The University of Jordan Department: Plant Protection

Faculty: Agriculture 2013/2014, Second semester.

Advanced Plant Fungal Diseases, Course No. (606761)

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| Credit hours | 3  | Level | Graduate | Pre-requisite | 0636221 |
| Coordinator/ Lecturer | Prof. Dr.Ahmad Mohamad Almomany | Officenumber | 258 | Office phone | 22513 |
| Course website | none | E-mail | momanyah@ju.edu.jo | Place | Seminar room |

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| Office hours |
| Day/Time | Sunday | Monday | Tuesday | Wednesday | Thursday |
|  | 11-12 | 11-12 | 11-12 | 11-12 | 11-12 |

Course Description

This course deals with the study of fungal diseases (Damping-off, root rots, wilt diseases, powdery and downy mildew, leaf spots, blight diseases, anthracnose, cankers, rusts and smuts. Studies including their causal agents, symptoms, environmental factors affecting their development and dissemination and their control. Students will be exposed to recent relevant research topics.

Learning Objectives

The main objectives of the course are:

1-Understanding the components of disease pyramid

2-Understand the importance of breeding for plant disease resistance

3-Understand the quarantine principles.

4-Understand the art of disease management

5-Use knowledge of pathogen biology and epidemiology to develop reasonable hypotheses about effective long and short term control strategies for fungal pathogens.

Intended Learning Outcomes (ILOs):

Successful completion of the course should lead to the following outcomes:

Intended Learning Outcomes:

At the end of the course the students will be able to:

1-Realise the different components of disease development.

2- Know the pathological responses

3-Know the advanced topics related to epidemiology and disease forecasting

4- Know the importance of breeding for plant disease resistance

A. Knowledge and Understanding: Student is expected to

A1- Be familiar with symptomatology, epidemiology and modes of infection

A2- Be familiar with identification of fungal diseases.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1- Know the physiological interaction between fungus and diseased plant.

B2 Know the Control measures of plant diseases.

C. Subject-Specific Skills:

C1-At the end of the course, the students are expected to gain skills about disease symptoms, crop loss assessment and disease diagnosis.

C2-Undestand the concept of defensive mechanisms in plants.

C3-How to apply and use an integrated pest management program to control plant disease safely.

C4- Construct programs of protected agriculture.

C5--At the end of the course, the students are expected to gain skills about disease symptoms, crop loss assessment and disease diagnosis.

D. Transferable Key Skills: Students is expected to

D1- To be able to formulate integrated pest program.

D2- How to apply and use an integrated pest management program to control plant disease safely.

ILOs: Learning and Evaluation Methods

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| ILO/s | Learning Methods | Evaluation Methods |
|  | Lectures and Discussions | Exam and lab reports |

Class Attendance & Participation: Participation is a vital part of both the course experience and the course grade. Students will be expected to arrive at each class on time and prepared to fully participate in the lecture, lab, or other class activities

* Midterm Exam 15/4/2014. No makeup exams. Zero for absent students. Do not lose our confidence with you. Do not cheat in the exam otherwise you will lose your mark.

Course Contents

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| --- | --- | --- | --- |
| Content | Reference | Week | ILO/s |
| Introduction | 1 | 1 | A1, A2, B1 |
| Review of disease cycles of some fungal diseases. | 1, 2, 16 | 2 | B2 |
| Fungal diseases of quarantine significance, fungal diseases in the nursery. | 1, 4 | 3 | B2, C1, C2 |
| • Mycorrhizae• Epiphytes & Endophytes• Biotrophs, hemibiotrophs, and necrotrophs | 1, 12, 15 | 4 | B1, C2,  |
| Seed transmitted fungal diseases | 1, 5 | 5+6 | A1, A2, B2, C3, D1 |
| Fungal Mycotoxins | 1, 11, 17 | 7 | B1, C2 |
| Mechanism of action of fungicides, How Pathogens become resistant to fungicides | 1,3 ,9 | 8 | B1, B2, C2 |
| The theory of disease management, Management of the environment. Ornamentals & Forest Diseases | 1,9  | 9 | A1, B2, C1, C3, D1, D2 |
| Management of the associated micro biota, therapy by heat and radiation | 1,2 ,3 | 10 | B1, B2, C4 |
| Disease forecasting, Pathometry, Fungal mycotoxins | 1, 3, 5 | 11+12 | A1, B1, B2, C3, C4 |
| Chemical control of post-harvest diseases | 1, 7, 8, 10 | 13+14 | B1, B2, C1, C5 |
| Selected articles from annual review of phytopathology. | 13, 14 | 15 | D1, D2 |
| Final exam | - | 16 | Assigned from registration department |

Teaching Methods:

1- Lectures. 2 –Reports 3. Assignments (presentation)

Projects and Assignments

Lab work and sample collections. Seminars by individual students to encourage developing skills of self-expression. Teaching tools: Data show and case study.

Evaluation

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| --- | --- | --- |
| Evaluation | Point % | Date |
| First exam  | 20 | 15/4/2014 |
| Second exam  | 20 | Assigned later |
| Presentation and Reports 20% | 20 |  |
| Final Exam | 40 | As it is Scheduled by Registration Department |

Main Reference/s:

1-Horsfall, J. and Cowling E. (1977). Plant disease, An advanced treatise Vol. 1&2&3 .Academic Press.

# References:

2-Byrde, P. and Cutting C. (1993). Fungal pathogenicity and the plant’s response. Academic Press.

3-Holiday, P. (1980) Fungus diseases of tropical crops. Cambridge University Press.

4-Kotheker, A. (1970). Handbook of pests , diseases and weeds of quarantine significance. Translated from Russian.

5-Kiraly, Z. (1977). Curent topics in plant pathology, Budapest, Proceedings of a symposium.

6-Avery, R (1983). Potato diseases. Academic Press, London.

7-Annual Review of Plant Pathology.

8-Journal of Phytopathology.

9-William, F. (1985). Principles of plant disease management. Academic Press. London.

10-Journal of new phytologist.

11- Jaroszuk‐Scisel, J., E. Kurek, A. Slomka, M. Janczarek, and B. Rodzik. 2011. Activities of cell wall degrading enzymes in autolyzing cultures of three *Fusarium culmorum* isolates: growth promoting, deleterious and pathogenic to rye (*Secale cereale*). *Mycologia*. 103:929–945.

12-Johnson, N.C., J.‐H. Graham, and F.A. Smith. 2008. Functioning of mycorrhizal associations along the mutualism–parasitism continuum. *New Phytologist*. 135:575–585.

13-Kroon, L.P.N.M., H. Brouwer, A.W.A.M. de Cock, and F. Govers. 2012. The genus *Phytophthora* anno 2012. *Phytopathology*. 102:348–364.

14-Kv, S., K. St, and H. Jc. 1996. Effects of deep plowing on the distribution and density of Sclerotinia *minor* sclerotia and lettuce drop incidence. *Plant disease*. 80:28.

15-Redman, R.S., D.D. Dunigan, and R.J. Rodriguez. 2001. Fungal symbiosis from mutualism to parasitism: who controls the outcome, host or invader? *New Phytologist*. 151:705–716.

16-Rossman, A.Y., and M.E. Palm‐Hernandez. 2008. Systematics of Plant Pathogenic Fungi: Why It Matters. *Plant Disease*. 92:1376–1386.

17- Thomma, B.P.H.J. 2003. *Alternaria* spp.: from general saprophyte to specific parasite. *Molecular Plant Pathology*. 4:225–236.

**Intended Grading Scale (Optional)**

0-39 **F**

40-49 **D**-

50-54 **D**

55-59 **D+**

60-64 **C**-

65-69 **C**

70-73 **C+**

74-76 **B**-

77-80 **B**

81-84 **B+**

85-89 **A**-

90-100 **A**

**Notes:**

* Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For final complaints, there will be a committee to review grading the final exam.
* For more details on University regulations please visit:

 <http://www.ju.edu.jo/rules/index.htm>