School of Agriculture
Trades & Environment

BK 133 INTRODUCTION TO BEE DISEASES & MANAGEMENT
1.5(2-0-1) 8 WEEKS; 24 HOURS

COURSE OUTLINE – JANUARY 2012

INSTRUCTOR: TBA **PHONE:** TBA
OFFICE: TBA **E-MAIL:** TBA

OFFICE HOURS: TBA

PROPOSED REQUIRED TEXT/RESOURCE MATERIALS:

Marla Spivak &Gary Reuter, *Honey Bee Diseases and Pests* (University of Minnesota Extensions, 2010). Other resources as set by the instructor.
Updated CAPA disease manual.

PROPOSED RECOMMENDED READINGS:

L.L. Langstroth, *The Hive and the Honey-Bee: The Classic Beekeeper's Manual* (Dover Publications, 2004).
Leslie Bailey and Brenda Ball, *Honey Bee Pathology* (Academic Press, 1991).
Journal of Apicultural Research (International Bee Research Association, 2011).
J. Inv. Path. Bee Diseases Issue

CALENDAR DESCRIPTION:

This is an introduction to microbiology, honey bee diseases and the integrated pest management approach to disease management.

CREDIT/CONTACT HOURS:

This course consists of 2 hours of lecture per week and 1 hour of lab per week for 8 weeks; total of 24 course hours.

DELIVERY MODE (S):

Course work includes lectures, labs, discussions, assigned readings, a midterm, and a final exam.

OBJECTIVES :

1. Identify common bee diseases and pests

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2. Understand control and prevention measures against diseases and pests
3. Understand the integrated pest management approach to treatment

PROPOSED EVALUATION:

Midterm Exam & quizzes	30%
Final Exam	50%
Class Participation	20%

STUDENT RESPONSIBILITIES:

- Students are expected to commit the required time to complete this course. Requests to reschedule assignments or exams are extraordinary and will only be granted under such circumstances.
- Submitting assigned work on the dates set by the instructor. Late assignments may be penalized.
- Regular attendance is important to success. The lectures contain important information and interpretations for exams and instructions for laboratory exercises.

PROPOSED CONTENT OUTLINE --*specific content to be determined by the course instructor* --

1. Identify Organisms Causing Disease and a brief introduction to treatment options
    - American Foul Brood
    - European Foul Brood
    - Chalkbrood
    - Sac Brood
    - Chilled Brood
    - Other brood diseases
    - Nosema Disease
    - Honey Bee Tracheal Mite
    - Varroa
    - Small hive beetle
    - Bee viruses
    - Africanized Honey Bees
    - Wax moth
    - Other hive and stored products pests
2. Lab work
    - Use a micoscope to assess severity of nosema (apis and ceranae)
    - Use a microsope to determine presence of tracheal mite
3. Pests of the Apiary
    - Rodents and big animals
    - Other pests
4. Integrated Pest Management
    - Concept, philosophy and implementation
    - Introduction to common treatment strategies

Skills

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- Basics of host-pathogen interactions
    - Virulence and burn-out
    - Co-evolution, arms race, and the red queen
- Understanding of bee pests/pathogens (In Hive)
    - Organization
        - Type of pathogen
        - Infection window
        - Infection mechanism
    - Pathogenicity
        - Virulence
        - Frequency of occurrence
    - Identification
        - Time of year
        - Signs and symptoms
        - Microscopy and culture(?)
- Management of bee diseases
    - Prevention
        - Reduce transmission
        - Prevent pathogen buildup
        - Identify economically damaging thresholds
    - Identification
    - Cultural Controls
    - Organic/natural treatments
    - Synthetic treatments
        - Antibiotics
        - Miticides
        - Other pesticides
- Preventing damage from other pests
    - Bears
    - Skunks
    - Racoons (?)
        - Do these actually do any damage?
    - Ants
    - Wax moths
    - Hillbillies (vandalism)

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    - Beekeepers (theft)
- Pesticide exposure
    - Chronic vs acute
- Future of honeybee health
    - Synergistic effects
        - Multi-pathogen infection
        - Synergistic pesticide effects
    - Pathogens in other parts of the world
        - Tropilaelaps mites
        - Cape Honey bee
        - Apis cerana
        - Africanized honeybees
    - Industry directions
        - Fewer chemical treatments
        - Integrated pest management strategies
        - Integrated colony/operation management systems

Rough outline

Wk 1 Host pathogen interactions

Wk 2 – 7 Survey of pathogens

Wk 7 – 8 Future of Honeybee Health

Course will run 2 x 1-h lectures, 1 x 1-h lab weekly

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