

## 'ENTO/PLP2143 Spring 2010 Program schedule'

### **Lecture 1-Jan 11-Week 1**

Introduction. Syllabus. Faculty and student expectations dynamic and scope of the course. Specialty areas within biosecurity, building a career in biosecurity. Sciences related to biosecurity and microbial forensics. Biosecurity and Agricultural biosecurity definitions. Scientific and political framework. Relevance. Biosafety, biodiversity and other relevant and associated concepts. Sciences related to biosecurity and microbial forensics and the importance of the political framework. **Assignment No. 1 (20 points)** Reading of assigned material and answer the questionnaire. **Due date:** Jan 18, 2011.

### **Lecture 2-Jan 13-Week 1**

Comparison of the concepts of Terrorism, bioterrorism, agroterrorism regarding Biosecurity and plant, animal and food biosecurity. Agricultural, political and economic impacts of dangerous introductions. **Assignment No. 2 (20 points)** Reading of assigned material and answer the questionnaire. **Due date:** Jan 20, 2011.

### **Lecture 3-Jan 18-Week 2**

Characteristics of a bioweapon Cases of microorganisms used as weapons in war time. **Assignment 1 due.**

### **Lecture 4-Jan 20--Week 2**

Facts about international trade and diverse reasons to introduce. Global movement of humans, pests, microorganisms, weeds, and seeds. Examples and study cases of beneficial and detrimental introductions related to terrestrial, marine, and aquatic scenarios. **Assignment 2 due.**

### **Lecture 5-Jan 25--Week 3**

Introduction to incursion (invasion) biology. Related terminology (indigenous, exotic, naturalized, invasive, pests). Types of introductions. Disruption of the normal ecosystem function by exotic species.

### **Lecture 6- Jan 27-Week 3**

Invasive species. More examples and study cases of detrimental introductions related to terrestrial, marine, and aquatic scenarios. **Assignment No. 3 (20 points)** Application for permit to move live plant pests or noxious weeds, PPQ 526. Free choice of insect, microbe or weed of interest for students, or suggested by the instructor after students request. Individual project, but consultation with peers, faculty or internet sources is allowed. **Due date:** Feb 03, 2011.

### **Lecture 7-Feb 01-Week 4**

1<sup>st</sup> Guest speaker. **Dr. Michael Reinskind**. **Video-lecture**. Insect as vectors of animal and human diseases. Unwanted insects/pests of biosecurity relevance for the U.S. and Oklahoma.

### **NO classes- Feb 03-Week 4**

OSU closed due to inclement weather. **Assignment 3 due, but extended.**

### **Lecture 8- Feb 08-Week 5**

2<sup>nd</sup> Guest speaker. **Dr. Astri Wayadande**. Insects as vectors of plant diseases. Unwanted insects/pests of biosecurity relevance for the U.S. and Oklahoma. **Assignment 3 due.**

### **Lecture 9 &10- Feb 10-Week 5**

Epidemics and epizootics. Conflicting definitions in different fields. Incursion pathways (routes) and common biosecurity gaps. Phases of the incursion or invasion process. Ecosystems and diffusion models. Predicting invasions. Exotic species and their implications for evolution. Study cases in terrestrial, marine, and aquatic scenarios.

### **Lecture 11- Feb 15 -Week 6**

3<sup>rd</sup> Guest speaker. **Dr. Jacqueline Fletcher**. Biosecurity and forensic sciences.

### **1" examination-Feb 17-Week 6**

#### **Lecture 12-Feb 22-Week 7**

The quarantine process. How agricultural quarantine and forensic plant pathology overlap. Border, post-entry quarantine, post-entry quarantine transitional facilities, policy, pre-clearance and post-clearance issues. Containment levels and challenges. Border and port of entry detection techniques, including sniffer dogs, X rays and traveler profiling.

#### **Lecture 13- Feb 24-Week 7**

Diagnostics vs. detection, concepts and other related terms. Principles of common diagnostic methods and diagnostic strategies. Serological and molecular methods for detection and diagnostics of incursion pests, and diseases. Trends in diagnostics and diagnostic research in biosecurity. The diagnostic laboratory. **Assignment No. 4 (20 points)** *Reading of assigned material and answer the questionnaire.* **Due date:** Mar. 03, 2011.

#### **Lecture 14- Mar 01-Week 8**

4<sup>th</sup> set of Guest speakers. Graduate students **Trisha Dubie** and **Chris Timmons** presentations. **Your professor:** Food safety and food biosecurity. Supportive material **Dr. Li Ma**, OSU NIMFFAB. **Video-lecture and slides.**

#### **Lecture 15-Mar 03-Week 8**

The concept of biosecurity zones Classic vs. molecular diagnostics? More on 'Predetermined' and 'non predetermined tests'. Study cases of methods for detection of sources of unwanted or regulated incursion pests, pathogens, weeds and seeds in agriculture and/or the environment. **Assignment 4 due.**

#### **Lecture 16-Mar 08-Week 9**

Microbial forensic, perspectives and needs. Initial investigation, (detailed) investigation and response. The relevance of tracking back. Risk analysis and rapid risk assessments. Elements of an incursion assessment report. Ramifications and costs associated with a new organism/invasive species outbreak.

**Assignment No. 5 (20 points)** *Country freedom report.* Region and pest/disease to be assigned or of interest for the student. **Due date:** Mar. 10, 2011.

#### **Lecture 17-Mar 10-Week 9**

5<sup>th</sup> Guest speaker. **Dr. Trenna Blagden**, OSU NIMFFAB. Laboratory quality control and types of accreditation. Rigor and characteristics of detection and diagnostic procedures. Standard operational procedures (SOPs).

### **Spring Break-Mar 14 to 18-Week 10**

**Please Note Assignment 5 is due just after spring break.**

### **Lecture 19-Mar 22-Week 11**

Laboratory demonstration & practice 1. Detection procedure using Immuno lateral flow devices & forensic DNA fingerprinting. Venue: The National Institute for Microbial Forensics & Food and Agricultural Biosecurity (NIMFFAB) laboratory at the Henry Bellmon Research Center. Assembly will be at the Lobby of the building 9:00 AM sharp. **Assignment No. 6 (20 points)** *Laboratory report 2.* Detection using a lateral flow device. **Due date:** Mar. 29, 2011. **Assignment 5 due.**

### **Lecture 20-Mar 24-Week 11**

Laboratory demonstration & practice 2. Continuation of forensic DNA fingerprinting. **Assignment 7. (20 points)** *Laboratory report 2.* Detection using forensic DNA fingerprinting. **Due date:** Mar. 29, 2011.

### **2" examination-Mar 29-Week 12**

**Assignments 6 & 7 due.**

### **Lecture 21-Mar 31-Week 12**

NIMFFAB Graduate Students symposium. **Jon Daniels, Stephany Rogers, Sharon Andreason, Donna Caasi and Ian Moncrief.** Trends in microbial forensics & diagnostics research, graduate students will share experiences, work visions and their research results in biosecurity and forensics sciences. **Assignment 8. (20 points).** *Answer the questionnaire.* **Due date: Apr 07, 2011.**

### **Lecture 22-Apr 05-Week 13**

Invention vs. innovation. Can we invent & innovate in biosecurity and forensics sciences?

**Assignment 9. (20 points).** *Reading of assigned material and answer the questionnaire.* **Due date:** Apr. 12, 2011.

### **Lecture 23-Apr 07-Week 13**

7<sup>th</sup> Guest speaker. **Dr. Laurene Levy.** USDA-APHIS-PPQ. Diagnostics networks & response. US Regulatory programs and prevention, rapid response and recovery; and targeting of newly introduced pests using specific technologies. **Assignment 8 due.**

### **Lecture 24-Apr 12-Week 14**

Active and passive surveillance. Outbreak delimiting surveys. National, regional or crop surveys and seasonal considerations. Decision making in biosecurity. Simulation exercises. **Assignment 9 due.**

### **Lecture 25-Apr 14-Week 14**

Bench top simulation exercise. Students will follow up a real case of domestic relevance. The exercise will begin with a presentation related to a selected commodity and problem. Final debriefing.

**Assignment 10 (20 points)** *Bench top simulation exercise report.* **Due date: Apr 19, 2011.**

### **Lecture 26-Apr 19-Week 15**

Final review. A holistic view of all components of the biosecurity system integrated and balanced. Despite the area of specialization you decide to take, you will be interconnected within biosecurity.

**Assignment 10 due.**

### **3" examination-Apr 21-Week 15**

### **Lecture 27- Apr 26 & Lecture 28 -Apr 28-Week 16**

These are 'loose' lectures. These lectures are scheduled in this program to accommodate possible delay by inclement weather.

### **Program duration.**

Fifteen weeks program. *Last class work day is Apr 21, 2011, without any delay by inclement weather.*