

Plant Biosecurity Issues and Technologies

11:776:405 (3 credits)
Spring Semester (even years)

CONTACT INFORMATION

Instructor: Dr. Rong Di
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Office Hours: by arrangement

COURSE DESCRIPTION

This course is designed to introduce students to the plant health policies and regulations safeguarding agriculture and environmental resources, the interrelationship between risk assessment, risk management and risk communication for plant pests, and plant pest management and eradication measures. Biosecurity technologies for plant pest monitoring and detection including surveillance, bioinformatics, Lucid keys, ELISA (Enzyme-Linked Immunosorbent Assay), PCR (Polymerase Chain Reaction), and real-time PCR will be introduced accompanied by laboratory exercises. This course is designed to be a part of the Rutgers Plant Biosecurity Certificate Program that was recently established in partnership with USDA APHIS-PPQ (US Department of Agriculture, Animal and Plant Health Inspection Service-Plant Protection and Quarantine).

COURSE WEBSITE, RESOURCES AND MATERIALS

- Course website: Sakai
- Required textbook: none
- Various supplemental materials (including lectures) will be uploaded to Sakai.

PREREQUISITE

01:119:115 General Biology OR equivalent OR 11:776:242 Plant Science

COURSE LEARNING GOALS

(Link to Plant Biology Undergraduate Program Goals: <http://plantbiology.rutgers.edu/undergrad/plantbiology/>)

By the end of this course, the student will be able to:

1. Describe the USDA plant health policies and regulations safeguarding agriculture and environmental resources (addresses program goal 1)
2. Recognize the interrelationship between risk assessment, risk management and risk communication for plant pests (including both plant pathogenic microorganisms and insects), and plant pest management and eradication measures (addresses program goal 2)
3. To learn the current technologies used in plant pest identification (addresses program goal 1)
4. To appreciate the importance of agriculture and environment safeguarding measures (addresses program goal 2)

ASSIGNMENTS/RESPONSIBILITIES AND ASSESSMENT

Grading (100 points)

- Mid-term Exam: 35%
- Final Exam: 35%
- Homework: 20%
- Participation: 10%
- Scale: 90-100% = A; 80-89 = B; 70-79 = C; 60-69 = D

Learning goals assessment: Specific questions on exams will be used to assess student knowledge of all course learning goals. Students will communicate their knowledge of biosecurity risk assessment in agriculture and the environment in class discussion and homework assignments (course learning goals 2 and 4). The percentage score on these assessments will determine the level of mastery: >90% outstanding; 80-89% good; 70-70% satisfactory; <69% unsatisfactory.

PARTICIPATION GRADE AND ABSENCE POLICY

Attendance will be recorded. A maximum of 2 excusable absences are allowed. Points are deducted for each unexcused absence. Students unable to attend must contact the instructor via e-mail prior to the missed class or may use the University absence reporting website (<https://sims.rutgers.edu/ssra/>) to indicate the date and reason for the absence. An e-mail is automatically sent to the instructor.

COURSE SCHEDULE

<i>Lecture/Lab</i>	<i>Topic</i>
<i>A. Plant protection policies and regulations</i>	
1	Introduction to the course Introduction to PPQ
2	Introduction to plant protection and quarantine
3	Legislative framework and standards
4	Safeguarding and Trade: before border
5	Safeguarding and Trade: at the border <i>Homework #1 due</i>
Field trip	Visit Linden APHIS station
6	Safeguarding and Trade: post-border
<i>B. Plant pest case studies</i>	
7	Case study 1: pathogens
8	Case study 2: ALB, other insects, snails
9	Case study 4: invasive weeds
<i>C. Risk analysis</i>	
10	Risk analysis
11	Risk assessment
12	Risk management, risk communication
13	Survey theory <i>Homework #2 and #3 due</i> <i>Mid-term exam</i> <i>Spring recess</i>

<i>Lecture/Lab</i>	<i>Topic</i>
<i>D. Surveillance</i>	
14	Survey methods
Field trip	NJDA-Alampi Beneficial Insect Lab
15	CAPS, Information technology
16	Global biosecurity issues
<i>E. Biosecurity technologies</i>	
17 (lecture/lab)	Diagnostic technologies: ELISA
18	Diagnostic technologies: Lucid keys
19 (lecture/lab)	Diagnostic technologies: molecular, BLI
20	Diagnostic technologies: PCR and real-time PCR
21 (lecture/lab)	Diagnostic technologies: PCR and real-time PCR
<i>F. Pest management and eradication measures</i>	
22	Pest management
23	Biological control
<i>Final Exam (to be determined)</i>	

FINAL EXAM DATE AND TIME

The Online Final exam Schedule: <http://finalexams.rutgers.edu/>

ACCOMODATIONS FOR STUDENTS WITH DISABILITIES

Please follow the procedures outlined at <https://ods.rutgers.edu/students/registration-form>. Full policies and procedures are at <https://ods.rutgers.edu/>

ACADEMIC INTEGRITY

The university's policy on Academic Integrity is available at <http://academicintegrity.rutgers.edu>

The principles of academic integrity require that a student:

- Properly acknowledge and cite all use of the ideas, results, or words of others.
- Properly acknowledge all contributors to a given piece of work.
- Make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- Obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- Treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- Uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that:

- Everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- All student work is fairly evaluated and no student has an inappropriate advantage over others.
- The academic and ethical development of all students is fostered.

- The reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

STUDENT WELLNESS SERVICES

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.