reality in a big on-line course, so I ask you, nay, plead with you to plan ahead and be **very aware of deadlines.**

So that you don't feel completely lost, I have collated the assignments by week on the syllabus. This provides you with a week by week schedule so that you can keep pace with the course materials. Please print the syllabus out as well as the exploratory exercise documents because you will need to refer to them often.

The biggest impediment to success in the online course is waiting too long and then not having enough time to do a good job. We have tried to minimize the tendency to put things

off by having clear schedules and expectations. This course will require a significant level of industry and maturity on your part, however. There is help if you find you are not doing as well as you would like though. First, you are very welcome to contact me--- by email or by phone or in person. I will be HAPPY to meet with you at your convenience to discuss how you're doing in the course and how to do better if that is a concern. Second, you will have access to the two GTAs whose contact information is listed for you on the first page of the syllabus. They will be available to take your questions and help explain the lecture material as well as the exploratory exercise material by phone or email or in person. Please let us know if you need additional help and please don't wait until the last minute to seek help if you are in trouble. Working together, we can help you navigate the course if we know what you need.

A word about the exploratory exercises:

An important part of this course is contained in the exploratory exercises. These will allow you to take information learned in the modules, and do some independent thinking about the issues that we're studying in class. You are not required to physically come to OSU to satisfy any of the requirements of the course. All of the material and assignments can be completed on-line at a location of your choosing. The GTAs will be available to help you by email if you need assistance.

In the exploratory exercises, of which there are 11, you will be asked to do something each week. This may include watching a video, doing a computer simulation, answering questions or designing an original piece of your own. **There are 20 points attached to each exercise which will serve as the basis for your grade. Please note the due dates. Answer keys for each exploratory Exercise will be posted on Carmen. A FINAL WORD OF IMPORTANCE (NOTE THE CAPS AND BOLD): ONCE THE ANSWER KEY FOR THE EXPLORATORY EXERCISE IS POSTSED, NO FURTHER EXPLORATORY EXERCISES WILL BE ACCEPTED EVEN WITH A VALID MEDICAL EXCUSE.**

Textbook: For the first time, a textbook is available for this course. It is a book that I have written specifically for this course. I am in the process of getting it published but it was not possible to get it to you in final form in time for summer 2016. But, this is good news for you. In compensation for putting up with some typos (which I hope you will point out to me), you will be getting the book for free. I will simply post an electronic copy on Carmen and you won't have to purchase anything. You will be assigned a couple of chapters each week. The chapters cover the same material that you'll be going over in class but in a little more detail. You will be responsible for both the materials covered in the modules and as well as the book on quizzes.

So, in summary, the basic workload of this course consists of:

- Watching two-three Camtasia Modules per week
- Taking one on-line quiz per week
- One exploratory exercise per week
- Weekly readings from textbook
- Comprehensive final

Course Content

Modules

Week *Module Topics* *Textbook Assignment*

Part I: Insects and Humans: We're not so different

1	Introduction to Course	Introduction to book
	Breath of Life (Respiration)	Introduction to Part I
	Fixite du Milieu Interieur	Chapter 1
	Digestion/Excretion	Chapter 2
	Growth & Development	Chapter 3

Quiz 1 covering modules and book chapters from week 1.

2	Weird Reproductive Habits	Chapter 5
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Part II: Insects and the foundations of human culture and aesthetics

2	Insects in Myth	Introduction to Part II & Chapter 6
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Quiz 2 covering modules and book chapters from week 2.

Exploratory Exercise 1

3	Insects in the Bible & Torah	Chapter 7, Part I, pp. 1-22
	Insects in the Qu'ran	Chapter 7, Part I pp 22-29
	Buddhism	Chapter 7, Part II, pp 29-33
	Insectotheology	Chapter 7, Part III, pp. 33-50

Quiz 3 covers modules and book chapters from week 3.

Exploratory Exercise 2

4	Insecta Musica	Chapter 8
	Sound Production in Insects	Chapter 9

Quiz 4 covers modules and book chapters from week 4.

Exploratory Exercise 3

5 Fear of Insects Chapter 10

Part III: Insects as Agents of Historical Change

5 Evolution of Blood Feeding Introduction to Part III & Chapter 11

Quiz 5 covers modules and book chapters from week 5.

Exploratory Exercise 4

6 Most Prolific Serial Killers Chapter 12
Columbus, Malaria & Slavery Chapter 13

Quiz 6 covers modules and book chapters from week 6.

Exploratory Exercise 5

7 Biology of Bubonic Plague Chapter 14
Effects upon Art & Literature Chapter 15

Quiz 7 covers modules and chapters from week 7.

Exploratory Exercise 6

8 Impact of Plague on Medieval Society Chapter 16

Quiz 8 covers modules and chapters from week 8.

Exploratory Exercise 7

9 Napoleon in Egypt, Haiti and Russia Chapter 17
DDT: Miraculous Powder Chapter 18
or Elixir of Death?

Quiz 9 covers modules and chapters from week 9.

Exploratory Exercise 8

Part IV: Insects Working for Us

10 Bioterrorism: Soldiers with Six Legs Introduction to Part IV & Chapter 19
Insect Defense Compounds Chapter 20
& Their Manipulation by Humans

Quiz 10 covers modules and chapters from week 10.

Exploratory Exercise 9

11 Insects in Medicine
You Eat What??

Chapter 21
Chapter 22

Quiz 11 covers modules and chapters from week 12.

Exploratory Exercise 10

12 Insects & the Germ Theory of Disease
Fruit Flies and the Modern Synthesis
Silk
Pollination & Honey

Chapter 23
Chapter 24
Chapter 25
Chapter 26

Quiz 12 covers modules and chapters from week 12.

Exploratory Exercise 11

All Insect Articles & Summaries for Extra Credit due by the last Friday of the semester at 5:00 PM. Email any articles plus summaries directly to Dr. Fisher.

Final Exam: because final exam slots are determined by the date and time that the class meets, and there are no specific meeting times for on-line courses, there is no university-sanctioned time and date for the final exam in this course. What I do is to set a fairly wide window in which you need to designate 2 hours to take the final. My goal is to set the window wide enough that everyone can take it without conflicting with traditional courses and their scheduled finals but not so wide that you forget to take it. This actually happened one year when 6 graduating seniors forgot to take the final.

Course Evaluation and Assessment

Your grade in this course will be determined from the following:

Assessment of Lecture Content:

1. Weekly quizzes covering 2 modules per week **440** points (there are 12 quizzes but you're allowed to drop 1)
2. **Comprehensive On-line Final—200** points

Assessment of Exploratory Exercise Content:

3. **11 Weekly Exploratory Exercises—220** points
These will be filled out during the week assigned and turned in electronically by the beginning of your next recitation. All of the exercises are worth 20 points.
4. **Insects in the News:** You may earn 2 points of **extra credit** (up to 20 points per student) for each insect-related article or story you send electronically **ALONG**

WITH A SHORT SUMMARY OF ITS CONTENT to Dr. Fisher on or before April 8, 5:00 PM. We may use the articles to explore how effectively the scientific method is reflected in the popular press and how insects influence our understanding of contemporary society. **To repeat: you can earn 2 points for each of up to 10 articles, by writing a one paragraph summary of the content and emailing the article and the paragraph directly to Dr. Fisher.**

Total Possible Points in Course: 860

Grading Scale:

93-100	A	90-92	A-
87-89	B+	83-86	B
80-82	B	77-79	C+
73-76	C	70-73	C-
67-69	D+	60-66	D
>60	E		

Online Exploratory Exercise Schedule

You will be completing weekly on-line exploratory exercises of which there are 12. Each week, a specific Exploratory Exercise will be assigned on Wednesday. You will be handing something in for each week. In each case, the written materials you will be handing in are **due on Wednesday of the following week by 5:00 PM. PLEASE DEPOSIT YOUR WRITTEN RESPONSES ELECTRONICALLY INTO A DROP BOX THAT HAS BEEN SET UP IN CARMEN FOR THE EXPLORATORY EXERCISES EACH WEEK.** The point value of these assignments is 20 points. We will also use the exploratory section to make sure that you learning material specified in the Learning Outcomes for this course. Below you will find a general description of what you'll be doing each week. Additional details will be provided for you each week in a document written for each exercise which will be posted on Carmen.

1. Students will view the videos “Know the Difference: Hypothesis vs. Theory”, and “Know the Difference: Science vs. Religion” which are available on YouTube, discuss evidence-based ways of knowing and categorize statements of different types.
2. Create an insect myth to explain some biological principle. Students will examine insect photos, look up sources on line that discuss the ecology and feeding habits of an insect of their choosing and write an original myth to explain some aspect of the insect's habits.

3. Insects in Music—students will examine the appearance of insects in music of different types. Students will select a piece of music and analyze the piece for its entomological significance, the composer and his work.

4. Fear of insects, a cinematic experience—students will watch an insect-themed movie. Then, they will evaluate the accuracy of how insects are depicted in horror films and examine the reasons that people fear insects.

5. Insects and human disease—Students will read about methods for tracking the spread of pandemic diseases. Students will make predictions about the spread of insect-vectoring diseases.

6. Students will understand the specific factors relevant to the spread of insect- vectoring pandemic disease by playing the computer game Pandemic. Students will run and report the results of multiple scenarios in which the disease- factors are altered.

7. The Black Death. Students will watch the award winning video, The Black Death (produced by the History Channel) on OSU's Secured Media Library. Students will then be asked to answer questions and analyze a common claim about the plague and do internet research to reach a conclusion about its validity.

8. Silent Spring—the movie and the book. Understanding environmental toxicology and social impact of insecticides. Dry lab: Altering the speed with which resistance to insecticides occurs.

9. Insects and Human nutrition—a comparative study. Students will gather information about the dietary habits of entomophagous cultures in the contemporary world, calculate the adequacy of these diets to meet the FDA's requirements for an adequate diet and compare the results to their own eating habits which each student will be asked to track for a week.

10. Students will perform a dry lab based on Thomas Hunt Morgan's experiments with *Drosophila melanogaster* to reveal the genetics of mutation in the fruit fly.

11. Pollination Ecology—What would happen in a world without pollinators? Students will perform a thought experiment in which they identify factors affecting the survival of pollinators and make predictions based on different levels of survival.

Absences: This is an online course so you are free to do the work in a timeframe suitable to you. If you are too ill to take a quiz, please contact your TA or Dr. Fisher within window allocated for the quiz. You must be seen by and receive written documentation from a professional health care practitioner documenting your inability to take the quiz during the window the quiz was available. Other serious personal problems will be considered, in advance, on an individual basis. In all instances, documentation supporting the excused absence will be required.

Academic Misconduct: OSU has a strict code of academic that requires us to report any and all cases of suspected misconduct (e.g. cheating on an examination, plagiarism in written assignments WHICH INCLUDES COPYING ANSWERS FROM ANOTHER STUDENT, using an examination proxy, failure to follow course policies etc.) to the OSU Committee on Academic Misconduct for adjudication. “It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term ‘academic misconduct’ includes all forms of students’ academic misconduct wherever committed: illustrated by, but not limited to, cases of plagiarism and dishonest practices in connections with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).”

PLEASE NOTE: THE WORK YOU DO ON EXPLORATORY EXERCISES MUST BE YOUR OWN. STUDENTS WHO SUBMIT IDENTICAL ANSWERS FOR EXPLORATORY EXERCISES WILL RECEIVE A ZERO FOR THE ASSIGNMENT AND, CONSISTENT WITH UNIVERSITY RULES, WILL BE REFERRED TO THE COMMITTEE ON ACADEMIC MISCONDUCT.

Accommodation of Special Needs: Students with disabilities that have been certified by the Office of Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Ave; telephone: 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

Sexual Harassment: OSU considers sexual harassment offenses to be unacceptable behaviors that erodes the quality of the learning environment. Please report any concerns about questionable behavior to Dr. Fisher.

Syllabus

In-Person Version

Entomology 2101
Insects and Human Affairs: Pests, Plagues, Poisons & Politics
Spring 2015
Dr. Susan Fisher, Instructor
216A Kottman Hall
fisher.14@osu.edu
292-1617
3 Credit Hours

Course Format: 2 lectures/week
1 on-line exploration exercise/week
Readings each week
1 Recitation per week

GTA: Andrea Kautz (kautz.14@osu.edu)

Fulfills the General Education Natural Science Requirement for the BA

Course Description: Insects have invaded every environment imaginable from the binding of books to human skin. Thus, insects are a daily fact of life and have exerted considerable influence on human affairs over the course of history. This course analyses the extensive and sometimes uncomfortable relationship between insects and humans, including historical roots of insect/human interactions both positive and negative, impact of insects on development of scientific thought and use of insects as experimental models in drug design and military applications.

Goals and Expected Learning Outcomes for GE Natural Science-Biological Science:

Goals: Students understand the principles, theories and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

Expected Learning Outcomes:

Learning Outcome 1: Students understand the basic facts, principles, theories and methods of modern science

Learning Outcome 2: Students understand key events in the development of science and recognize that science is an evolving body of knowledge.

Learning Outcome 3: Students describe the inter-dependence of scientific and technological developments.

Learning Objective 4: Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

Course Structure and Measurement of Progress

The information content for this course is delivered primarily in the two lectures that are held each week. In addition to the lectures, you will be expected to complete two exploratory exercises (explained below) each week and readings that will be posted on Carmen. Your progress in assimilating and understanding the material will be measured by two hour exams and a comprehensive final.

In addition to attending two lectures per week, this version of the course has a formal recitation that meets for two hours on Friday morning. In the recitation section, you will have two responsibilities: 1) You will be asked to read materials posted on Carmen that will provide information that backs up what you're learning in lecture and expands the material beyond what is covered in class. The reading materials posted on Carmen, thus, taking the place of a text book for this course. One purpose of the reading material is to serve as the basis for discussion in recitation. You will receive a grade for discussion each week of between 0-5 points; 2) You will be asked to complete an Exploratory Exercise each week for 12 weeks. These will allow you to take information learned in the lectures, and do some independent thinking about the issues that we're studying in class. The recitation exercises may include watching a video, doing a computer simulation, answering questions or designing an original piece of your own. You will go over these assignments with the GTA each week in recitation and then complete the assignment on your own. **There are 10 points attached to each exercise which will serve as the basis for your grade. Please note the due dates. Keys for each exploratory Exercise will be posted on Carmen. A FINAL WORD OF IMPORTANCE (NOTE THE CAPS AND BOLD): ONCE THE ANSWER KEY FOR THE EXPLORATORY EXERCISE IS POSTED, NO FURTHER EXPLORATORY EXERCISES WILL BE ACCEPTED EVEN WITH A VALID MEDICAL EXCUSE.**

Getting Help:

So that you don't feel completely lost, I have collated assignments by week on the syllabus in the Carmen content section. The document offers a week by week schedule so that you can keep pace with the course materials. Please print this file along and exploratory exercise documents because you will need to refer to them often.

If you discover that you need additional help in getting through the course, we are happy to assist in several ways. First, you are very welcome to contact me--- by

email or by phone or in person. I will be HAPPY to meet with you at your convenience to discuss how you're doing in the course and how to do better if that is a concern. Second, you will have access to the GTA whose contact information is listed for you on the first page of the syllabus. She will be available to take your questions and help explain the lecture material as well as the exploratory exercise material and reading in Recitation. It is important to come to recitation prepared to discuss the readings and to ask questions about the exploratory exercise for that week. Ideally, you will have already read the Exploratory Exercise over and completed whatever additional work, e.g., watching a video if it is required. Recitation is valuable time and if you use it wisely, you will never be in the position of trying to figure out on your own what you're supposed to do for an exploratory exercise. Please let us know if you need additional help and please don't wait until the last minute to seek help if you are in trouble. Working together, we can help you navigate the course if we know what you need.

Basic workload for the course, thus, consists of:

- Attending two lectures per week
- Taking two lecture exams and a comprehensive final
- One Exploratory Exercise per week for 12 weeks
- Weekly readings for 14 weeks
- 1 recitation per week

Course Content

I. Lectures

Week	Lecture	Date	Lecture Topic
1	1	1/13/15	Introduction and Administrivia
Part 1: Insects and Humans: We're not so different			
1	2	1/15/15	Insects vs. Human Anatomy and Physiology (Dr. Megan Meuti)
Readings, week 1, assigned 1/12, due 1/16			

2 3 1/20/15 Insect & Humans: Weird Mating Rituals

Part 2: Insects and the foundations of human understanding of the world

2 4 1/22/15 How Humans Understand the World: Insects as Myth

Readings week 2, assigned 1/16, due 1/23

3 5 1/27/15 Faith and Biology: Insects and the Abrahamic Faiths

3 6 1/29/15 Insects and Other Faiths
Readings, week 3 assigned 1/23, due 1/30
Exploratory Exercise 1 assigned 1/21, due 1/28

4 7 2/3/15 Insectotheology

4 8 2/5/15 Sound Production by Insects
(Andrea Kautz, MS student)
Readings week 4, assigned 1/30, due 2/6
Exploratory Exercise 2 assigned 1/28, due 2/4

5 9 2/10/15 Insects in music/human collaborations with insects

5 2/12/15 **First Hour Exam** (lectures 1-9)

Readings week 5, assigned 2/6, due 2/13
Exploratory Exercise 3 assigned 2/4, due 2/11

Part 3: Insects and Humans as Combatants

6 10 2/17/15 Fear of Insects

6 11 2/19/15 Insect Serial Killers: Evolution of Blood Feeding

Readings week 6, assigned 2/13, due 2/20
Exploratory Exercise 4 assigned 2/11, due 2/18

7 12 2/24/15 Society's most prolific serial killers

7 13 2/26/15 Malaria and Slavery in the US

Readings week 7, assigned 2/20, due 2/27
Exploratory Exercise 5 assigned 2/18, due 2/25

8 14 3/3/15 Flee Wikkyd Heires and Loose Women: A Primer on the
Biology of the Black Death

8 15 3/5/15 Effects of the Black Death on Art, Literature, Society

Readings week 8, assigned 2/27 due 3/6
Exploratory Exercise 6 assigned 2/25, due 3/4

9 16 3/10/15 Was Napoleon Defeated by Insects? Three Case Studies:
I. Napoleon, Plague and Egypt

9 17 3/12/15 II. Yellow Fever, Napoleon & Haiti

III. Typhus, Napoleon and the Russian Winter

Readings week 9, assigned 3/6, due 3/13
Exploratory Exercise 7 assigned 3/4, due 3/11

Spring Break 3/16-3/20

10 18 3/24/15 DDT: Miraculous Powder or Elixir of Death?

3/26/15 **Hour Exam Two** (lectures 10-18)

Readings week 10 assigned 3/13, due 3/27
Exploratory Exercise 8 assigned 3/11, due 3/25

Part 4: Insects working for us

11 19 3/31/15 Soldiers with Six Legs

11 4/1/15 **Optional Extra Credit Opportunity:** Dr. Jeffrey
Lockwood will give a seminar on April 1 (not a joke) in 244 Kottman Hall, 3:30 PM.
Attend, write a summary and earn 10 Extra Credit points. If you can't attend, we
will make a video available to you.

11 20 4/2/15 Insect Defense Compounds and Their Manipulation by Humans

Readings, week 11 assigned 3/27, due 4/3
Exploratory Exercise 9 assigned 3/25, due 4/1

12 21 4/7/15 Insect Cuisine—You eat what?????
Role of Insects in Feeding Humans around the Globe

12 22 4/9/15 Insects in Medicine—Ancient to Modern Practices

Readings, week 12 assigned 4/3, due 4/10
Exploratory Exercise 10 assigned 4/1, due 4/8

13 23 4/14/15 Of Venoms, Poisons and Insect-Based Cures: Bugs as
Drugs & Aphrodisiacs

13 24 4/16/15 How Insects Changed Science—Pasteur and the Germ
Theory of Disease

Readings Week 13 assigned 4/10, due 4/17
Exploratory Exercise 11 assigned 4/8, due 4/15

14 25 4/21/15 T.H. Morgan and the role of insects
in creating the Modern Synthesis

14 26 4/23/15 Silk, its historical significance and biochemistry

Readings week 14 assigned 4/17, due 4/24
Exploratory Exercise 12 assigned 4/15, due 4/22

15 27 4/28/15 Pollination Services: Ecological & Economic Benefits

Final Exam: May 1 12:00-1:45

Text

At present, there is no published text book that offers adequate coverage of the diverse topics found in this course. As a consequence, I am supplementing the course with a reading list which is detailed below. The purpose of this reading is to back up and expand upon what you're learning from the lectures. The readings will also provide the basis for discussion in recitation sections. All the readings will be available by the second week of class but they are assigned by week for your convenience in organizing your work schedule. Please read or review the material during the week it is assigned. Questions from the reading may appear on weekly quizzes.

Course Evaluation and Assessment

Your grade in this course will be determined from the following:

Assessment of Lecture Content:

1. Two Hour Exams—100 points each
2. **Comprehensive Final**—200 points

Assessment of Reading and Exploratory Exercise Content:

1. **12 Weekly Exploratory Exercises—120 points**

These will be filled out during the week assigned and turned in electronically by the beginning of your next recitation. All of the exercises are worth 10 points.

2. **Discussion of Readings—70 points.** Each week, we ask you to read materials posted on Carmen. We expect that you will have read them by the time that you attend recitation each week. These readings will serve as the basis for in-class discussions and you will be graded on your participation in those discussions. You can earn 5 points each week that will be graded depending on quality. This is equivalent to 70 points over the course of the semester. We are fully aware that some of you are not comfortable with talking in class, and we will give credit for improvement. A discussion rubric has been placed in the syllabus section of Carmen so that you can learn more fully how we will grade this component of the course.

3. **Insects in the News:** You may earn 2 points of **extra credit** (up to 20 points per student) for each insect-related article or story you send directly to Dr. Fisher via email prior to **Friday, April 3 by 5 PM**. She may use the articles to explore how effectively the scientific method is reflected in the popular press and how insects influence our understanding of contemporary society. To earn 2 points for each article, please write a one paragraph summary of the content and email the article and the paragraph directly to Dr. Fisher.

3. Attend an optional and summarize the content of the **Jeffrey Lockwood Seminar on 4/1/15** for 10 extra credit points. The lecture will take place in 236 Kottman Hall at 3:30 PM. If you can't attend the lecture, we will make a tape available to you.

Total Possible Points in Course: 590

Grading Scale:

93-100	A
90-92	A-
87-89	B+
83-86	B
80-83	B
77-79	C+
73-76	C
70-73	C-
67-69	D+
60-66	D

Exploratory Exercise Schedule

You will be completing weekly on-line exercises of which there are 12. You will be doing an activity or exercise every week. These activities vary from watching videos to performing dry labs to performing simulations to engaging in purely creative activities like writing a myth. Each week a specific Exploratory Exercise will be assigned on Wednesday. You will be handing something in for each week. In each case, the written materials you will be handing in are due on Wednesday of the following week by 5:00 PM. **PLEASE DEPOSIT YOUR WRITTEN RESPONSES ELECTRONICALLY INTO A DROPBOX THAT HAS BEEN SET UP IN CARMEN FOR THE EXPLORATORY EXERCISES EACH WEEK.** The point value of these assignments is 10 points. We will also use the exploratory section to make sure that you learning material specified in the Learning Outcomes for this course. Below you will find a general description of what you'll be doing each week. Additional details will be provided for you each week in a document written for each exercise which will be posted on Carmen.

1 (Assigned 1/21/15, Due 1/28/15) Students will view the videos "Know the Difference: Hypothesis vs. Theory", and "Know the Difference: Science vs. Religion" which are available on YouTube, discuss evidence-based ways of knowing and categorize statements of different types.

2 (Assigned 1/28/15, Due 2/4/15)—Create an insect myth to explain some biological principle. Students will examine insect photos, look up sources on line that discuss the ecology and feeding habits of an insect of their choosing and write an original myth to explain some aspect of the insect's habits.

3 (Assigned 2/4/15, Due 2/11/15) What can you eat---according to divine texts and is there a biological basis? Students will compare three passages in the Bible, Qu'ran and Torah which describe dietary laws and analyze which foods are permitted in which religions.

4 (Assigned 2/11/15, Due 2/18/15) Insects in Music—students will examine the appearance of insects in music of different types. Students will select a piece of music and analyze the piece for its entomological significance, the composer and his work.

5 (Assigned 2/18/15, Due 2/25/15) Fear of insects, a cinematic experience—students will watch an insect-themed movie. Then, they will evaluate the accuracy of how insects are depicted in horror films and examine the reasons that people fear insects.

6 (Assigned 2/25/15, Due 3/4/15) Insects and human disease—Students will read about methods for tracking the spread of pandemic diseases. Students will make predictions about the spread of insect-vectorized diseases.

7 (Assigned 3/4/15, Due 3/11/15)—Students will understand the specific factors relevant to the spread of insect-vectorized pandemic disease by playing the computer game Pandemic. Students will run and report the results of multiple scenarios in which the disease factors are altered.

8 (Assigned 3/11/15, Due 3/25/15) The Black Death. Students will watch the award winning video, The Black Death (produced by the History Channel) on OSU's Secured Media Library. Students will then be asked to answer questions and analyze a common claim about the plague and do internet research to reach a conclusion about its validity.

9 (Assigned 3/25/15, Due 4/1/15) Silent Spring—the movie and the book.

Understanding environmental toxicology and social impact of insecticides. Dry lab: Altering the speed with which resistance to insecticides occurs.

10 (Assigned 4/1/15, Due 4/8/15) Insects and Human nutrition—a comparative study. Students will gather information about the dietary habits of entomophagous cultures in the contemporary world, calculate the adequacy of these diets to meet the FDA's requirements for an adequate diet and compare the results to their own eating habits which each student will be asked to track for a week.

11 (Assigned 4/8/15, Due 4/15/15) Students will perform a dry lab based on Thomas Hunt Morgan's experiments with *Drosophila melanogaster* to reveal the genetics of mutation in the fruit fly.

12 (Assigned 4/15/15, Due 4/22/15) Pollination Ecology—What would happen in a world without pollinators? Students will perform a thought experiment in which they identify factors affecting the survival of pollinators and make predictions based on different levels of survival.

Absences: If you are too ill to take an exam, please contact your TA or Dr. Fisher prior to missing the exam. You must be seen by and receive written documentation from a professional health care practitioner documenting your inability to take the exam. Other serious personal problems will be considered, in advance, on an individual basis. In all instances, documentation supporting the excused absence will be required.

Academic Misconduct: OSU has a strict code of academic that requires us to report any and all cases of suspected misconduct (e.g. cheating on an examination, plagiarism in written assignments WHICH INCLUDES COPYING ANSWERS FROM ANOTHER STUDENT, using an examination proxy, failure to follow course policies etc.) to the OSU Committee on Academic Misconduct for adjudication. “It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term ‘academic misconduct’ includes all forms of students’ academic misconduct wherever committed: illustrated by, but not limited to, cases of plagiarism and dishonest practices in connections with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).”

PLEASE NOTE: THE WORK YOU DO ON EXPLORATORY EXERCISES MUST BE YOUR OWN. STUDENTS WHO SUBMIT IDENTICAL ANSWERS FOR EXPLORATORY EXERCISES WILL RECEIVE A ZERO FOR THE ASSIGNMENT AND, CONSISTENT WITH UNIVERSITY RULES, WILL BE REFERRED TO THE COMMITTEE ON ACADEMIC MISCONDUCT.

Accommodation of Special Needs: Students with disabilities that have been certified by the Office of Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Ave; telephone: 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

Sexual Harassment: OSU considers sexual harassment offenses to be unacceptable behaviors that erode the quality of the learning environment. Please report any concerns about questionable behavior to Dr. Fisher.

Reading List for Course

All readings will be posted for you on Carmen.

Week 1

Excerpts from Berenbaum, M.R. (1995). *Bugs in the System*. Perseus Books. Cambridge, MA. 377 pages.

Chapter 2: Physiology, pp 12-37.

Chapter 3: Behavior, pp. 38-50.

Week 2

Excerpts from: Kritsky, G. and R. Cherry (2000). *Insect Mythology*. Writers Club Press, Lincoln, NE, 137 pp.

Chapter 1: Insects as Symbols, pp.3-21
Insects as Examples of Parallel Mythology, pp. 22-34

Week 3

Hogue, C.L. Cultural Entomology. *Ann Rev. Entomol.* 32: 181-199.

Cherry, R. (2011). Insects and Death. *American Entomologist* 57: 82-85.

Excerpts from Lesser, F. C. (1799). *Insectotheology: Or a Demonstration of the Being and Economy of God, from a Consideration of the Structure and Economy of Insects*. American Tract Society, Nassau Street, New York

Book 1, Chapter 1: Of the Creation and Generation of Insects, pp. 27-34.

Excerpts from Paley, William (1801). *Natural Theology*

Chapter 1: State of the Argument, pp. 1-13.
Chapter 2: State of the Argument Continued, pp. 14-26.
Chapter 19: Insects, pp. 211-226.

Week 4

Fleischman, P. (1988). *Joyful Noise—Poems for Two Voices*. Harper & Row, Pub.

Dethier, V.G. (1993). *Crickets and Katydid, Concerts and Solos*. Harvard Univ. Press, Cambridge, MA.

Week 5

Excerpts from Lockwood, J. A. (2013). *The Infested Mind: Why Humans Fear, Loathe and Love Insects*. Cambridge University Press, New York, 230 pages.

Prologue: pp. xvii-xxi
Chapter 1: The Nature of Fear ---And Fear of Nature, pp. 1-19.
Chapter 2: Entomophobia: A Product of Our Genes?, pp. 20-34.

Cloyd, R.A. (2013). Secrets of the “Big Bugs”: Special Effects in 1950s Science Fiction Movies. *American Entomologist*, 00. 203-207.

Week 6

Excerpts from : Lehane, M. (2005). *The Biology of Blood-Sucking Insects*. Cambridge University Press, Cambridge, UK. 312 pages.

Chapter 1, The importance of blood-sucking insects, pp. 1-6

Chapter 2, The evolution of the blood-sucking habit, pp. 7-14

Week 7

The onset of the Black Death. *Medieval Sourcebook: Boccaccio: The Decameron—Introduction*, 4 pages.

The Decameron, Wikipedia http://en.wikipedia.org/wiki/The_Decameron, 5 pages

Week 8

Excerpts from Stewart, A. (2011). *Wicked Bugs; The Louse that Conquered Napoleon's Army and Other Diabolical Insects*. Algonquin Books of Chapel Hill, Chapel Hill, NC. 272 pages.

Introduction: We are seriously outnumbered ,pp.XI-XIII

African Bat Bug, pp. 1-3.

Bugs of War, pp. 20-26

What's Eating You?, pp. 222-231.

Week 9

Miller, G.L. (1997). *Historical Natural History: Insects and the Civil War*. *American Entomologist*. 43: 227-245.

Week 10

Excerpts from: Marco, G.J., R.M. Hollingworth and W. Durham (1987). *Silent Spring Revisited*, American Chemical Society, Washington, D.C.

Chapters

1. *Rachel Carson : Her Vision and Her Legacy*, pp. 3-9

3. *The Science and Politics of Pesticides*, pp. 15-22.

8. *Analytical Chemistry of Pesticides: Evolution and Impact*, pp. 127-138.

Week 11

Excerpts from: Lockwood, J.A., (2008). *Six-Legged Soldiers: Using Insects as Weapons of War*. Oxford Univ. Press, London, 400 pp.

Bee Bombs and Wasp Warheads, pp. 9-25.
Entomological Evil, pp. 95-107.
Insect Cyborg and Roboflies, pp. 287-297.

Week 12

Sherman, R.A., M.J.R. Hall, and S. Thomas (2000). Medicinal Maggots: An Ancient Remedy for Some Contemporary Afflictions. *Ann. Rev. Entomol.* 45: 55-81.

Kenyon, G. (2002). Insects Boost Immune System. *BBC News*, 2/0.02.

Cherniak, P. (2010). Bugs as Drugs, Part I: insects. *The "New" Alternative Medicine. Altern. Med. Rev.* 15 (2): 124-135.

Week 13

Lewis, E.B. (1998). Thomas Hunt Morgan and His Legacy. http://nobelprize.org/nobel_prizes/medicine/articles/lewis/.

Allen, D.C. (1999). Insect-Produced Silk: from textiles to tents. *The New York Forest Owner*, 37: 6.

Week 14

Berenbaum, M.R., (2007). Colony Collapse Disorder and Pollinator Decline. Statement of M.R. Berenbaum, Professor and Head, Department of Entomology, University of Illinois before the Subcommittee on Horticulture and Organic Agriculture, U.S. House of representatives, 3/29/07.