Course Specifications

Revised November 2019

Course Title:	**Plant pathology and disease control**
Course Code:	**4013441 -3**
Program:	**BSc Microbiology**
Department:	**Department of Biology**
College:	**Faculty of Applied Science – Department of Biology**
Institution:	**UM AL – QURA UNIVERSITY**
Revision Date	**November 2019**

Table of Contents

A. Course Identification

1. Credit hours: 3 hours
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ■ Elective ☐
3. Level/year at which this course is offered: 3rd Year / Level 5
4. Pre-requisites for this course (if any): Virology 4012412-2 / Bacteriology 4012422-3 / Mycology 4012432-3
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	30	50 %
2	**Blended**		-
3	**E-learning**		-
4	**Correspondence**		-
5	**Other**	30	50 %

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	42
3	**Tutorial**	-
4	Practical/Field work/Internship	6
5	**Others** (specify)	30
	Total	102
Other Learning Hours*		
1	**Study**	30
2	**Assignments**	8
3	**Library**	15
4	**Projects/Research Essays/Theses**	10
5	**Others** (specify)	-
	Total	63

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

The course of Plant Pathology and Control is designed to identify the different causes of plant diseases and symptoms that appear on plants as a result of infection. Also, the course will show the students different infectious causes of plant diseases such as fungal, bacterial, viral and nematode plant diseases. In addition to that, Plant Ppathology and Control course will describe how the environment can affect the disease severity and different methods of disease control.

2. Course Main Objective

- After completing this course student should be able to:
  - Identify and list the causes of plant diseases.
  - Discuss the ability of pathogen to distribute in nature
  - Describe how the pathogen can penetrate into the host
  - Recognize how the pathogen can overcomes the unfavorable environmental conditions
  - List the different ways of pathogen reproduction.
  - Recognize the various symptoms in diseased plants.
  - Describe the plant diseases caused by fungi and their control.
  - List some examples of bacterial plant diseases
  - State the viral diseases and their important symptoms.
  - Summarize the way of distribution of plant diseases caused by viruses
  - Discuss the plant diseases caused by nematodes.
  - List the effect of environmental conditions on severity of plant diseases
  - Summarize the different methods of plant diseases control

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
	Upon successful completion of this course The student will be able to: • Identify the causes of plant diseases. • List the different causes of plant diseases. • Discuss the ability of pathogen to distribute in nature • Describe how the pathogen can penetrate into the host • Recognize how the pathogen can overcomes the unfavorable environmental conditions • List the different ways of pathogen reproduction. • Recognize the various symptoms in diseased plants. • Describe the plant diseases caused by fungi and their control. • List some examples of bacterial plant diseases • State the viral diseases and their important symptoms. • Summarize the way of distribution of plant diseases caused by viruses • Discuss the plant diseases caused by nematodes. • List the effect of environmental conditions on severity of plant diseases. • Summarize the different methods of plant diseases control.	
2	**Skills:**	
2.1	**Cognitive skills to be developed**	

	CLOs	Aligned PLOs
	Having successfully completed the course students should be able to: • Summarize the different causes of plant diseases. • Compare between infectious and non- infectious diseases. • Describe penetration ways of pathogen into the host. • Explain the ways that enable the pathogen to overcome unfavorable conditions • Summarize the different ways of pathogen reproduction. • Differentiate between the various symptoms in diseased plants • Diagram some fungal genera causing downy mildews • Differentiate between fungal genera causing powdery mildews. • Compose some examples of bacterial plant diseases • Explain the viral diseases and their important symptoms. • Write the ways of distribution of plant diseases caused by viruses • Justify nematodes and plant diseases • Summarize the environmental conditions affecting the severity of plant diseases • Diagram the studied basidiomycetes genera • Design the methods of disease control.	
2.4.	**Psychomotor Skills** Upon successful completion of this course, the student is expected to be able to: • Perform the laboratory experiments precisely • Operate all devices in lab • Prepare of student skills to use microscope • Enhancement of student ability to use light microscope in accuracy. • Prepare culture media, the ways of isolation and purification of fungi cultures.	
3	**Competence:**	
3.1	Upon successful completion of this course, the student is expected to be able to: • Developing oral presentations. • Communicating personal ideas and thoughts. • Work independently and as part of a team to finish some assignments. • Communicate results of work to others. • Use of needed precautions when dealing with plant pathogen microorganisms • Demonstrate professional attitudes and behaviors towards others. • Propose the smart questions • Understand and dissecting the problem so that it is fully solved understood. • Demonstrate the assertiveness for his decision. • Demonstrate his capability for the responsibility and Accountability • Show Effective verbal communication with clarity and must be characterize with the following interpersonal attributes; (verbal communication, non-verbal communication, good listening for the others, questioning, good manners, problem solving, social awareness, self-management, responsibility and accountability). • Enhancing the ability of students to use computers and internet.	

CLOs		Aligned PLOs
	• Interpret the laboratory data. • Know how to write a report.	

C. Course Content

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
Introduction: - Causes of plant diseases – Infectious plant diseases – Non-infectious plant diseases	**1**	**2**
Characters of virulent pathogen: - the ability of pathogen to reproduce. - the ability of pathogen to distribute. – the ability of pathogen to penetrate the hosts – the ability of pathogen to overcomes the unfavorable environmental conditions	**1**	**2**
Causes of plant diseases: - Infectious causes of plant diseases: fungi, bacteria, nematodes - Viral plant diseases - Non-infectious plant diseases : temperature, humidity, minerals, pH number…	**1**	**2**
- Symptoms: - Chlorosis or discoloration - Necrosis - Galls and stunting - Damping off - Wilt	**1**	**2**
- Plant diseases caused by fungi: - Downy mildews and symptoms - the symptoms of the disease - Fungi causing the disease, life cycle of one example - Factors affecting the disease severity - Disease control	**1**	**2**
- Plant diseases caused by fungi (continued): - Powdery mildews - the symptoms of the disease - Fungi causing the disease, life cycle of one example - Factors affecting the disease severity - Disease control	**1**	**2**
- Plant diseases caused by fungi (continued): - Damping off and seedling blight- the symptoms of the disease -Early and late blight - Fungi causing the disease, life cycle of one example - Factors affecting the disease severity - Disease control	**1**	**2**
Plant diseases caused by fungi (continued): - Wilts- the symptoms of the disease - Vascular wilts caused by fungi - Fungal genera causing the disease - Bacterial vascular wilts - Disease control	**1**	**2**
- Plant diseases caused by fungi (continued): - Rusts and smuts- the symptoms of the disease - Fungi causing the diseases, life cycle of one example for each - Factors affecting the disease severity - Disease control	**1**	**2**

- Plant diseases caused by bacteria (continued): - Fire blight of pear and apple - the symptoms of the disease - bacteria causing the diseases. - Factors affecting the disease severity - Disease control	**1**	**2**
- Plant diseases caused by bacteria (continued): - Leaf spots- the symptoms of the diseases - Bacterial and fungal leaf spots - Angular spots, brown spots, leaf spots of tomato and potato - Factors affecting the disease severity. - Disease control**.**	**1**	**2**
- Plant diseases caused by bacteria (continued): - Bacterial soft rots - Factors affecting the disease severity. - Disease control. - Viral diseases	**1**	**2**
- Viral diseases (continued): - Symptoms of viral diseases. - Different ways of viral diseases distribution - Viral diseases control**.**	**1**	**2**
- Fungal classification (continued): - Plant diseases caused by nematodes - Root knot disease, symptoms and the disease control - Environmental factors affecting infectious diseases severity	**1**	**2**
	14 weeks	**28 hours**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	❖ Upon successful completion of this course The student will be able to: • Identify the causes of plant diseases. • List the different causes of plant diseases. • Discuss the ability of pathogen to distribute in nature • Describe how the pathogen can penetrate into the host • Recognize how the pathogen can overcomes the unfavorable environmental conditions • List the different ways of pathogen reproduction. • Recognize the various symptoms in diseased plants. • Describe the plant diseases caused by fungi and their control. • List some examples of bacterial plant diseases • State the viral diseases and their important symptoms. • Summarize the way of distribution	• Lectures which must start with preliminary one showing course contents. • Using images and movies. • Encouraging student to identify different symptoms of plant diseases. • Enable the reference books and scientific sites concerning plant pathology in internet. • All students will be involved in on-line learning process and each student is required to create an E-mail address to facilitate student web interactions	• Periodical exam and reports 10% • Mid- term theoretical exam 20% • Mid-term practical exam 5% • Final practical exam 15% • Final exam 50%

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	of plant diseases caused by viruses • Discuss the plant diseases caused by nematodes. • List the effect of environmental conditions on severity of plant diseases. • Summarize the different methods of plant diseases control.		
2.0	**Skills**		
2.1	**Cognitive skills** ❖ Having successfully completed the course students should be able to: • Summarize the different causes of plant diseases. • Compare between infectious and non- infectious diseases. • Describe penetration ways of pathogen into the host. • Explain the ways that enable the pathogen to overcome unfavorable conditions • Summarize the different ways of pathogen reproduction. • Differentiate between the various symptoms in diseased plants • Diagram some fungal genera causing downy mildews • Differentiate between fungal genera causing powdery mildews. • Compose some examples of bacterial plant diseases • Explain the viral diseases and their important symptoms. • Write the ways of distribution of plant diseases caused by viruses • Justify nematodes and plant diseases • Summarize the environmental conditions affecting the severity of plant diseases • Diagram the studied basidiomycetes genera. • Design the methods of disease control.	• Lectures. • Brain storming. • Discussion.	• Exam must contain questions that can measure these skills. • Quiz and exams. • Discussions after the lecture.
2.2	**Psychomotor Skills** ❖ Upon successful completion of this course, the student is expected to be able to:	• Follow up students during preparing slides, media and examination of	• Giving additional marks for the students they have accurate

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	• Perform the laboratory experiments precisely • Operate all devices in lab • Prepare of student skills to use microscope • Enhancement of student ability to use light microscope in accuracy. • Prepare culture media, the ways of isolation and purification of fungi cultures.	diseased specimens	laboratory results and good seminar presentation • Practical exam.
3.0	**Competence**		
3.1	❖ Upon successful completion of this course, the student is expected to be able to: • Developing oral presentations. • Communicating personal ideas and thoughts. • Work independently and as part of a team to finish some assignments. • Communicate results of work to others. • Use of needed precautions when dealing with pathogen microorganisms • demonstrate professional attitudes and behaviors towards others. • propose the smart questions • understand and dissecting the problem so that it is fully solved understood. • Demonstrate the assertiveness for his decision. • Demonstrate his capability for the responsibility and Accountability • show Effective verbal communication with clarity and must be characterize with the following interpersonal attributes; (verbal communication, non-verbal communication, good listening for the others, questioning, good manners, problem solving, social awareness, self-management, responsibility and accountability). • Enhancing the ability of students to use computers and internet. • Interpret the laboratory data. • Know how to write a report.	• Lab work • Case Study • Active learning • Small group discussion • Homework (preparing a report on some topics related to the course depending on web sites). • Seminars presentation • Practical during carryout the experiments in the lab.	• Oral exams. • Evaluate the efforts of each student in preparing the report. • Evaluate the scientific values of reports. • Evaluate the work in team • Evaluation of the role of each student in lab group assignment • Evaluation of students presentations

2. Assessment Tasks for Students

5. Schedule of Assessment Tasks for Students During the Semester				
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Exam duration	Proportion of Final Assessment
1	**Periodical Exam (s)**	**4**	**15 min**	**10 %**
2	**Mid Term Exam (Theoretic)**	**8**	**60 min**	**20 %**
3	**Mid Term Exam (practical)**	**9**	**30 min**	**10 %**
4	**Reports and essay**	**11**	**--**	**5 %**
5	**Final Practical Exam**	**15**	**60 min**	**15 %**
6	**Final Exam**	**16**	**120 min**	**40 %**
Total Marks				**100%**

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Office hours: 10hrs.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Course note prepared by faculty member responsible for the course: Prof. Dr. Ahmed Yehya Abdel-Mallek Prof. Dr. Khaled Elbanna
Essential References Materials	• Plant Pathology (1986) Mahmoud Maher, Mostafa Mohamed Faheem, Yousef Abdelhamed Abdo, AlSayed Ahmed Salama • Plant Diseases (1999) David Ingram, N. F. Robertson. Harper Collins Publisher. • Plant Pathology (2005) George Nicolas Agrios. Elsevier Science Publishing Co Inc.
Electronic Materials	• https://en.wikipedia.org/wiki/Plant_pathology • https://en.wikipedia.org/wiki/Phytophthora_infestans
Other Learning Materials	**PPT prepared by** Prof. Dr. Prof. Dr. Khaled Elbanna

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration	• Class room is already provided with data show • The area of class room is suitable concerning the

Item	Resources
rooms/labs, etc.)	number of enrolled students (68) and air conditioned
Technology Resources (AV, data show, Smart Board, software, etc.)	• Digital lab containing 15 computers.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	• Incubators, autoclaves, measuring equipment, water bath, digital balances, pH meters, safety facilities. • Availability of some reference fungal and bacterial pathogen strains • Different media • All chemicals and reagents needed • Availability all fungi and bacterial slides

G. Course Quality Evaluation

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Questionaries • Open discussion in the class room at the end of the lectures.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department • Revision of student answer paper by another staff member. • Analysis the grades of students.
3. Processes for Improvement of Teaching • Preparing the course as PPT. • Using scientific movies. • Coupling the theoretical part with laboratory part • Periodical revision of course content.
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution) • After the agreement of Department and Faculty administrations
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Periodical revision by Quality Assurance Units in the Department and institution

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Prepared by faculty staff: **1. Prof. Dr. Khaled Elbanna**	**Signature:**
Date Report Completed: November 2019	
Revised by: 1. Dr. Khaled Elbanna 2. Dr. Hussein H. Abulreesh 3. Dr. Shady Elshahawy	**Signature:**
Date: November **2019**	

Program Chair Dr. Hussein H. Abulreesh	**Signature:**
Dean	**Signature:**
Date:	