Jordan University of Science and Technology  
Faculty of Agriculture  
Dept. of Plant Production  
Course name: Clinical Plant Pathology (Plant Disease Diagnosis)  
Course number: PP746  

Semester offered: Spring 2006/2007  
Next offering: Spring 2008/2009  
Instructor: Dr. Firas Abu-El Samen (hiasat@just.edu.jo).  
Office hours: Thursday 8-10 am or by arrangement with the instructor.  

Time and place: Thursday 10-12 am, Dept. Seminar room, and 1-5 pm (Laboratory session) Plant Pathology research laboratory.

General description and objectives:

PP746 is designed to be a practical course that emphasizes useful information for diagnosing and managing diseases of plants. Specific objectives of the course will be:

1. To provide students with a systematic approach to diagnosing plant problems in general, with a specific emphasis on plant pathogenic disease agents. Diseases and disorders of field crops, vegetable crops, fruits and nuts, ornamentals, and shade and forest trees will be covered.

2. To introduce students to modern diagnostic techniques used in the field and in the lab for both biotic disease agents and non-infectious disorders.

3. To instruct students in the basic principles of plant disease management and to provide an opportunity for students to apply learned principles to specific disease problems.

Prerequisites:

An introductory course in plant pathology such as PP441 and an introductory course in Entomology should provide sufficient background to the contents of this course.

Grading

<table>
<thead>
<tr>
<th></th>
<th>Midterm Exam (both theoretical and practical)</th>
<th>25 pt</th>
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<tbody>
<tr>
<td>2</td>
<td>Diagnostic Reports; Disease Management Reports, and Sample Collection (equivalent to second exam)</td>
<td>30 pt</td>
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<tr>
<td>3</td>
<td>Class Activities</td>
<td>20 pt</td>
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<td>4</td>
<td>Final Exam (both theoretical and practical)</td>
<td>25 pt</td>
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<td>5</td>
<td>Total</td>
<td>100</td>
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Important dates and deadlines**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Diagnostic Reports and Sample Collection</td>
<td>15/5/2007</td>
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<tr>
<td>Final Exam</td>
<td>Finals week (May 26-June 4th)</td>
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Attendance:

Students are expected to attend class. If you are absent from a class, it is your responsibility to make up any work missed. Exams and other assignments missed due to unexcused absences will be counted as zero (0). There are no make up exams regardless of the reasons for missing an exam, students who miss the exam for any reason will have to prepare a term paper or a project assigned by the instructor.
Diagnostic Reports (25pt/100):
Each student enrolled in PP746 will be required to complete diagnosis reports for 50 disease specimens. Students may collect their own specimens or use those provided by class instructors. Discussing specimens with anyone is permissible. However, I do expect each student to complete on their own documentation necessary to complete each report on each specimen. Sharing disease specimens with classmates is not permitted, but the instructor realizes many times students will bring back or find similar diseases during the semester. A diagnostic report template will be provided to students on win-word format and most portions of the report have to be typed except for drawings or images taken from the field. Students need to have a laboratory book in which information about the diagnosis procedures are recorded, portion of the Class Activities grade will be credited to this Field and Laboratory books.

Disease Management Reports (5pt/100):
Each student will be required to prepare a disease management report for 2 important diseases that were diagnosed during the lab session or in a field trip, the disease management report is somewhat similar to an extension bulletin (2-3 pages long), in which an integrated approach for management of a certain disease is presented. Each student is required to present at least one disease management report to the class as a mini-talk (10-15 min presentation on power point format).

Class Activities evaluation procedure (20pt/100):
During this class students will be asked to perform many assignments and activities, many of these assignments are individual and some are team work, I will keep a record of such activities and students’ grades will be assigned based on their contribution to the class activities. Examples of such activities include, but not limited to:

• Bringing samples for the class to diagnosis.
• Processing samples for long-term storage.
• Preparation of growth media for the class.
• Organizing visits to farms and orchards for the purpose of collecting disease samples.
• Literature collection for identification of pathogenic organisms.
• Preparation of permanent microscopic slides, growing plants in the green house for pathogenicity testing etc.,
• Preparation of mini-talks and presentations about diseases of specific importance.
• Enriching the digital media library of this class with high quality images taken by you or downloaded from the internet.
• Attendance of all lectures, lab sessions and field trips (note: you will lose some points if you miss a class period, lab session or a field trip regardless of the legitimate reason for missing any activity.)

Text book
None is required, however many books and journal articles are going to be used. I have listed some useful references for students as reference materials (some are required readings). Class notes will be delivered as power point presentations and will be provided to students after each class as a PDF file attachment to an e-mail message from the instructor; please watch your e-mail for required and suggested readings.
<table>
<thead>
<tr>
<th>No</th>
<th>Topic</th>
<th>Contents</th>
<th>Required readings</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Plant Disease Diagnosis</td>
<td>The art and science of plant disease diagnosis; reasons for diagnosing plant diseases, concepts in diagnosing plant diseases, steps in diagnosing a plant disease</td>
<td>• Shurtleff and Averre, 1997, Chapter 1 (pages 1-5).</td>
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<tr>
<td>2</td>
<td>The Plant Disease Clinic</td>
<td>Equipments and Supplies, field Clinics.</td>
<td>• Shurtleff and Averre, 1997, Chapter 2 (pages 7-36).</td>
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<tr>
<td>4</td>
<td>Diagnosing in the Field</td>
<td>Symptoms and signs to look for when diagnosing a plant disorder, integration of information, hypothesis formulation and hypothesis testing.</td>
<td>• Shurtleff and Averre, 1997. Chapter 4 (47-97)</td>
</tr>
<tr>
<td>5</td>
<td>Diagnosing in the Clinic</td>
<td></td>
<td>• Martin et al., 2002. IMPACTS OFMOLECULAR DIAGNOSTIC TECHNOLOGIES ON PLANT DISEASE MANAGEMENT. Annu. Rev. Phytopathol. 2000. 38:207-39</td>
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</tbody>
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Disease Diagnosis of Vegetable crops
Diagnosing diseases of tomato, cucurbits, pepper, eggplants, beans, lettuce, cauliflower, cabbage, potato, onion and garlic, etc.,
Field trip (Using compendiums and field guides)

Disease Diagnosis of Field crops
Diagnosing diseases of wheat, barley, chickpea, lentil etc.,
Field trip (Using compendiums and field guides)

Disease Diagnosis of Deciduous Fruit trees
Diagnosing diseases of pome fruits, stone fruits, grapes
Field trip (Using compendiums and field guides)

Disease Diagnosis of evergreen Fruit trees
Diagnosing diseases of Citrus and olives.
Field trip (Using compendiums and field guides)

Presentation of Disease Management reports by students

***Arrangement of class topics is not fixed and subject to change depending on the laboratory work and field trips. A schedule of field trips will be provided to students two weeks ahead.

Suggested references and readings Materials:
(Most of these books are available from the university library or can be borrowed from my office)

Books

2. **Wallwork, H (ed).** Cereal leaf and stem diseases. Published by Grains Research and Development Corporation, Australia, 102pp.


Journal Articles


32. **Michailides, 2005.** Conventional and molecular assays aid diagnosis of crop diseases and fungicide resistance, California Agriculture Vol 59 (2): 115-123.

33. **Stewart, T. M. 2004.** Teaching the art and science of plant disease diagnosis: Training students with DIAGNOSIS for CROP PROBLEMS. The Plant Health Instructor. DOI:10.1094/PHI-T-2004-0426-01.


