PLPA - PLANT PATHOLOGY

PLPA 601 Fundamentals of Plant Pathology
Credits 3. 3 Lecture Hours.
Increase the understanding of the underlying mechanisms in the disease process; apply that understanding to reduce losses caused by disease; nature of disease causing agents; the outcomes of the interaction between plants and pathogens.
Prerequisite: Graduate classification.

PLPA 603 Plant Disease Management
Credits 3. 3 Lecture Hours.
Online course designed to provide a strong foundation in the principles and practices of management of plant diseases; analysis of disease cycles and epidemiological parameters to develop and evaluate efficient control strategies and forecasting models.
Prerequisites: PLPA 301 or equivalent, approval of instructor.

PLPA 604 Plant Bacterial Diseases
Credit 1. 1 Lecture Hour.
Bacterial diseases of fruit and vegetable crops, field crops and ornamental plants; structure and function of plant pathogenic bacteria; dissemination of bacterial pathogens and methods of control.
Prerequisite: PLPA 301 or PLPA 601.

PLPA 605 Molecular Plant Virology
Credit 1. 1 Lecture Hour.
Focus on biology and molecular genetics of plant viruses; historical information and recent developments discussed to illustrate how viruses establish an infection; control measures presented, uses as tools in biotechnology.
Prerequisite: PLPA 301 or PLPA 601.

PLPA 606 Fungal Biology
Credit 1. 1 Lecture Hour.
Morphological and molecular systematic survey of kingdom of Fungi; emphasis on modern concepts and disease control.
Prerequisite: PLPA 301 or PLPA 601.

PLPA 607 Pathogen Strategies
Credit 1. 1 Lecture Hour.
Molecular mechanisms that pathogens use to overcome innate immunity of the host plant; molecular events associated with the disease cycles of pathogens; pathogen-host-coevolution; pathogen virulence factors; pathogen countermeasures to plant defense mechanisms.
Prerequisites: PLPA 301 or PLPA 601.

PLPA 608 Pathogen Perception and Signaling
Credit 1. 1 Lecture Hour.
Molecular and biochemical basis of pathogen recognition; pathogen signaling initiation and transduction in hosts.
Prerequisite: PLPA 301 or PLPA 601.

PLPA 609 Defense Hormone Signals
Credit 1. 1 Lecture Hour.
Molecular and biochemical mechanisms of plant hormone-mediated defense responses to pathogen invasion; major classes of defense-related proteins, phytoalexins and antibacterial secondary metabolites and signal transduction pathways.
Prerequisite: PLPA 301 or PLPA 601.

PLPA 610 Host Plant Resistance
Credits 3. 3 Lecture Hours.
Host plant resistance programs from the standpoint of the plant breeder, plant pathologist and entomologist; team taught with each discipline represented; roundtable discussions of assigned readings and lectures.
Prerequisite: Approval of instructor.
Cross Listing: SCSC 610 and ENTO 610.

PLPA 611 Advanced Plant Pathology
Credits 3. 3 Lecture Hours.
Principles and concepts of plant pathogenesis, plant disease epidemiology, and plant disease management at the level of the whole plant and in plant populations; impact and control of significant plant diseases.
Prerequisites: PLPA 301 or equivalent; approval of instructor.

PLPA 613 Advanced Plant Pathology Laboratory
Credit 1. 3 Lab Hours.
A laboratory course designed to demonstrate key components of the host-pathogen interaction and modern diagnostic and research techniques. Concurrent enrollment in PLPA 611 recommended.
Prerequisite: PLPA 301 or approval of instructor.

PLPA 614 Pathogens, the Environment, and Society
Credits 3. 3 Lecture Hours.
Survey the impact of microorganisms on development of modern culture and society; emphasize role pathogens have played in history of mankind; influence of changing environment on emerging diseases.
Prerequisite: Graduate classification.

PLPA 616 Methods in Molecular Biology of Plant-Microbe Interactions
Credits 2. 2 Lecture Hours.
Concepts and techniques used in molecular plant pathology to study the interactions between hosts and pathogens; focus on understanding the rationale for implementing certain procedures and the theoretical concepts underlying the methodology.
Prerequisite: Graduate classification.

PLPA 618 Bacterial Plant Diseases
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Bacterial diseases of fruit and vegetable crops, field crops and ornamental plants; nature of the disease, dissemination of the pathogen and methods of control.
Prerequisite: Approval of instructor.

PLPA 619 Plant-Associated Microorganisms
Credits 3. 3 Lecture Hours.
Basic concepts and current topics in plant-microbe interactions including the diversity of plant-associated microorganisms; the plant as a microbial environment; endophytes; microbial roles in plant nutrition and fitness; uses of microorganisms for improved plant health and sustainable agriculture; microbial roles in food safety and future challenges; discussion of current literature.
Prerequisites: Basic plant biology or plant ecology is recommended; microbiology is helpful, but not required. Cross listed with HORT 619 and MEPS 619.
PLPA 620 Plant Virology  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Overview of plant virology with emphasis on molecular biology of host-virus interactions; topics will include virus replication, gene expression, movement, symptoms, transmission and control; current literature and techniques important to virology presented. 
**Prerequisite:** Approval of instructor.

PLPA 623 Diseases of Field Crops  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Fundamental and practical aspects of more important and representative diseases of field crops; plant disease problems peculiar to extensive cultivation methods.  
**Prerequisites:** PLPA 301 and PLPA 303.

PLPA 626 Diagnosis of Plant Diseases  
Credits 2.1 Lecture Hour. 3 Lab Hours.  
Techniques employed in field diagnosis of plant diseases; histological and microbiological studies to verify initial diagnosis.  
**Prerequisite:** PLPA 625 or approval of instructor.

PLPA 630 Fungi: Physiology and Genetics  
Credits 2. 2 Lecture Hours.  
Exploration of genetic networks, and genome evolution; physiology of fungal development and plant pathogenesis.  
**Prerequisites:** Graduate classification or approval of instructor and concurrent enrollment in PLPA 631.

PLPA 631 Fungi Laboratory  
Credit 1. 3 Lab Hours.  
Demonstration of key modern concepts in the Kingdom Fungi; experiments with current research methodologies using fungi.  
**Prerequisites:** Graduate classification or approval of instructor and concurrent enrollment in PLPA 630 and/or PLPA 632.

PLPA 632 Fungi Cell Biology and Taxonomy  
Credits 2. 2 Lecture Hours.  
Fungi: Cell Biology and Taxonomy. Morphological and molecular phylogenetic survey of the Kingdom Fungi; cell biology of fungal form and function.  
**Prerequisites:** Graduate classification or approval of instructor and concurrent enrollment in PLPA 631.

PLPA 634 Turfgrass Pathology  
Credits 3. 3 Lecture Hours.  
Recognizing turfgrass problems and understanding biological mechanisms in the disease process; principles of disease management strategies.

PLPA 657 Biotechnology for Biofuels and Bioproducts  
Credits 3. 3 Lecture Hours.  
Biotechnology issues in developing bioenergy as a renewable energy source; emphasis on the three generations of bioenergy and enabling technologies; special topics include recent advances in bioenergy research, government policy, and industrial development.  
**Prerequisite:** Graduate classification.

PLPA 665 Viral Vectors and Gene Therapy  
Credits 3. 3 Lecture Hours.  
Describes various viral vector systems, their development, their use as research tools, and their use in biotechnology and gene therapy; consists of a mixture of short lectures and discussion of papers from the literature.  
**Prerequisites:** VTMI 663/MPIM 663, VTMI 647, PLPA 616, or PLPA 620 or approval of instructor.  
**Cross Listing:** MPIM 665 and VTMI 665.