Course (NH02038): GENERAL PLANT PATHOLOGY

1. General Information

- Semester: 3
- Credits: **Total 2 (Theory: 1.5 – Practice: 0.5**
- **Self-study: 6 credits**
- Credit hours
  - Theory: 22.5
  - Lab work: 7.5
  - Self-study*:* 90
- Department conducting the course:
  - Department: Plant pathology
  - Faculty: Agronomy
- Kind of the course

Foundation □		Fundamental ☒		Option 1 □		Option 2 □	
Compulsory □	Elective □	Compulsory ☒	Elective □	Compulsory □	Elective □	Compulsory □	Elective □

  - Preceding course: None

2. Course objectives and expected learning outcomes

**** Course objectives***:

- Knowledge: Course provided for students with knowledge in principal concepts of plant pathology related to pathogenesis, characteristics of groups of plant pathogens, plant disease epidemics, diagnosis and disease control.

- Skills: Course provided for students with skills in diagnose of plant diseases

- Attitude: Course provided for students with attitude in maintaining professional ethics and environmental protection responsibilities.

**** Course expected learning outcomes***

Notation	**Course expected learning outcomes** After successfully completing this course, students are able to	**PLO performance criteria**
Knowledge		
CELO1	Describe and explain the basic concepts of phytopathology	1.2, 2.1, 2.2, 3.4
CELO2	Apply the appropriate approach to manage particular plant diseases	1.2, 2.1, 2.2, 3.4
Skills		
CELO3	Search and exploit information of topics related to plant diseases from the internet sources	1.2, 2.1, 2.2, 3.4
CELO4	Perform exactly diagnosis of plant diseases based on symptoms and signs	1.2, 2.1, 2.2, 3.4
Attitude		
CELO5	Maintain professional ethics and environmental protection responsibilities.	9.2

3. Course description

Theory: Basic concepts in plant diseases (plant diseases, plant pathogens, plant disease epidemics, disease control and diagnosis); Common characteristics of the major plant pathogens include fungi, bacteria, viruses, and nematodes; Major diseases of food crops, fruit crops, vegetable crops and industrial crops). ***Lab works***: Basic techniques in the diagnosis of plant diseases caused by fungi, bacteria, viruses and nematodes.

4. Teaching and learning & assessment methods

CELOs	CELO1	CELO2	CELO3	CELO4	CELO5
Teaching and learning					
Lecturing	x	x	X	x	x
Lab working	x		X	x	
Discussion	x	x	X	x	
Using electronic visuallization materials	x	x	X	x	
Assessment					
Rubric 1. Participation/attitude (10%)					X
Rubric 2. Lab work report (15%)				x	
Rubric 3. Midterm exam (15%)		x	X		
Rubric 4 Final exam (60%)	X	x	X	x	

5. Student tasks

+ Theory/attendance (following the University regulation)
+ Lab work (required)
+ Midterm exam (required)
+ Final exam (required)

6. Text books and references

**** Text Books/Lecture Notes:***

1. Ha Viet Cuong (2009). Lecture notes of general plant pathology for horticulture and landscape design (in Vietnamese)
2. Vu Trieu Man (ed.) (2007). Genaral plant pathology – text book. Agriculture Publishing House.

**** Additional references:***

- Agrios, G. N. (2005). Plant pathology. Elsevier.

7. Course outline

Week	Content	CELOs
1	**Lecture 1: Introduction**	
	A/ Main contents*: (7.5 hour)* **Theory (3 hrs)** ***History*** Importance Phytopathology fields Definition Symptoms and signs Groups of pathogens	CELO1, 2, 3, 4, 5

	Abiotic diseases **Lab work (***5 hrs)* ***Lab work 1:*** Symptoms and signs	
	B/ Self-stydy: *(6 hrs)* Classification of plant diseases Classification of pathogens Pathogenicity and virulency	CELO1, 2, 3, 4, 5
2	**Lecture 2. Pathogenesis**	
	A/ Main contents*: (3 hrs)* **Theory:** ***Pathogenesis (mechanisms) of groups*** Fungi Bacteria Viruses Nematodes ***Effect of disease on physiological functions of plant*** Photosynthesis Respiration Water translocation Phytohormone balance	CELO1, 2, 3, 4, 5
	B/ Self-study: *(6 hrs)* ***Pathogenesis (mechanisms) of groups*** Fastidious bacteria Phytoplasma Viroid ***Effect of disease on physiological functions of plant*** Cell mambrane permeability Biến đổi sự thoát hơi nước qua bề mặt lá Assimilate transport Nitrous and carbohydrate metabolism	CELO1, 2, 3, 4, 5
3	**Lecture 3. Plant epidemiology**	
	A/* Main contents: (9 hrs)*** **Theory (3 hrs)** Disease triangle Infection (life) cycle Disease cycle Type of plant epidemics	CELO1, 2, 3, 4, 5
	B/* Self-study**: *(6 hrs)* ***Components of disease cycle Pathogen Environment Host	CELO1, 2, 3, 4, 5
4	**Lecture 4. Diagnosis and control of plant diseases**	
	A/* Main contents: (3 hrs)*** **Theory (3 hrs)** ***Diagnosis*** - Based on symptoms - Based on signs - Koch pustulate Molecular diagnosis	CELO1, 2, 3, 4, 5

	Control Chemical Biological	
	B/* Self-study**: *(6 hrs)* ***Diagnosis Inoculation ***Control*** Cultivated Physical	CELO1, 2, 3, 4, 5
5	**Lecture 5. Fungi and fugal diseases**	
	A/* Main contents: (7.5 hrs)*** **Theory (3 hrs)** General characteristics of fungal pathogens Reproduction, classification of plant fungi Pathogenesis Diseases caused by fungus-like microorganisms Diseases caused by ascomycestes fungi Diseases caused by basidiomycetes fungi **Lab work (***5 hrs***)** ***Lab work 2: Fungal diseases*** Morphological characteristics Symptoms of fungal diseases	CELO1, 2, 3, 4, 5
	B/* Self-study**: *(6 hrs)* ***Examples of fungal diseases (representative for taxonomic groups of fungi, having economical importance in Vietnam, or demonstrating basic concepts) Fusarium wilt of tomato (Fusarium) Southern blight (Sclerotium) Downy mildew of soybean (Peronospora) Late blight of potato and tomato (Phytophthora) Gummosis of citrus (Phytophthora) Smut of corn (Ustilago) Rust of corn (Puccinia) Southern/northern corn leaf blight (Bipolaris/Excerohilum) Sheath blight of rice/corn, crown rot of crops (Rhizoctonia) Bakanae of rice (Fusarium) Blast of rice (Pyricularia) Anthracnose of chilli/mango/papaya (Colletotrichum) Powdery mildew of cucurbits (Oidium) Late leaf spot of groundnut (Cercospora)	CELO1, 2, 3, 4, 5
6	**Lecture 6. Bacteria and bacterial diseases**	
	A/* Main contents: (4.5 hrs)*** **Theory (3 hrs)** General characteristics of plant bacteria Biological characteristics of plant bacteria Taxonomy of plant bacteria Pathogenesis of plant bacteria Control of plant bacteria **Lab work (***2 hrs***)** ***Lab work 3: Bacterial, viral and nematode diseases*** Morphological characteristics Symptoms of bacterial diseases	CELO1, 2, 3, 4, 5

	B/* Self-study**: *(6 hrs)* ***Examples of bacterial diseases (representative for taxonomic groups of bacteria, having economical importance in Vietnam, or demonstrating basic concepts) Huanglongbing of citrus (CLas) Bacterial wilt of solanaceous crops (Ralstonia) Soft rot (Pectobacterium) Bacterial leaf blight of rice (Xanthomonas) Gall (Agrobacterium) White leaf disease of sugarcane (SCWL)	CELO1, 2, 3, 4, 5
7	**Lecture 7. Viruses and viral diseases**	
	A/* Main contents: (4.5 hrs)* **Theory (3 hrs)** General characteristics of plant viruses Transmission of plant viruses Taxonomy and nomenclature of plant viruses Pathogenesis of plant viruses Control of plant viruses **Lab work (2** *hrs* **)** ***Lab work 3: Bacterial, viral and nematode diseases*** Symptoms of viral diseases	CELO1, 2, 3, 4, 5
	B/* Self-study**: *(6 hrs)* ***Examples of viral diseases (representative for taxonomic groups of viruses, having economical importance in Vietnam, or demonstrating basic concepts) Yellow leaf curl disease of tomato (begomovirus) Yellow mosaic disease of pumpkin (SLCCNV) Bunchy top disease of banana (BBTV) Yellow stunt disease of rice (RYSV) Ringspot/mosaic diseases of papaya/cucurbit (PRSV)	CELO1, 2, 3, 4, 5
8	**Lecture 8. Nematodes and nematode diseases**	
	A/* Main contents: (4.5 hrs)* **Theory (3 hrs)** General characteristics of plant nematodes Biological characteristics of plant nematodes Taxonomy of plant nematodes Pathogenesis of plant nematodes Control of plant nematodes **Lab work (1** *hrs* **)** ***Lab work 3: Bacterial, viral and nematode diseases*** Morphology of plant nematodes Symptoms of nematode diseases	CELO1, 2, 3, 4, 5
	B/* Self-study**: *(6 hrs)* ***Examples of nematode diseases (representative for taxonomic groups of plant nematodes, having economical importance in Vietnam, or demonstrating basic concepts) Root knot disease (Meloidogyne) Burrowing nematode (Radopholus) Root lesion disease (Pratylenchus) White tip disease of rice (Aphelenchoides)	CELO1, 2, 3, 4, 5

Hanoi, ...

HEAD OF DEPARTMENT **(Full name and signature)**	**LECTURER** **(Full name and signature)**
	Ha Viet Cuong
DEAN OF FACULTY **(Full name and signature)**	**PRESIDENT** **(Full name and signature)**