

University of Wisconsin-Madison

ENTOM/ ENVIR ST 201: INSECTS AND HUMAN CULTURE

General Course Information

Course Dates: 22 January to 2 May 2025

Credits and Credit Requirements: 3 credits

Course Webpage: <https://canvas.wisc.edu/courses/439500/>

Course Designations and Attributes: Counts toward the Natural Sciences requirement, Liberal Arts and Science credit (L&S), and the International Studies requirement (CALs). Attributes include Sustainability and Honors.

Course Description: Importance of insects in the environment, emphasizing beneficial insects, disease carriers, and agricultural pests that interfere with the food supply. Environmental problems due to insect control agents.

Meeting Time: Either Monday, Wednesday, or Friday 12:05-12:55

Location: 184 Russell Labs

Instructional Modality: Hybrid (online and in-person)

Credit hours follow the traditional Carnegie definition: 3 hours of content, anticipate 3 hours of work outside of class time/posted lectures per week per credit.

Regular and Substantive Student-Instructor Interaction: Regular and substantive student-instructor interaction in this course, as defined by the US Department of Education (within [34 C.F.R. §600.2](#)), will include direct instruction, providing feedback on student work, providing information about course content, and facilitating discussion of course content.

Other Course Information

Instructors: Sean Schoville and Russell Groves

TA: Ann Marsh

E-mail contacts: sean.schoville@wisc.edu; rgroves@wisc.edu; amarsh3@wisc.edu

Phone: 608-262-2956

Office: 637 Russell Labs (**Sean Schoville**) and 237 Russell Labs (**Russell Groves**)

Office hours: All office hours are by appointment. Please understand that we want to meet with you, but we have many students with varying schedules, so confining office hours to a couple hours a week doesn't work for everyone. Instead, simply **send an email to Ann, Russ, and Sean (cc us so we are all in the loop)** with a time window when you are available, and we will figure out a time that is mutually acceptable.

This is a **hybrid** ('blended') class. Lecture content is accessible on Canvas and in-class time is designed for group activities. If you have questions about general academic issues (e.g., course content, deadlines, etc.), please post those in the discussion section labeled "Class Questions". Please remember that personal inquiries should be sent by email.

Class Policy Regarding Illness and Missed Assignments

We have set up the course allowing for multiple dropped assignments and flexible submission times to accommodate you if you become ill or have another emergency. **We will not provide additional exceptions**, as this leads to inequities among students. If you miss class due to illness or another life event, it is very important that you reach out to us as soon as possible. We will do everything we can to work with you to complete your course work. Please monitor yourself for symptoms of illness and get medical care from UW Health. For the COVID-19 virus, please refer to [campus resources and policies](#).

Course Objectives, Learning Outcomes and Grading

ENTON/ENVIR ST 201 is designed for non-majors who need credits in a science course or want to expand their biological horizons. Throughout the course of the semester, **students in this course will:**

- **Identify and summarize biological concepts through knowledge of insects.**
- **Integrate knowledge of human culture and international issues with entomological science.**
- **Analyze biological/cultural concepts and compose creative, well-composed arguments.**
- **Demonstrate critical thinking and comparative perspectives about biological science/cultural issues.**

Course Grading

Your grade will be based on your **performance and progress to reach these learning outcomes** in four areas of assessment.

	Biological Concepts	International Issues & Culture	Conceptual Ability	Critical Thinking
1. Observation of insect growth (20%)	Recall course knowledge and vocabulary		Demonstrate scientific and/or creative ability	Summarize and integrate knowledge to demonstrate scientific insights
2. Twelve quizzes (15%)	Apply knowledge of biological concepts	Apply knowledge of international/cultural concepts		Distinguish factual and non-factual scientific concepts
3. Five short conceptual responses (35%)	Evaluate knowledge and debate concepts related to scientific issues	Differentiate international/cultural perceptions of beliefs, scientific ideas, and societal practices	Generate creative, well-composed arguments	Produce logical and defensible conceptual narratives
4. Insect microdocumentary (20%)	Recall and identify biological concepts		Demonstrate scientific and/or creative ability	Summarize and integrate knowledge to demonstrate scientific insights
5. Class participation in group discussions (10%)	Recall and identify biological concepts	Recall and identify international/cultural concepts	Compose concise creative answers to a variety of questions	Summarize and integrate knowledge to demonstrate scientific insights

Grading will be based on a straight percentage basis:

100 - 95.0 = A (Excellent)
 94.9 - 87.5 = AB (Very Good)
 87.4 - 82.5 = B (Good)
 82.4 - 78.5 = BC (Average)
 78.4 - 70 = C (Fair)
 69.9 - 60 = D (Poor)
 Below 60 = F (Failure)

Details on Assignments

1. Observation of Insect Growth (20%). Due date: midnight 27 April 2025.

Consult the rubric at the end of syllabus or on Canvas.

OBJECTIVE: The objective of this exercise is to examine, in detail, an insect's life cycle. You will have the chance to see an organism shed its skeleton while at the same time form a new one. You will see a beating heart. You will observe the massive amount of food it takes to keep our insect alive. We hope that you can then begin to appreciate why humans and insects are inextricably linked, sometimes in direct competition for resources. You will develop scientific observational skills and critical thinking skills as an outcome of this activity.

Part 1 (Personal Observation Log): You will be expected to document your growing insect **EVERY DAY** (including weekends!) to observe its changes and keep a **DATED** log of events. To receive full credit for this exercise, you will need to have a daily written observation and images of the growing insect captured in your log. However, your log is more than just a series of notes and pictures. Look closely at the insect and make observations. As questions come to mind, put them down on that day's observation and see if you can answer them using on-line resources. **Integrate the knowledge you obtain in class as you go along - we want to see your observations improving with time!** You will be required to turn in your personal log when you have finished the observations. We strongly advise you to make a back-up of your records. Computers can and do crash, especially at finals time.

Part 2 (Group Observation Log): **You are required to compare your notes with your group once a week.** These notes must be placed as a separate section in your final journal submission and should catalogue each group member's summary of what they observed each week. Each member of the group will need to turn in the group notes as part of their individual log.

Recommended Format:

1. Cover sheet with your name and group members' names.
2. Table of Contents, with a legend indicating highlighted scientific vocabulary.
3. "Personal daily observation log" with associated images (in focus)
4. Weekly research questions that require outside research with sources
5. "Group log", which is a record of rearing partners observations (minimum of weekly summary reports)
6. A conclusion section (2-4 pages in length). This will synthesize your perspective on the project (about *Manduca*, science, etc) in 1-2 paragraphs. Additionally, you will demonstrate critical thinking through research on additional topics related to *Manduca*. Using a series (2-3) of figures/tables from published papers, you will interpret and explain these to the reader and connect them to the *Manduca* project.

Some suggested content for a daily log (remember, excellence in this assignment exceeds our expectations):

Drawings (accurate) or photos (in focus)

Observations on the stage of your insect noting:

Color changes, Size changes, Molting behaviors, Movement and Behavior, Diet Consumption and Waste Production

Consider recording temperature and body size (length and width) to plot it over time.

Submission Format: To complete your log, you will need to **upload it as a pdf**. If you have high quality images, you will want to choose file compression so that it reduces the file size (if you are using Microsoft Word, use the export function to see the options for reducing file size).

2. Quizzes (15%). Due dates: Each week by midnight Sunday.

There will be 13 graded quizzes during the semester, each graded on a 20-point scale (5 questions worth 4 points each). There are no makeup quizzes, but we do drop the two lowest quizzes.

OBJECTIVE: To assess your biological literacy and knowledge of human culture. You will need to know some of the key concepts that are discussed in our lectures and to think critically. Quizzes are based on the lecture material provided with this course. To receive the best grade possible, take the quiz after you have watched the lectures in the modules for that week. Our first quiz, a practice quiz, is mandatory and covers course subject matter (but is not graded). You must pass this quiz to remain enrolled in the class during the second week. Starting in the second week, there will be a quiz covering lecture content of that entire week. Each quiz must be completed by the Sunday of each week.

3. Short conceptual responses (35%). Due Dates:

- **First conceptual response (MANDATORY) is due at midnight on Sunday, 09 February 2025.**
- **Three (3) responses must be submitted by midnight 16 March 2025.**
- **All 5 responses must be submitted by midnight 13 March 2025.**

RESPONSES ARE ONLY ACCEPTED IF TURNED IN ON CANVAS BY MIDNIGHT OF THE DEADLINE.

OBJECTIVE: To enhance your critical thinking skills, while advancing your literacy in biological science.

The broad range of topics is intended to gauge your understanding of key concepts by engaging your curiosity and creativity, providing everyone with multiple opportunities to become interested in course material. If a topic interests you, then prepare **a conceptual response in four to five slides (Microsoft PowerPoint, Google Slides, or Adobe Presentation Maker are examples of software that can be used to prepare your slides). Save these to a pdf to upload them.**

The conceptual response should primarily use graphics to convey your response (text should provide a minor, supporting role). The conceptual flowchart is an integral component of this assignment. Your response should address significant concepts and include scientific facts

relevant to the chosen topic. As this is a science class, all responses should integrate scientific information with citations (the full reference goes at the end in the Bibliography). Here is a suggested format:

- 1) Slide 1 contains: Title, your name, and prompt number. It should introduce the topic.
- 2) Slide 2 contains: key points about your argument with supporting factual information. It should include use of an original flow chart to convey information.
- 3) Slide 3 contains: a set of concluding remarks.
- 4) Slide 4 contains: a bibliography.

Grading: Responses should be carefully edited and will be graded on a 100-point scale. **Your grade will be based on FIVE different conceptual responses.** Set prompts will be available for one week, and you can skip those topics if you want, but you can't return to a topic that was issued for previous weeks and is closed. If you do not like your scores, please write additional responses. Only the 5 highest scores will be used for your grade in the course. For example, you may have turned in 8 responses, and while all will be graded, only your 5 highest scores will be used for computing grades.

Rules for late assignments.

Due Sundays at midnight Central Standard Time. After that time, the response will not be accepted. You must check in with Canvas at least once a week. Look at your grades to see if your scores are recorded and are correct. If a grade is missing, you must inform us promptly.

Rules for accepted content.

Plagiarism of any sort, whether from the web or another student, is unacceptable; there will be academic repercussions. If we suspect your work is not your own, we will not count these responses as completed work. Please see our policy on artificial intelligence tools below.

Crafting a successful response: STRIVE FOR UNIQUENESS, CLARITY AND SIMPLICITY

Most professional communicators develop an outline to organize their thoughts and ensure what they write has a logical structure. It is also important to address a specific audience. For this class, pretend you are presenting to a person who has a college background in a non-scientific area. However, you are responding to scientific topics. **Science communication involves statements of fact, with citations to support arguments. Even an opinion piece or a perspective must include research to provide factual statements.**

Recommended steps:

Do research and read about the topic, noting important sources for the information you obtain. Think about the results of your research and organize your ideas into a coherent sequence of information. Make sure to focus on major ideas which illustrate your thesis. Turn your ideas into graphics. Provide visual graphics to deliver the narration (use flow charts, schematics, process-maps, or carefully selected images that convey meaning). Prepare your slides, but practice going through them so you can understand how an audience would interpret them.

The topics are open-ended and hopefully thought-provoking. We are looking for creativity, logic, and above all, progress in conceptual thinking. The campus Writing Center has great resources if you need help. You can discuss some of the topics when meeting in groups, but your work must be expressed in your own words. Cite your sources.

Grading conceptual work is difficult and is often seen as subjective. **Our rubric lists the important features of a strong response, and you should consult it to evaluate your work.**

Remember, perfect scores mean you have no room for improvement, and this is a very high bar that you shouldn't expect to receive without significant effort

4. Microdocumentary (20%) Due date: Sunday, 06 April 2025, midnight

Consult the rubric at the end of syllabus or on Canvas. Late entries will NOT be accepted.

OBJECTIVE: How are scientific observations made? How do entomologists learn about insects and their role in nature? In this assignment, your job is to help advance entomological research by observing and documenting an aspect of insect natural history by creating an original Microdocumentary. This is your chance to conduct observational science on an insect and share your scientific interpretations. What are their challenges? Their goals? Their behaviors? What are the solutions they use to survive? Scientific observations often involve patience, close attention, trial & error, and careful analysis.

Utilizing the video recording capability of your Smartphone, digital camera, or other video recording device if you wish, your task is to create a Microdocumentary. Your mini documentary should consist of edited video footage, voice-over narration (VO), and a range of visualization strategies such as panning, zooming, and still photography. Your documentary should include your scientific interpretation of the observations you made – based on additional research and a rationale for the observed insect behavior. **Let me state that again, part of your task is to understand what you observe.** Figure out as much as possible on your own, using research on the web and in scholarly literature. Choose interesting insects (not just the first organism you find immediately outside your home), as your engagement will improve your micro-doc. **You cannot choose *Manduca sexta* or feeder insects from pet stores as your subject.**

This can be a **challenging task**, so plan time to make observations over multiple days (or weeks!) for this project. Make multiple recordings, take multiple pictures. Combine your best video and images in a way that demonstrates and exemplifies your observations.

Microdocumentary Format and Grading (see rubric): Prepare a **three-to-four-minute, edited video**. The video cannot be more than 5 minutes. **You must choose an insect and identify it to order using its scientific name.** The **video should include a title screen, narration, and textual aids** to help your audience understand the observations, **and at least three outside sources with credit** (sources of information) listed at the end of the documentary. Observations should be edited, exhibiting quality and craftsmanship in conveying information. We want you to have fun, but treat the assignment seriously.

Part of your grade will be based on the visual quality of your documentary and its appeal to an audience. I suggest showing a draft of your microdoc to another person or two, so that they can give you feedback.

Suggested Free Video-Editing Software:

- iMovie, PowerPoint, Windows Movie Maker

If you are unfamiliar with video editing software, as a UW-Madison student you have free access to [Lynda.com](https://www.lynda.com). Lynda.com offers online training on a wide variety of software - including some of the software listed above (see [iMovie Essential Training](#))

Submitting your Assignment:

Read this carefully. To submit your assignment, you will upload it to [Kaltura](#) to acquire a URL. **You then submit the URL on canvas.** Please familiarize yourself with the file [formats accepted by Kaltura](#), and the process by which one [uploads files to Kaltura](#). **You must publish your video as "Unlisted"**. If you do not, we will not be able to view it. It is your responsibility to make sure you have uploaded and published your video properly. Send the URL to a friend to make sure they can see it!

5. Class Participation in group discussions (10%). Due dates:

- **The introduction selfie is due midnight on Friday, 31 January 2025.**
- **Each group discussion assignment is due Friday by midnight.**

OBJECTIVE: To assess your knowledge gains and ensure you are participating in the course.

We retain more and are more likely to gain new insights if we actively engage in learning. Earning your participation grade will require: **meeting with a small group in class once a week** 1) **turning in a one paragraph introduction of yourself including: which group you will be participating in, along with an up-to-date selfie picture** (20 points), 2) **completing 13 small group discussion assignments** to assess your attendance and comprehension of course material (20 points each; the two lowest grades among the assignments will be dropped).

You will be required to participate in a group of three to four people that meet once a week in class. You will be able to form your own group in the first week of class, after that, random groups will be assigned, and everyone must be in a group by midnight on Saturday of the second week of classes.

A note about grading group activities: You are expected to participate in person. The instructors will be checking your attendance. Because unexpected circumstances arise throughout the semester and this is a large class, we are allowing two dropped scores in this grading bracket.

Participation assignments will be available weekly and will be due (online through CANVAS) by midnight on Friday of that week. Each participation assignment is worth 20 points, but the two lowest grades will be dropped.

Optional: Honors Assignment

For those choosing an honors designation, you will compose a 2–3-page response that you will place before the conclusion section as an additional component to your *Manduca* project. This

will focus on the **internal process of metamorphosis during the pupal stage** and will **elaborate on the genetic, cellular, and tissue changes that occur internally**. Using two or more figures from published papers, interpret and explain the figures. You should also describe **how imaging technology** was used to discover genetic, cellular, and tissue changes. Conduct outside reading to support your arguments and consider using the following papers. Note, detailed analyses may not be available for *Manduca sexta* but can be found for other insects.

Please follow the same formatting guidelines as for a *Manduca* journal entry, label it as your Honors Assignment, and turn it in at the end of your observation log.

Suggested References

Hall, M.J., Simonsen, T.J. and Martín-Vega, D., 2017. The ‘dance’ of life: visualizing metamorphosis during pupation in the blow fly *Calliphora vicina* by X-ray video imaging and micro-computed tomography. *Royal Society Open Science*, 4(1), p.160699.

Hall, M.J. and Martín-Vega, D., 2019. Visualization of insect metamorphosis. *Philosophical Transactions of the Royal Society B*, 374(1783), p.20190071.

Kaur, Ayesa. 2013. Metamorphic Development Of *Manduca Sexta*: An In Vivo Integrative Approach To Studying Whole Animal Physiology. Ph.D. Dissertation, Cornell University. <https://hdl.handle.net/1813/34198>

Lowe, T., Garwood, R.J., Simonsen, T.J., Bradley, R.S. and Withers, P.J., 2013. Metamorphosis revealed: time-lapse three-dimensional imaging inside a living chrysalis. *Journal of the Royal Society Interface*, 10(84), p.20130304.

Rolff, J., P.R. Johnston P.R. and Reynolds, S. 2019. Complete metamorphosis of insects. *Phil. Trans. R. Soc. B* 374, p.20190063. <http://doi.org/10.1098/rstb.2019.0063>

We are constantly working on new material, so this schedule may change during the semester.

Week	Online Lecture Topics	In Class Topic	Biological Concepts	International Issues and Cultural Concepts	Assessments, Milestones and Major assignments
Week 1: January 20-24, 2025	Why Study Insects?	Getting Started in ENT201. Small Group Discussion 1: Culture, Insects & Food	What are insects	Insects play an important role in cultures throughout the world	Course orientation practice quiz (online) Small group discussion 1 (Wed/Fri sections only)
Week 2: January 27-31, 2025	Insect Diversity, Biological Classification, and relationships	Small Group Discussion 2: Getting started on the Manduca Observation Journal	How many species and how do we know	Prevalence of agriculture and disease risk around the world	Selfie assignment Due 13 September Quiz 1 Small group discussion 2
Week 3: February 03-07, 2025	Factors in Evolution, Tour of the Insect Body	Small Group Discussion 3: What are biodiversity hotspots?	Evolution, natural selection, and species decline; External anatomy	Cultural issues concerning evolution	Conceptual Response 1.1 Due 22 September Quiz 2 Small group discussion 3
Week 4: February 10-14, 2025	Courtship and Mating; Growth and development	Small Group Discussion 4: Complexity of Courtship and Mating Behavior	Complexity of courtship behaviors; Life cycle and physiology		Quiz 3 Small group discussion 4
Week 5: February 17-21, 2025	Insects on the inside; Insect perception	Small Group Discussion 5: Forensic Entomology	Internal anatomy; What do insects perceive? Temperature, insect life stages and population		Conceptual Responses 2.1 and 2.2 Quiz 4 Small group discussion 5

		Activity	ecology		
Week 6: February 24-28, 2025	Flight; Migration and Navigation	Small Group Discussion 6: Mimicry	Flight mechanics and diversity; Navigation and long-distance dispersal;	International culture and navigation; Difference in international practices of criminal investigation	Conceptual Responses 3.1 and 3.2 Quiz 5 Small group discussion 6
Week 7: March 03-07, 2025	Social Insects; Pollination by Insects, Honey Bees and CCD	Small Group Discussion 7: Manduca Project: Preparing for pupation	Eusociality; Insect roles in pollination, how plants use flowers to attract pollinators	Great human migrations	Conceptual Responses 4.1 and 4.2 Quiz 6 Small group discussion 7
Week 8: March 10-14, 2025	Agricultural Entomology	Small Group Discussion 8: Agricultural Entomology	Principle of insect pest suppression; The relationship between economic injury threshold, economic injury	Invasive insects and agricultural production around the world, historical role of entomology	Three conceptual responses due 16 March at midnight Conceptual Responses 5.1 and 5.2 Quiz 7 Small group discussion 8
Week 9: March 17-21, 2025	Agricultural Entomology	Small Group Discussion 9: Migration	Ways of insect suppression	How choices of insect suppression affect food supply	Conceptual Responses 6.1 and 6.2 Quiz 8 Small group discussion 9
March 24-28, 2025 SPRING BREAK					

Week 10: March 31-April 04, 2025	Insect services to humanity Mimicry;	Small Group Discussion 10: Factors Influencing Pest Management	Vital ecosystem services (pest control disease control, pollination)	Human concepts of valuing nature	Microdocumentary 06 April at midnight Conceptual Responses 7.1 and 7.2 Quiz 9 Small group discussion 10
Week 11: April 07-11, 2025	Auditory and Chemical Communication	Small Group Discussion 11: Polishing Up The Manduca Journal	Things simply may not appear as they seem Mimicry types and diverse strategies		All 5 conceptual responses submitted 13 April at midnight. Conceptual Responses 8.1 and 8.2 Quiz 10 Small group discussion 11
Week 12: April 14-18, 2025	Medical Entomology Part 1: Annoying Insects, Endoparasites; Metazoan Pathogens, Chagas and other Protozoan Pathogens	Small Group Discussion 12: Entomology and Global Health	Disease agents and diversity of ways insects carry disease; Ways that insects use plant defenses to help them	Disease, global population growth and impact on economics; public health and environment	Quiz 11 Small group discussion 12
Week 13: April 21-25, 2025	Medical Entomology Part 2: Malaria	Small Group Discussion: Lice, Disease, and Coevolution	Malaria and mosquito life cycles; insects can live almost anywhere	Impacts on people in tropical Africa and America, history of malaria	Manduca adult due 25 April at 1pm Manduca Journal due 27 April at midnight Quiz 12 Small group discussion 13
Week 14: April 28-May 02, 2025	Medical Entomology Part 3: Lyme, plague, lice disease & coevolution; Insect	Small Group Discussion 13: Monday section only: Culture,	Biology of Lyme, plague and their insect hosts; Biology of lice transmission, evolution and	Impacts on people in tropical Africa and America, history of malaria	Quiz 13 Small group discussion 1 (Mon section only)

borne viruses

Insects & Food,
**The Final
Countdown**

arboviruses

Week 15:
December 09-11,
2024

**No discussion
section**

List of Conceptual Response Topics

- 1.1 Recall one of your most memorable encounters with insects and write a short conceptual response on the subject (approximately 4 slides).
- 2.1 Insects have often been used as symbols in human culture, for spiritual or secular purposes (e.g. state insects). Using an example or two, describe the meaning and significance of a particular insect as a cultural symbol.
- 2.2 Many people have an irrational fear of insects (they feel they are disgusting or harmful, when most of them are not). What would you say to convince them to think differently? Integrate your knowledge of different cultures to answer this question.
- 3.1 Advances in technology have made it possible to "revive" long extinct species, such as the woolly mammoth. Develop a conceptual response to this idea, concerning its merits or its risks.
- 3.2 The California condor is one of the largest and most endangered species of bird on the planet. In the early 1980's, all 23 known California condors were brought to the San Diego Zoo's Wild Animal Park for a captive breeding program. Conservationists treated the condors with a pesticide to kill the California condor louse, an avid chewing louse that could only exist on the California condor. Consequently, the louse was driven to extinction by human intervention. This louse did not appear to harm the condor in any way. Were the correct ethical choices made in driving this louse to extinction?
- 4.1 Do insects sleep? Do insects feel? Can insects learn (remember)? Discuss whether you think insects are sentient.
- 4.2 Insect lifecycles can range from a few days (e.g. aphids) to as much as several years (e.g. cicadas) just to complete a single generation. Explain the advantages and disadvantages for this variation in life history among insects and if one of these would be more beneficial under a changing climate.
- 5.1 From the list below, select an entomologist and describe their accomplishments in science and society.
- 5.2 Insects have often featured in art (painting, film, literature, and music). Using a piece of artwork familiar to you, describe the meaning or values assigned by the artist to the insect.
- 6.1 Why are insects the subject of study for advanced robotics? What are the important insect features that provide performance advantages to the next generation of robots.
- 6.2 Very few countries support scientific research. Among the major economies, Japan has a strong program in basic research, while Europe has largely technocratic programs (research must lead to social benefits). Given the immense cost of research, and the immediate lack of any benefit, should your society support basic research on poorly studied insects?
- 7.1 Human and animal microbial associates are quickly being realized as very important in terms of overall health and even immunity. Do insects possess microbial associates, and if so, what important functions do they perform in their association(s) with insects?
- 7.2 Insects have been used in different cultures for medicinal therapies. Using example(s), describe what is known or unknown about the utility of insects as medicine.

8.1 Pesticide contaminants in surface and subsurface (ground) waters of Wisconsin and the upper Midwest are becoming widespread in their occurrence. What are the public health and environmental consequences of these contaminants, and what solutions could we bring to agriculture to lessen or curtail this developing problem?

8.2 Imagine a world without insect pollinators. What would happen to human society and how would we cope?

How to Succeed in this Course

Your effort is essential to success in this course. You'll need to consistently put time into your major assignments (do not procrastinate!). Our expectations for the amount of time are modest, but we will grade assignments based on the quality of your effort. Get into a pattern of doing a little bit of work each day and every day, and be curious about what you are learning. You are also expected to show up and participate. Not doing so will hurt your grade.

Here are some resource links to important campus services that can support you during this course:

- [*University Health Services*](#)
- [*Undergraduate Academic Advising and Career Services*](#)
- [*Office of the Registrar*](#)
- [*Office of Student Financial Aid*](#)
- [*Dean of Students Office*](#)

Use of Artificial Intelligence in this Course

You are welcome to use artificial intelligence (AI) tools and applications in this class if they support the learning objectives of this course. Please be aware, **completing assignments entails the responsibility that it represents your original work**. You are responsible for understanding the content of each assignment, and for the factual accuracy of the information you submit, whether or not it includes an AI query. Furthermore, **your use of AI tools must be documented and cited** to conform to this course's expectations. Many AIs will generate content, but if you expect a passing grade, expect to make your work creative and engaging.

How to Evaluate this Course

Students will be provided with an opportunity to evaluate this course and your learning experience. Student participation is an integral component of this course, and your confidential feedback is important to us. We strongly encourage you to participate in the course evaluation. UW-Madison uses a digital course evaluation survey tool called [*AEFIS*](#). For this course, you will receive an official email two weeks prior to the end of the semester, notifying you that your course evaluation is available. In the email you will receive a link to log into the course evaluation with your NetID. Evaluations are anonymous. Your participation will impact future students and improve educational outcomes at UW Madison (Go Badgers!).

General Rules and Policies for the Course

We all have the right to learn and the instructors won't tolerate students disrupting the learning process for those around them. Online discussions must remain cordial and helpful. Those

individuals disrupting the learning process will be removed from class and academic penalties assessed.

University Policies That Apply to This Course

The University of Wisconsin - Madison is dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all undergraduate and graduate students to familiarize themselves with university policies regarding Network Use, Disability Accommodations, Misconduct, Religious Beliefs Accommodation, and FERPA.

Diversity and Inclusion

Institutional statement on diversity: “Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.” <https://diversity.wisc.edu/>

Accommodations for Students with Disabilities

McBurney Disability Resource Center syllabus statement: “The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.” <http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

Religious Holidays Observances Policy

Please approach me in the beginning of the semester if you have a conflict between a religious observance and scheduled quiz or assignment deadline. I will find an alternative time for you to complete the assignment. Students should notify me within the first three weeks of the beginning of classes of the specific days or dates on which they will request accommodation. For additional information, please refer to [Chapter UWS 22: Accommodation of Religious Beliefs](#).

Student Athletes

We are proud of our student athletes and willing to accommodate their travel commitments during the course, if the coach's letter is presented at the beginning of the semester.

Academic Integrity and Misconduct

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. See your [Rules, Rights and Responsibilities](#) as students.

Grievance issues

If you are having any type of issues with this class, please see me to work out an adequate solution. If you are still unhappy with the decision, please contact Allee Hochmuth (abhochmuth@wisc.edu) and make an appointment to speak with her about your situation.

Your Rights Concerning Disclosure of Academic Records

FERPA – the Family Educational Rights and Privacy Act of 1974, as amended – is a federal law that governs the privacy of student educational records, access to those records, and disclosure of information from them. For more information, please refer to [Student Privacy Rights \(FERPA\)](#).

The privacy and security of faculty, staff and students' personal information is a top priority for UW-Madison. The university carefully evaluates and vets all campus-supported digital tools used to support teaching and learning, to help support success through [learning analytics](#), and to enable proctoring capabilities. View the university's full [teaching and learning data transparency statement](#).

Lecture materials and recordings for this course are protected intellectual property at UW-Madison. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a lecture is not already recorded, you are not authorized to record my lectures without my permission unless you are considered by the university to be a qualified student with a disability requiring accommodation. [Regent Policy Document 4-1]. Students may not copy or have lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

Network Use Policy

Please read the UW-Madison's [Responsible Use of Information Technology Policy](#).

Instructor Biographies

About Professor Schoville

I grew up in a rural part of San Diego, CA. I've always had a love of the outdoors, and my parents sparked my interest in travel when I was quite young. Though I went to college hoping to become a medical doctor, I took a field biology course that sent me on a different path. Here I am now (had you asked me, I would never have imagined becoming a professor of entomology). I got a double BA at UC-Berkeley in English and Integrative Biology, and spent my summers volunteering on biology research projects. I became fascinated with genetics and conservation biology, and decided that I would eventually go back to graduate school. After undergrad, I spent a year backpacking and doing odd research jobs in South America and Australia, and then got an internship at the San Diego Zoo. I eventually returned to UC Berkeley for a PhD in Environmental Science and worked on alpine insects (I spent 5 years clambering around the Sierra Nevada mountains collecting insects and climbing peaks). I then spent several years living abroad as a research scientist (Japan and France). I've been fortunate to have the opportunity to conduct research in some of the most remote places in Siberia, China, Mongolia, Nepal, Japan, Canada, and the United States, and I maintain a long list of places I want to go.

In 2013, I joined the Entomology department at UW-Madison. My work focuses on the evolution and ecology of insects, and I work especially on alpine and agricultural pest insects. These days my work integrates field biology, greenhouse and lab experiments, bench-top genetics, computational genomics, and data science. You might think my English degree never paid off, but I can't tell you how important it's been. For example, I also serve as an editor for the journal *Molecular Ecology*, and scientific writing remains a central activity in my job.

With the birth of my daughter Wren and my son Henri, life has gotten decidedly more interesting and complicated. Though I don't have as much time to enjoy my hobbies, they are broad and include many sports (surfing, sailing, skiing, rock-climbing, mountaineering, and running), reading sci-fi and crime novels, cooking, and camping.

About Professor Groves

I've mostly a rural upbringing in southeast Iowa nearest to the city of Oskaloosa, a town named for the daughter of Chief Mahaska, 'White Cloud'. In Iowa, my family worked to lay drain tile in agriculture fields and farmed grain crops with some animals. My interest in land and the outdoors led me to a degree in Forest Management at Iowa State University (88'). During these years as an undergraduate, I was very fortunate to work with faculty across different Departments investigating riparian ecology and watershed management, fire suppression and plant-insect interactions – the latter of which was a formative experience indeed. In Dr. Elwood (Woody) Hart's laboratory I was able to participate in research aimed to decipher the complex interactions of insects, their fungal associates, and tree defense responses to these attacks. I was hooked!

After Ames, IA I pursued a MS degree at the University of Arkansas (91'), Fayetteville continuing studies describing the mycangial fungal associates of the southern pine beetle – the mycangium is a specialized sac-like structure on the pronotum of the beetle that carries fungi which assist in attacking trees. During my studies I learned that insects not only carry microbial

pathogens on the outside of their bodies (exoskeleton), but they can biologically vector other microbes like viruses, bacteria and other parasites to humans, animals and even plants. At North Carolina State University, Raleigh NC, I pursued a PhD (00') describing the seasonal sequence of animal and plant infecting viruses (Tospoviruses) which can infect and destroy many vegetable crops. The microbiological associates of insects continue to fascinate me.

Here at the UW-Madison our laboratory still works to understand the ecology and transmission dynamics of pathogens vectored by insects to plants. We study plant viruses that infect potatoes and other nightshades, as well as bacterial pathogens affecting humans and plants, that exert control over their insect vectors (Zombies!). We work to understand how pest management in vegetable crop systems result in the evolution of pesticide resistance in select insects, together with studies that reveal how our agricultural practices can be refined to increase sustainability. My wife and partner 'Carol' is a scientist here in Russell Laboratories as well, and our two children are students here at the UW! I've really enjoyed Madison, and greatly admire the faculty, students and staff in our department, they are a great bunch. We hope you get to meet many of us in the future.

About Teaching Assistant Ann Marsh

I grew up in Racine, WI a city of approximately 295,000 people, south of Milwaukee. After high school, I received an associate degree in business from The Milwaukee School of Business, which was the beginning of a 27-year career as a recruiter/trainer for four major retail companies. I recruited and trained company personnel from part time sales associates to company vice presidents. My career allowed me to live all over the world, as new stores and markets were opened, including a three-year stint in the US Virgin Islands opening eleven stores throughout the Caribbean. My career was abruptly ended after being bitten in the leg by a brown recluse spider while living in Tampa Florida in early 2000.

My two- and half-year recovery was riddled with many ups and downs. I suffered through four major and two minor surgeries. After the first surgery, the doctor would not send me to physical therapy because he claimed I was going to lose my leg anyway, so it didn't matter. I did not accept this and started walking short distances within three days post-surgery. I now walk with almost no limp and very little pain. As I recovered, I made the decision to start a new chapter in my life by returning to college.

After meeting with several counselors and not wanting to negate my 27-year retail career, I decided to major in pre-pharmacy at The University of Florida system. During my first semester, I enrolled in beginning biology where I had to dissect a locust and I thought that was coolest thing I had ever seen! I continued down the pre-pharmacy path until some unfortunate events landed me at The University of Minnesota. While in lab one day, the professor noticed that I could work under a microscope efficiently with many different types of tools. I was invited to work with a doctoral student working on morphological differences of ambush bugs. My job was to remove the legs, slide mount and measure them. I was also tasked with organizing all of the research specimens. It was at this point I decided I wanted to work in taxonomy of insects. After a few more twists and turns, I finished my undergraduate degree at The University of Wisconsin Whitewater. It was here that I worked on an undergraduate research project comparing dung beetle populations between organic and inorganic beef farms. I graduated with a

double major in Biology and Chemistry, with a minor in Philosophy in 2013. I met Dr. Daniel Young during a presentation he gave at Whitewater. As a graduate student I worked on a subfamily of rove beetles called Tachyporine. I am getting ready to start working on revision of a genus of this group from Mexico.

Grading Rubrics

Selfie Assignment Rubric

Ratings					Pts
20 pts Full Marks All information included in the selfie assignment.	15 pts Most information included Either the selfie image does not adequately identify the student or the written information is incomplete.	10 pts Half Credit Either selfie image is missing or substantial written information is missing.	5 pts Minimal information included Selfie image missing or most written information is missing	0 pts all required elements missing Assignment not turned in	20
					Total Points: 20

Manduca Log Rubric											
Criteria		Ratings								Pts	
Adult Moth Turned In Adult moth turned in and image appears in journal	250 pts Full Marks				0 pts No Marks				250 pts		
Formatting and Required Content Cover sheet with your name, title, table of contents and group members names	10 pts Meets Expectations All required contents present		7 pts Good One of the required elements missing		4 pts Poor Two required elements missing		0 pts Unacceptable All required elements missing		10 pts		
Formatting and Required Content Daily dated observations from the starting week	20 pts Meets Expectations All dates present from from the starting week		15 pts Good Some dates missing from the starting week		10 pts Adequate Many dates missing from the starting week		5 pts Poor Most dates missing from the starting week		0 pts Unacceptable All dates missing from the starting week	20 pts	
Formatting and Required Content Drawings/photos/graphical representations are clear and informative	20 pts Excellent All images/photos/graphical representation are clear and provide compelling information		15 pts Meets Expectations Most images/photos/graphical representation are clear and informative		10 pts Good Some images/photos/graphical representation are clear and some are informative		5 pts Poor A few images/photos/graphical representations are clear and informative		0 pts Unacceptable No images/photos/graphical representation are clear and informative	20 pts	
Formatting and Required Content Pictorial representation of each developmental stage	20 pts Excellent Images demonstrate an excellent timeline of developmental stages, with informative details		15 pts Meets Expectations Images demonstrate a good timeline of development, with no major developmental changes missing.		10 pts Good Images demonstrate a good timeline of development, but images documenting major developmental changes are missing.		5 pts Poor Images demonstrate a poor timeline of development and multiple images documenting major developmental changes are missing.		0 pts Unacceptable Images do not demonstrate the timeline of development.	20 pts	
Formatting and Required Content Group Observation Log	30 pts Meets Expectations Weekly reports from the rearing group all present		20 pts Good Weekly reports from the rearing group mostly present		10 pts Poor Many weekly reports missing.		0 pts Unacceptable Weekly reports from the rearing group not present		30 pts		
Quality and Effort Key details are labeled/indicated in images and discussed in entry	10 pts Excellent Excellent effort to use images to convey information, throughout developmental stages.		7 pts Meets Expectations Good effort to use images to convey information, throughout developmental stages.		4 pts Poor Limited effort to use images to convey information, throughout developmental stages.		0 pts Unacceptable No effort to use images to convey information, throughout developmental stages.		10 pts		
Quality and Effort Daily observation effort	20 pts Excellent Excellent observations that go beyond describing color, size, molting, and developmental stages. Morphological features, physiological processes, and behaviors pointed out.		15 pts Meets Expectations Observations that describe color, size, molting, and developmental stages. Some morphological features, physiological processes, and behaviors are pointed out.		10 pts Good Good observations of color, size, molting, and developmental stages.		5 pts Poor Poor observations of color, size, molting, and developmental stages.		0 pts Unacceptable No observations present.	20 pts	
Quality and Effort Increasing sophistication of biological terms	20 pts Excellent Excellent use of new terms increasing the accuracy of the observations.		15 pts Meets Expectations Use of terms increases and improves the accuracy of the observations.		10 pts Good Some new terms are integrated into observations.		5 pts Poor Only a few terms are used.		0 pts Unacceptable No new biological terms are used.	20 pts	
Quality and Effort Hypotheses, revelations and thoughtful and creative comments	50 pts Excellent Excellent research questions (>> 7) are asked throughout the project. Outside research completed is significant and includes citations.		40 pts Meets Expectations Strong effort to ask research questions (6 to 7 questions) throughout the project length. Outside research completed includes citation.		30 pts Good Some good research questions are asked (4 to 5 questions) throughout the project length. Outside research completed includes citation.		20 pts Fair Some research questions are asked (2 to 3 questions) throughout the project length. Outside research completed includes citation.		10 pts Poor Few research questions are asked (1 question) throughout the project. Outside research completed includes citation.	0 pts Unacceptable No outside research is conducted.	50 pts
Synthesis and Integration Conclusion section demonstrating what you learned.	50 pts Excellent Summary Excellent demonstration of critical thinking and your thoughts on the project. The outside research on at least three figures/tables is compelling and insightful, and includes works cited section (with more than four sources). Composed in 3-4 pages.	45 pts Meets Expectations Very good demonstration of what you learned including your thoughts on the project and outside research on two figures/tables that you found interesting with works cited section (at least four sources). Composed in 3-4 pages.	40 pts Good Good demonstration of what you learned including your thoughts on the project and outside research on two figures/tables that you found interesting with works cited section (at least three sources). Composed in 2-3 pages.	35 pts Fairly Good Fairly good demonstration of what you learned including your thoughts on the project and outside research on one figure/table that you found interesting with works cited section (at least two sources). Composed in 2 pages.	30 pts Fair Fair demonstration of what you learned including your thoughts on the project and outside research on one figure/table that you found interesting with works cited section (at least one source). Composed in at least 1 page.	25 pts Fairly Poor Fairly poor demonstration of what you learned about the project and/or no outside research. Composition is brief.		20 pts Poor Poor demonstration of what you learned about the project and/or no outside research. Composition is brief.	0 pts Unacceptable No conclusion section is present.	50 pts	
Total Points: 500											

Microdocumentary Rubric  		
Criteria	Ratings	Pts
Appropriate Subject Did you make the right choice for your subject? Is it about an insect or insects (not a spider or other invertebrate! And not Manduca sexta!)? Did you identify the insect to order using a scientific name?	This area will be used by the assessor to leave comments related to this criterion.	10 pts
Curiosity and Creative Engagement Stop and think about what would interest both you and your viewer. Are you interested enough in the subject to carry it off? Were you able to make the topic interesting and relevant to your audience? What makes me, the viewer, want to keep watching your production?	This area will be used by the assessor to leave comments related to this criterion.	20 pts
Media Craftsmanship Did you prepare a documentary by integrating media (video, still images, music, etc) that is appealing to an audience of college-aged students? Does the documentary engage the viewer? Did you spend enough time to make a high quality microdoc that is edited?	This area will be used by the assessor to leave comments related to this criterion.	30 pts
Voice Narration Did you narrate the microdocumentary clearly and in your own voice (not using a computer-generated voice)? Is the narrative appealing to an audience of college-aged students? Is the sound quality of your narration of high quality?	This area will be used by the assessor to leave comments related to this criterion.	30 pts
Depth of Research and Inquiry Did you use outside research (more than 3 sources) to assist you in your presentation? This is not a science fiction documentary, so it must be a factual presentation. Your statements and interpretations should be supported by facts and sources. Material drawn from other sources (including images and video) should be cited.	This area will be used by the assessor to leave comments related to this criterion.	50 pts
Thorough completion of project Does your documentary contain the required parts of the assignment (title, narrative/textual aids, observations and interpretations, credits)? Is it at least 3 min in length?	This area will be used by the assessor to leave comments related to this criterion.	10 pts
Total Points: 150		

Conceptual Response Rubric



Criteria	Ratings						Pts
Formatting Title slide contains your name, date, essay number; text on slides uses a minimum of 10-point font for readability.	5 pts Full Marks All formatting items present and clearly presented.		3 pts Good Some required formatting elements not present.		0 pts Unacceptable No formatting requirements present.		5 pts
Proof-reading Spelling, punctuation and grammar	10 pts Excellent No improvement needed	7 pts Meets Expectations There are only a few technical errors found. Most of these errors can be corrected by proof reading prior to submitting.	5 pts Good There are several few technical errors found. Most of these errors can be corrected by proof reading prior to submitting.	2 pts Poor There are many technical errors found. Most of these errors can be corrected by carefully proof reading prior to submitting.	0 pts Unacceptable There are frequent technical errors found. Most of these errors can be corrected by proof reading prior to submitting.		10 pts
Title The title engages the reader	5 pts Excellent Engaging relevant title present.		3 pts Good An adequate title is present that somewhat engages the reader and/or is somewhat relevant to the topic.			0 pts Unacceptable No title present.	5 pts
General Statement of Problem Introduction to the topic is engaging and clear.	10 pts Excellent Opening slide captures the reader attention. No improvement needed.	8 pts Meets Expectations The opening slide does a good job of capturing the reader's attention and introducing the topic.	6 pts Good The opening slide merely introduces the topic.	4 pts Fair The opening slide could have been better thought out to capture the reader's attention or doesn't adequately introduce the topic.	2 pts Poor The opening slide is not well designed to engage the reader or explain the topic.	0 pts Unacceptable The opening slide did not capture the reader's attention and didn't follow the topic.	10 pts

Organization Conceptual response is composed of an introduction, body, and conclusion.	10 pts Excellent Conceptual Response has a clearly defined introduction, body and conclusion. Introduction opens the response and lets the reader know what is going to be discussed. The conclusion does a great job of reminding the reader of the main argument and summarizing the key concepts.	8 pts Meets Expectations Conceptual Response has a strong introduction, body and conclusion. Introduction opens the response and lets the reader know what is going to be discussed. The conclusion effectively reminds the reader of the main argument and summarizing the key concepts.	6 pts Good Conceptual Response has a good introduction, body and conclusion. Introduction opens the response and lets the reader know what is going to be discussed. The conclusion does an good job of reminding the reader of the main argument and summarizing the key concepts.	4 pts Fair Conceptual Response has an unclear introduction, body and/or conclusion. Introduction does not clearly let the reader know what is going to be discussed. The conclusion does an adequate job of reminding the reader of the main argument and summarizing the key concepts.	2 pts Poor Conceptual Response is lacking an introduction, body and/or conclusion.	0 pts Unacceptable Conceptual Response is lacking appropriate organization.	10 pts
Conceptual linkages and Visual Integration Conceptual response is composed of graphics that support the narrative's introduction, body, and conclusion (e.g., flow chart, process map, workflow, or schematic), with strong linkages between slides and between the opening and closing sections.	20 pts Excellent Conceptual Response has a clear graphics that represent ideas and convey meaning in the introduction, body and conclusion. The graphics do a great job of explaining the main argument and summarizing the key concepts. Excellent linkages between slides and between the opening and closing sections.	16 pts Meets Expectations Conceptual Response has very good graphics that represent ideas and convey meaning in the introduction, body and conclusion. The graphics do a very good job of explaining the main argument and summarizing the key concepts. Very good linkages between slides and between the opening and closing sections.	12 pts Good Conceptual Response have graphics that convey meaning in the introduction, body and conclusion. The graphics do a good job of explaining the main argument and summarizing the key concepts. Linkages between slides could be stronger and no clear linkage between opening and closing sections.	8 pts Fair Conceptual Response have some graphics that convey meaning in the introduction, body and conclusion. The graphics do a fair job of explaining the main argument and summarizing the key concepts. Linkages between slides lacking and no clear linkage between opening and closing sections.	4 pts Poor Conceptual Response has poor graphics that do not convey meaning in the introduction, body and conclusion. The graphics do a poor job of explaining the main argument and summarizing the key concepts. Poor linkages between slides and no defined linkage between opening and closing sections.	0 pts Unacceptable Conceptual Response is lacking appropriate graphical representation of ideas. No linkages between slides or sections of the response.	20 pts

Argument Support Appropriate scientific evidence is gathered to support the conceptual response.	10 pts Excellent Argument is strongly supported using appropriate examples, ideas learned in lecture or outside sources. All facts/source materials (including images) are cited and a full citation is provided in a works cited section at the end of the response. More than 3 primary citations (not including image citations) are used to develop the narrative response.	8 pts Meets Expectations Argument is well supported using appropriate examples, ideas learned in lecture or outside sources. All facts/source materials (including images) are cited and a full citation is provided in a works cited section at the end of the response. Three primary citations (not including image citations) are used to support conceptual response.	6 pts Good Argument has some supporting examples, ideas learned in lecture or outside sources, some of which are appropriate. Some outside primary sources are cited (at least two, not including image citations) and a full citation is provided in a works cited section at the end of the response.	4 pts Fair Argument has few supporting examples, ideas learned in lecture or outside sources, or they are inappropriate. Several outside sources are not cited and/or a full citation is lacking in a works cited section at the end of the response.	2 pts Poor Argument has inappropriate examples, ideas learned in lecture or outside sources. Most outside sources are not cited and a full citation is lacking in a works cited section at the end of the response.	0 pts Unacceptable Argument has no supporting examples, ideas learned in lecture or outside sources.	10 pts
Topic well covered Conceptual response addresses the prompt.	10 pts Excellent Topic in conceptual response is well covered.	8 pts Meets Expectations Topic in conceptual response is covered well, but discussion could have been a bit more robust.	6 pts Good The topic of the conceptual response is covered, but the discussion needs improvement.	4 pts Fair The topic is fairly well covered, but the discussion is deficient.	2 pts Poor The topic is poorly covered.	0 pts Unacceptable Topic chosen was not covered.	10 pts
Critical Thinking The answer to the problem is logical and demonstrates critical thinking.	10 pts Excellent The conceptual response does an excellent job of progressing through a logical, convincing argument, with strong evidence of critical thinking.	8 pts Meets Expectations The conceptual response does a very good job of progressing through a logical, convincing argument. There is good evidence of critical thinking on display.	6 pts Good The conceptual response does a good job of progressing through a logical, convincing argument. A bit more thought into anticipating what the reader needs to advance to the next idea would be helpful. There is evidence of critical thinking but more work could be done.	4 pts Fair The conceptual response has some gaps in the logical flow of ideas. More thought into how the ideas flow in the conceptual response would be helpful. Critical thinking needs to be improved.	2 pts Poor The conceptual response has significant gaps in the logical flow of ideas and a weak display of critical thinking.	0 pts Unacceptable The conceptual response does not have a logical flow of ideas and does not display critical thinking.	10 pts

Originality Conceptual response is a creative and original submission by the student	10 pts Excellent Excellent and engaging story line, clearly unique and an independent expression showing the student's effort	8 pts Meets Expectations Very good flow of ideas and compelling story line, the work is clearly independent.	6 pts Good Good flow of ideas and good story line, but story lacks creativity or does not demonstrate original effort.	4 pts Fair The flow of ideas and/or story line need improvement to demonstrate creative engagement and more effort is needed to demonstrate independent effort.	2 pts Poor The conceptual response had little creative engagement or independent effort.	0 pts Unacceptable The conceptual response had no creative engagement or effort to demonstrate independent thought.	10 pts
Total Points: 100							