

Discipline: Agriculture	Sub-discipline: Plant Science
General Course Title: Plant Diseases	Min. Units: 3 Semester
Proposed Suffix: L	
<p>Course Description: The study of agents, disease cycles, symptomology, and management of plant diseases. Management practices include prevention, cultural, chemical, and biological methods. Laboratory required.</p>	
Required Prerequisites or Co-Requisites ¹	
Advisories/Recommended Preparation ²	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> • Identify common plant diseases caused by fungi, bacteria, nematodes, and virus. • Explain laws, rules, and regulations for pest control. • Describe the economic importance of biological control methods. • Classify plant pathogens into genera and specie. • Diagram and describe pathogen life cycles. • Define common plant pathology terms. • Select proper methods and timing of control. • Identify signs and symptoms of plant disease. • Demonstrate methods of nematode extraction. • Identify and compare physiogenic diseases. • Compare alternate methods of pathogen control. • List environmental factors affecting disease incidence. • Describe mechanism of entry and resultant damage to plant. • Describe the vectors of plant disease. 	
<p>Course Content:</p> <ol style="list-style-type: none"> 1. Purposes <ol style="list-style-type: none"> A. Significance of plant disease in agriculture <ol style="list-style-type: none"> 1. Practical applications for the study of plant disease B. Symptoms of disease in plants <ol style="list-style-type: none"> 1. Overall plant health 2. Foliar symptoms 3. Stem and trunk symptoms 4. Root symptoms 5. Flower and fruit symptoms C. Methods of studying plant diseases <ol style="list-style-type: none"> 1. Mechanisms of pathogen infection <ol style="list-style-type: none"> a. Disease Triangle b. Koch's Postulates c. air, soil, and wound entry 2. Mechanisms of pathogen injury <ol style="list-style-type: none"> a. epidermal and near epidermal injury b. vascular injury c. systemic injury <p>Plant Diseases (Content Continued)</p> <ol style="list-style-type: none"> 2. Types of Plant Pathogens 	

¹ Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

² Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

- A. Fungi
 - 1. Rusts and smuts – some examples are:
 - a. asparagus rust
 - b. cedar apple rust
 - c. corn smut
 - 2. Scabs, rots, and related fungi
 - a. apple scab
 - b. brown rot of stone fruits
 - c. potato scab
 - 3. *Fusarius*, *Verticillium*, and wilt fungi
 - a. *Fusarium* wilt of tomato
 - b. *Verticillium* wilt of cotton
 - c. Dutch Elm disease
 - 4. Mildews, clubroot, and some molds
 - a. Powdery mildew – rose, pepper, grape, cucurbits, and other crops
 - b. Downy mildew of lettuce and grape and other crops
 - c. Clubroot of Brassicas
 - d. Anthracnose – various crops
 - e. Black sooty mold – various crops
 - 5. Damping off and similar fungi
 - a. *Pythium* sp.
 - 1) damping off in various crops
 - 2) cavity spot in carrots
 - b. *Rhizoctonia* sp.
 - 1) damping off in cotton
 - c. *Thielaviopsis* sp.
 - 1) cotton seedling disease
 - d. *Phytophthora* sp.
 - 1) *Phytophthora* of pepper and other crops
 - 6. Unique diseases – Cannonball Disease of melons
- B. Disease caused by bacterial pathogens
 - 1. Fire Blight of pear
 - 2. Halo Blight of bean
 - 3. Soft Rot – various crops
 - 4. Wilt – cucumber, tomato, and various crops
 - 5. Crown Gall – trees
- C. Diseases caused by virus, mycoplasma, and virus-like viruses
 - 1. Mosaic viruses – TMV, LMV, and other crops
 - 2. Spotting viruses – ringspot viruses and tomato spotted wilt viruses
 - 3. Leaf curling viruses
 - 4. Aster yellows
 - 5. Brittle root of horseradish

**Plant Diseases
(Content Continued)**

- D. Diseases caused by nematodes
 - 1. Root-Knot in various crops
 - 2. Cyst nematodes

<p>3. Other nematode disorders</p> <p>3. Methods of Disease Management</p> <p>A. Preventing infection – common transfer methods</p> <ol style="list-style-type: none"> 1. Seedborne pathogens 2. Pruning 3. Root grafting 4. Asexual propagation and mother plants 5. Other modes of infection <ol style="list-style-type: none"> a. spore germination and environmental monitoring <ol style="list-style-type: none"> 1) phenology data b. wound entering <ol style="list-style-type: none"> 1) insect or environmentally created wounds c. root entering d. insect transfer of pathogens 6. Resistant varieties <ol style="list-style-type: none"> a. effective life 7. Plant breeding for disease management <ol style="list-style-type: none"> a. single gene examples – gene for gene hypothesis b. multiple gene strategies 8. Cultural practices and preventing infection <ol style="list-style-type: none"> a. crop rotation and others <p>B. Once infection has occurred</p> <ol style="list-style-type: none"> 1. Purpose of spraying different materials <ol style="list-style-type: none"> a. examples of common materials b. laws, rules, and regulations 2. Removing infected parts or plants 3. Insect management to prevent further infection <p>C. Preventing future outbreaks</p> <ol style="list-style-type: none"> 1. Antagonistic fungi and bacteria and other biological management tools 2. Soil solarization 3. Sanitation practices 	
<p>Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.</p>	
<p>Methods of Evaluation: Lecture Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers</p>	<p>Methods of Evaluation: Laboratory Laboratory Skill Validation by Observation Laboratory Reports Laboratory Research Projects and Reports Laboratory Skill Practicum Exams</p>
<p>Typical Textbooks, Manuals, or Other Support Materials <u>Plant Pathology</u>. Agrios. <u>Plant Disease Syllabus</u>. Kenaga.</p>	
<p>Statewide Articulation: CPP-421/L*, other universities as lower division elective (*upper division – subject matter competency determined by university advisor)</p>	
<p>FDRG Lead Signature:</p> <p>Mark E. Bender, PhD CSU Stanislaus</p>	<p>Date:</p>
<p>[For Office Use Only]</p>	<p>Internal Tracking Number</p>
<p> </p>	

Descriptor Template Guide Sheet

Discipline: The discipline has been determined and is entered.

Subdiscipline: You may decide that a sub-discipline will serve your discipline best. For example, biology faculty may or may not decide to identify subdivisions (cellular vs. organismic, or marine, or ecology/environmental). Discipline faculty will determine what best serves their needs.

General Course Title: Insert a course name in this field that is generally used and will be widely recognized. It need not be the actual course title at all colleges or universities but should describe the topic of the course.

Minimum Units: Indicate the minimum number of units expected of this course, based on semester configuration; we will later offer a conversion into quarter units.

Proposed Number: Use the numbering protocol to assign a tentative number to the course; like the sub-discipline or general course title, during your drafting stages, this number can be changed.

Proposed Suffix: If desirable, add an "L" after the number in the box to indicate a lab; or an "S" to indicate this course is part of a sequence.

Rationale or Comment: Use this space to provide explanation to the field about the number; during the drafting stage, you may also use this space to record a request for an additional suffix or modification of the numbering protocol.

Required Prerequisites or Co-Requisites: List any courses required to be completed prior to taking the listed course; if there is not agreement among segmental faculty about the prerequisites, you might consider describing a similar course without those prerequisites or listing only Advisories/Recommended Preparation (see below). A co-requisite does not mean in the CCCs what it may mean for the 4-year institutions.

Advisories/Recommended Preparation: These recommendations for courses, experiences, or preparation need not be validated; they can be good-faith and generally accepted recommendations from discipline faculty that further the students' chances of success in this or subsequent courses.

Course Content: Count content should list all the expected and essential topics of the course. If this course is a lab/lecture combination, the Lab content should be spelled out separately.

Course Objectives: List the course objectives, competencies, or skills that the students should be able to demonstrate upon completion of the course. Community college faculty should be attentive to explicitly linking the objectives to the topics covered. If this course is a lab/lecture combination, again the learning objectives should be spelled out separately and be linked to the topics covered in the lab component of the course. Use additional sheets as needed.

Methods of Evaluation: List those methods you anticipate would be used to observe or measure the students' achievement of course objectives (e.g., quizzes, exams, laboratory work, field journals, projects, research, demonstrations, etc.)

Textbooks: Recent (published within the past 5-6 years) college-level texts, materials, software packages can be suggested here. While texts used by individual institutions and even individual sections will vary, enter examples of representative work. If this is a lab course or a lab/lecture section, remember to include an example of a lab manual.

FDRG Lead's Signature and Date: When the descriptor template has been finalized by the FDRG is in final form and is ready for posting, the Lead should send this completed and signed document to Kelly Miller at Kelly@asccc.org who will post the descriptor and solicit review and comment prior to finalizing the descriptor for the next phase of the C-ID Project.