

EVPP 423 – 001 CRN - 76732
Beekeeping and Sustainability – FALL 2020

Innovation Hall 316

Wednesdays 10:30 am - 1:10 pm

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Office Hours Wednesdays 2:00pm – 5:00pm or by Appointment

Syllabus

Course Description

This course explores the social structure, intense cooperation, and organization of honey bees as a natural phenomenon. The main course goals are introducing students to sustainable beekeeping through lecture and hands-on field experience and examining beekeeping as a tool for sustainable development. Recognizing the nutritional and economic impact that honey bees have on the food we eat, this course explores the current challenges accountable for the increasingly high losses of native and managed bee colonies in recent years. This course also examines the resulting effects of these losses on beekeeping and on pollination industries worldwide as they adjust to the losses and attempt to provide the food we want at a cost we can afford. Looking beyond the United States, we will review beekeeping throughout recorded history, examine the social impact and implications of beekeeping around the world, and explore its current place in the modern socio-economic structure as well as implications for beekeeping in the future.

Learning Objectives

Students will:

1. Examine the history of beekeeping and its contemporary role in the global economy
2. Analyze the biology and ethology of honey bees
3. Explore beekeeping as a tool for sustainable development.
4. Develop a range of skills, tools and questions for analyzing various texts relating to beekeeping and sustainability.
5. Become competent beekeepers
6. Effective communicators
7. Have an interdisciplinary perspective
8. Recognize the importance of ethical decisions
9. Knowledgeable about team dynamics and the characteristics of effective teams
10. Understand the value of diversity and the importance of managing diversity in the context of business and global trade
11. Demonstrate oral and written communication skills and will be critical thinkers.

Required Texts

- *The Beekeeper's Bible* – Stewart – Tabori – Chang, New York. Available at www.amazon.com
- *A Field Guide to Honey Bees and their Maladies*. Penn State Agricultural Science (to be provided)
- Primary (peer-reviewed) literature provided to students as required

Course Evaluation:

• Class Participation	10 Points
• Class Quiz (6 Quizzes 1 point each)	6 Points
• Literature Review Presentation	4 Points
• Journal Front Line and Reflective	10 Points
• Experiential Learning Activities	20 Points
• Exam	20 Points
• Group Presentation Final Project	20 Points
• Final Paper	10 Points
• Total	100 Points

Grading Scale

(A = 100 - 93) – (A- = 92-90) – (B+ = 89-86) – (B = 85-80) – (C = 79-70) – (D = 69 - 60) - (F = >60)

Class Participation - (10 points): Students are expected to attend class, to participate actively and responsibly, to hand in all assignments when due, and to support other students in the learning process. Each student will be an active learner, coming fully prepared to engage in that enterprise by raising questions and suggesting answers or tracks to follow in search of answers. Students are expected to read, and be prepared to discuss, the assigned texts. The instructor will evaluate students for individual contributions to classroom discussions.

Class Quiz (6 Quizzes 1 point each) (6 Points)

Literature Review Presentation - (4 points): This activity involves working in groups of two people. Each group will select related peer reviewed articles for analysis. With group members using the same general topic, although not necessarily with the same focus, each student will summarize the main points of their specific article and present the summary to the class for comment and discussion. Students will be graded on their individual presentation as well as the ability of the group to develop points of debate related to the topic(s) discussed in the articles. Each student is to record and formally cite the article and the main points chosen for discussion in their journal.

For example: If a group selects a topic such as “beekeeping in Asia” and finds articles describing foraging differences or competition between *Apis mellifera* vs. *Apis cerana*, then each student in the group will find one article discussing this same topic to present to the class. Students in the group are not to use the same article. The student summary of her/his specific article will either highlight points of view that support the viewpoints presented by other members in the group, or present and support opposite points of view. Such analysis is intended to prompt class discussion and interaction, as well as increase understanding and exposure to multiple scholarly viewpoints.

Student groups are to present their selected articles to the professor for approval at least one week before the scheduled presentation. An electronic copy of each article is to be made available for class members’ review via the class DropBox. If articles are not placed in DropBox on time, 2 (two) points will be deducted from the student’s score.

Note that a good place to search for articles related to class topics is The Mid-Atlantic Apiculture Research and Extension Consortium (MAAREC), <http://agdev.anr.udel.edu/maarec/>.

Journaling - (10 points): Two types of journaling are required and are a vital component of this course. As thorough record-keeping is an essential quality of sound research, keen observation and good note-taking ability is a vital asset to research and will provide your individual project with a

written and illustrated history of data. The experiences you record will be used to populate your final project with first-hand accounts and anecdotal evidence of your research topic. While you may think your memory is infallible, day after day of field work, data collection, and new experiences have a tendency to blend together until the details are indecipherable. Keeping a thorough field notebook is both an art and a science.

Your field notebook will include two types of entries:

1. Front-line journaling: These are notes taken during the actual encounter, observation, or experience that include drawings, habitat descriptions, behavioral notes, verbal exchanges, etc. This type of journaling creates the raw data/observational framework of your note-taking.
2. Reflective journaling: This type of journaling fleshes out your front-line entries into a complete narrative. The process requires a filling-in of your frontline notes to create a coherent story.

And don't forget the essential elements that should be noted with every entry – name, date, time, weather, location, etc. Your notes should be thorough and clear enough that another person (like your professor!) can easily read and understand them.

Your journal is an important component to your success in this course and will be graded periodically throughout the semester. Plan to spend a minimum of two hours per week on your journal.

Experiential Learning Activities - (20 Points): This is an experiential learning class. We will have several field activities over the course of the semester (please refer to the syllabus). Students will work in groups of two; each group will be responsible for the successful management of at least one bee hive. Field activities will include winter management, early spring management, swarm control techniques, colony reproduction, and colony preparation to obtain a good honey harvest; if time allows we will work in value-added products of the hive.

These hands-on beekeeping activities will take place in the GMU Fairfax campus apiary during regular class hours where best-practice beekeeping procedures will be modeled, procedures that you will use in the hive or hives that you are managing.

Please note that you must complete these experiential learning requirements in order to pass the class.

Some additional Field activities will take place on Saturdays, and the apiary locations for these extra activities may vary. Meeting times and specific details will be discussed during the first class period.

A special course fee of one hundred dollars (\$100.00) covers the costs associated with the various field activities bee population needs in this course. This fee will be automatically charge to your George Mason University student account.

Exam - (20 points): Will cover all lectures to date and will be a one and a half hour multiple choice and short essay exam. The exam will be closed book and will take place in the classroom.

Group Case-Study Presentation - (20 Points): Student groups will present the results of their case study to the class. Each presentation must include a background history and identification of the problem. The current state of affairs demonstrating the consequences of the problem and a conclusion presenting the possible solutions. Presentations will take place at the end of the semester and final grades will be influenced by peer-evaluations of the group's work. All students in the same group will receive the same grade for the presentation.

Research Paper - (10 Points): Each student will produce a written paper supporting the thesis he/she presented in the case study.

A **final paper** that includes:

An introduction in the following format:

- Title
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Acknowledgments
- Literature cited

Literature cited

It requires a minimum of 10 scholarly sources properly cited (using MLA or APA format) both in-text and in a works cited at the end of the paper.

Course Policies

Attendance and Preparation

Students are expected to attend every class session and to be prepared, meaning having completed the required readings and other assignments before class begins.

Late Work

Assignments are to be turned in at the beginning of class on the due date. For work turned in late but within 24 hours after it is due, scores will be reduced by 10%; by 20% if it is between 24 and 48 hours late. No work will be accepted without a valid written excuse if it is more than 48 hours late.

Makeup and Extra Credit

No makeup work will be given unless you have made prior arrangements with the instructor.

Makeup requests for the Midterm and the Case Study Presentation will only be approved for students that present a doctor's note that states the students cannot or could not attend class, or if there is a documented death or grave injury in the student's immediate family.

A note on the Honor Code. George Mason University has an Honor Code, which requires all members of this community to maintain the highest standards of academic honesty and integrity. Cheating, plagiarism, lying, and stealing are all prohibited. Always cite your sources – if you do not, it is plagiarism. Plagiarism means lifting someone else's ideas or words and presenting them as your own without proper attribution of the source. This requirement is for all sources and resources, including Internet references. Use an approved citation method, such as MLA, APA, etc. (NOTE: The school of business has its own honor code)

The Office of Disability Resources

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.

Enrollment Statement

Students are responsible for verifying their enrollment in this class.

- Last Day to Add – August 31st, 2020
- Last Day to Drop – September 8th, 2020

- Selective Withdrawal Period September 29th – October 28th 2020

After the last day of the Selective Withdrawal Period, withdrawing from this class requires the approval of the dean and is only allowed for nonacademic reasons.

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Beekeeping and Sustainability Class – Fall 2020
Lecture – Innovation Hall 316 - Apiary
Wednesdays 10:30 am - 1:10 pm

Weekly Schedule

Class 1 – August 26 – Introduction to Beekeeping

- History of beekeeping from ancient to current days
- Reading: **The Beekeeper's Bible p 12-63**

Class 3 – September 2 – Field ONE - We will meet at the apiary

- Bee Management I
- GMU apiary

Class – September 9 – Bees and beekeeping in the world (Group 1) Test 1

- Bees of the world
- Economic importance of beekeeping

Reading: **The Beekeeper's Bible 64-93**

Class 4 - September 16 – Field TWO - We will meet at the apiary

- Bee Management II
- GMU apiary
- Reading: ABJ. V.115 #8 (Aug 2015) pages 875-879

Class 5 – September 23 – *Apis mellifera* (G2) (Group 2) Test 2

- Anatomy
- Physiology
- Reading: **The Anatomy of the Honey Bee RE Snodgrass**

Class 6 – September 30 – Field THREE - We will meet at the apiary

- Bee Management III
- GMU apiary

October 10, 2015 (Monday) Columbus Day Recess

**Class 7 – October 7 – *Apis mellifera* Biology of a Super organism (Group 3) Test 4
Research Proposal Due**

- The colony
- Feral vs. Managed
- Bee ethology
- Mammal Characteristics of the honey bee
- Honey bee strategies for success
- Bee diet
- Bee intelligence
- Bee society
- Reading: The Beekeeper's Bible 94-118
- Reading: The Honey Bee Dance Language (provided)
- Reading: The honey Bee as a Super Organism Thomas Seeley (provided paper)

Class 8 - October 14 – Field FOUR - We will meet at the apiary

- Bee Management IV
- GMU apiary

Class 9 – October 21 – Bee Health and Reproduction (Group 4) Test 5

Hive Products

- Healthy Bees
- Honey bee diseases
- Community Driven Development
- Honey tasting
- Reading: **A Field Guide to Honey Bees and Their Maladies (provided)**
- **Reading: The Beekeeper's Bible 234-246**

Class 10 – October 28 – Field FIVE - We will meet at the apiary

- Bee Management V
- GMU apiary

Class 11 – November 4 - Pollinators and Pollination (Group 5) Test 6

- Bee hives and equipment
- The Beekeeping Year
- Flowers and bees
- Flowers and other pollinators
- Film on pollination **“Wings of Life”**
- Reading: **The Beekeeper's Bible 119-122, 131-143**
- Reading: **Bee Pollination hand Book McGregor (provided)**

Class 12 November 11 - How to set up an apiary Beekeeping as a tool for sustainable development (Group 6)

- Apiary distribution
- Apiary location
- Record Keeping
- Finding Bees
- Reading: Value Added Products (provided)
- Reading: The Beekeeper's Bible 154-235

Class 13 November 18 - Case Study Group Presentations

- **Paper due**
- **Journal due**

November 27 – 30 November 2019 - Thanksgiving Break

Class 14 – December 2 – EXAM