PLP 300 Diseases of Fruit Crops
Fall 2020
T, TH 9:10 – 10:00 AM
Professors Grove and Rayapati

PLP 300: Diseases of Fruit Crops (Through Video Conferencing)

Number of Credits = 2; Pre-requisites = BIOLOGY 120, HORT 310, or HORT 313.

Lecture Schedule: Fall 2020, Tuesday and Thursday between 9:10 to 10:00AM
Origination: WSU-IAREC and WSU-TC/WSC
Room location: N/A

Method of course delivery: The course “nerve center” (course schedule, syllabus, lecture slides, lecture videos, class discussions, and exams) will be maintained on Blackboard. Lectures & discussions are videostreamed live via Zoom. Students will need access to the WSU network or other broadband access in order to take the course. The videostreamed classes through Zoom are usually recorded and the videos are generally posted to the class Blackboard site. Only students enrolled in the class will have access to these archived videos. Archiving may take approximately 2-4 business hours after the daily class ends and the videos remain on the site until the end of the semester. It should be noted that archiving these videostreams are not guaranteed and are only a courtesy of WSU. **These archived videos cannot substitute class attendance and, therefore, are not intended to be used as a primary way to access classes.** Powerpoint, Keynote, or Prezi versions of lectures will be posted on the Blackboard site within 24 hours of the respective lecture.

Instructors:

Naidu Rayapati, Professor of Plant Pathology (Virology), Department of Plant Pathology, Washington State University (WSU), Irrigated Agriculture Research and Extension Center, 24106 N. Bunn Road, Prosser, WA 99350.
Contact: 509-786-9215 (Office); 509-788-5350 (Mobile); E-mail: naidu.rayapati@wsu.edu; 155 Hamilton Hall, IAREC, Prosser.

Gary Grove, Professor of Plant Pathology, Department of Plant Pathology, Washington State University (WSU), Irrigated Agriculture Research and Extension Center, 24106 N. Bunn Road, Prosser, WA 99350.
Contact: 509-786-9283; E-mail: grove@wsu.edu, 162 Hamilton Hall, IAREC, Prosser or Room 241, Wine Science Center, WSU-Tri Cities, Richland, WA 99352.
Office hours: 10:00 am – 11:00 am Tuesday and Thursdays and 4:00 pm – 5:00 pm on Fridays beginning 9/29 (via Zoom); other hours by appointment (via Zoom).
Recommended Text Books:

No specific textbook is assigned for the course, since a few text books exclusively cover diseases of fruit crops. The following general plant pathology text books, compendia of specific fruit crop diseases, and current information from the primary literature (journal and review articles and web sites) are recommended as resources for the course.


References for additional reading:

I. Crop-specific books/compendia:


II. Supplemental references:


### III. Web sites:

http://wine.wsu.edu/virology/
http://americanpomological.org/
http://plant-disease.ippc.orst.edu/index.cfm
http://treefruit.wsu.edu
http://www.agf.gov.bc.ca/cropprot/tfipm/treefruitipm.htm
http://www.apsnet.org

### Specific learning outcomes of the course:

Class lectures and discussions will contribute to the following learning outcomes:
- Acquire scientific knowledge about diseases and disorders in fruit crops.
- Gain familiarity with regard to field- and lab-based approaches for the diagnosis of diseases and pathogens in fruit crops.
- Become familiar with different modes of spread of pathogens in fruit crops.
- Ability to apply knowledge gained from the course to manage diseases in fruit crops.
- Gain awareness of negative impacts of diseases on agricultural production and quality of produce in fruit crops.

### Instructor-specific Expectations:

- Attend zoom classes regularly, ask questions, participate actively in classroom discussions.
- No cell phones, text messaging, internet browsing during the class, no late arrivals to class.
- Gain familiarity with and follow COVID-19 safety guidelines as outlined in the syllabus and follow these procedures as appropriate.
- Submit online course evaluation at the end of the semester.

### Class Attendance:

Class attendance is very important. Missing even one class will put students out of synch with the course leading to poor performance in the exams. Students are encouraged to ask questions during the lecture or outside the class time. Due to virtual format of classes, arrangements will be made by appointment to answer questions (via telephone, e-mail and/or face-to-face zoom meeting), if students would like assistance with class materials.

Class attendance is required unless excused. Excused absence is considered because of “illness, personal crises, mandated court appearances, parental responsibilities, and the like.” These absences are considered and accepted on a case by case as long as they are not excessive and provide a written explanation of the absence. In addition, “reasonable accommodation can be
provided in regards to religious holidays as spelled by Academic Regulation 82”. Contact the instructor for necessary approvals as per Academic Regulation 73.

**Student Evaluations:**

Students will be encouraged to participate in on-line evaluations. **In order to increase response rate, a minor incentive of 10 points (10 points of total 300 points, which is ~3%) will be added at the end of semester to the final grade to those students who have completed evaluations on time.**
**Lecture Schedule:** Fall 2020, Tuesday and Thursday between 9:10 to 10:00AM  
**Origination:** WSU-IAREC and WSU-TC/WSC  
**Room location:** N/A  

**Guest lectures:** Whenever feasible, faculty in the Departments of Plant Pathology and Horticulture will give guest lectures and industry stakeholders will participate in class discussions.

<table>
<thead>
<tr>
<th>Date</th>
<th>Instructor</th>
<th>Area</th>
<th>Lecture Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.25.2020</td>
<td>Rayapati/Grove</td>
<td>Intro</td>
<td>Introduction to the course; significance of fruit industry of Washington State</td>
</tr>
<tr>
<td>8.27.2020</td>
<td>Rayapati</td>
<td>Intro</td>
<td>An overview of plant pathogens</td>
</tr>
<tr>
<td>9.1.2020</td>
<td>Rayapati</td>
<td>Virus</td>
<td>Nature and biology of plant viruses</td>
</tr>
<tr>
<td>9.3.2020</td>
<td>Rayapati</td>
<td>Virus</td>
<td>Diagnosis, spread, and management of virus diseases</td>
</tr>
<tr>
<td>9.8.2020</td>
<td>Rayapati</td>
<td>Virus</td>
<td>Virus diseases of fruit crops – Part I</td>
</tr>
<tr>
<td>9.10.2020</td>
<td>Rayapati</td>
<td>Virus</td>
<td>Virus diseases of fruit crops – Part II</td>
</tr>
<tr>
<td>9.15.2020</td>
<td>Rayapati</td>
<td>Virus</td>
<td>Virus diseases of fruit crops – Part III</td>
</tr>
<tr>
<td>9.17.2020</td>
<td>Rayapati</td>
<td>Virus</td>
<td>Disorders mimicking viral diseases in fruit crops</td>
</tr>
<tr>
<td>9.22.2020</td>
<td>Rayapati</td>
<td>Virus</td>
<td>Management of virus diseases in fruit crops (Case study: Grapevine leafroll disease)</td>
</tr>
<tr>
<td>9.29.2020</td>
<td>Grove</td>
<td>Fungi</td>
<td>Nature and biology of fungi</td>
</tr>
<tr>
<td>10.01.2020</td>
<td>Rayapati/Grove</td>
<td>Virus</td>
<td>Virtual field trip on virus, bacterial and fungal diseases</td>
</tr>
<tr>
<td>10.06.2020</td>
<td>Grove</td>
<td>Bacteria</td>
<td>Fire blight</td>
</tr>
<tr>
<td>10.08.2020</td>
<td>Grove</td>
<td>Bacteria</td>
<td>Crown gall</td>
</tr>
<tr>
<td>10.13.2020</td>
<td>Grove</td>
<td>Bacteria</td>
<td>Pierce’s disease and Western X-disease</td>
</tr>
<tr>
<td>Date</td>
<td>Instructor</td>
<td>Area</td>
<td>Lecture Topic</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------</td>
<td>-----------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10.15.2020*</td>
<td>Exam 1</td>
<td>Viruses and Bacteria</td>
<td>Online exam during regular class period; 150 points. Students will have 50 minutes to complete the exam.</td>
</tr>
<tr>
<td>10.20.2020</td>
<td>Grove (Gleason)</td>
<td>Nematodes</td>
<td>Diseases caused by nematodes and their management</td>
</tr>
<tr>
<td>10.22.2020</td>
<td>Grove</td>
<td>Fungi</td>
<td>Epidemiology of fungal diseases</td>
</tr>
<tr>
<td>10.27.2020</td>
<td>Grove</td>
<td>Fungi</td>
<td>Principles of fungal disease management</td>
</tr>
<tr>
<td>10.29.2020</td>
<td>Grove</td>
<td>Fungi</td>
<td>Fungicides: Types, chemistry and resistance</td>
</tr>
<tr>
<td>11.03.2020</td>
<td>Grove</td>
<td>Fungi</td>
<td>Fungal diseases of fruit crops (overview)</td>
</tr>
<tr>
<td>11.05.2020</td>
<td>Grove</td>
<td>Fungi</td>
<td>Fungal diseases of tree fruit (Case study: Cherry and Apple Powdery mildews)</td>
</tr>
<tr>
<td>11.10.2020</td>
<td>Grove (Moyer)</td>
<td>Fungi</td>
<td>Management of fungal diseases of grapes (Case studies: Powdery Mildew and Botrytis Bunch Rot)</td>
</tr>
<tr>
<td>11.12.2020</td>
<td>Grove (Moyer)</td>
<td>Fungi</td>
<td>Fungal diseases of small fruits (Case studies: Mummy berry and Phytophthora root rot)</td>
</tr>
<tr>
<td>11.17.2020</td>
<td>Grove</td>
<td>Fungi</td>
<td>An overview of post-harvest diseases</td>
</tr>
<tr>
<td>11.23-27.2020</td>
<td>Thanksgiving Holiday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.01.2020</td>
<td>Guest Lectures (Evans)</td>
<td>Breeding (Evans)</td>
<td>Traditional and molecular approaches, and challenges in perennial crops – Case study: Apples</td>
</tr>
<tr>
<td>12.03.2020</td>
<td>Guest Lectures (McCord)</td>
<td>Breeding (McCord)</td>
<td>Traditional and molecular approaches, and challenges in perennial crops – Case study: Cherries</td>
</tr>
<tr>
<td>12.08.2020</td>
<td>Guest Lectures</td>
<td>Industry leaders (grapes)</td>
<td>Corliss, Hamman, Means</td>
</tr>
<tr>
<td>Date</td>
<td>Instructor</td>
<td>Area</td>
<td>Lecture Topic &amp;</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------</td>
<td>---------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>12.010.2020</td>
<td>Guest Lectures</td>
<td>Industry leaders (tree</td>
<td>Hanrahan, Schreiber</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and small fruits)</td>
<td></td>
</tr>
<tr>
<td>Week of 12.14.2020*</td>
<td>FINALS WEEK</td>
<td>Final</td>
<td>150 points. Date and time of final will be established later.</td>
</tr>
</tbody>
</table>

&Order of some lecture topics might change during the course.
*Date for Exam 1 is subject to change with advance notice. Date and time for final Exam during finals week will be provided later. No comprehensive final exam. Final exam will cover topics from nematodes through breeding.

**Overall Course Grading:**

There is one exam during the term worth 150 points and a final exam worth 150 points. The exams will take largely the form of fill-in-the-blank, true/false, multiple choice, and a few short answer questions. The short answer questions will be “thought-provoking” and are designed to require application of information presented in class to real-world situations. The exam(s) will also be supplemented, if required, with assignments/Quizzes at the discretion of the instructor. Misspelling of scientific names of fruit crops and pathogens will cost points. Thus, final grades will be based on sum of points from both exams (300 points).

Exams will be conducted similar to zoom courses offered through Blackboard as per WSU policies (Academic Regulations 77, 78, and 79). Students will have the class period to complete each exam. Make-up exam will be allowed ONLY for Exam 1, but NOT final exam under a valid medical or family emergency. Note that “no early examination will be conducted before the scheduled final exam for the purpose of leaving the institution before the close of the semester (Academic Regulation 79).”

**Grading Scale:**

A = 95 – 100%
A’ = 90 – 94%
B’+ = 86 – 89%
B = 82 – 85%
B’ = 80 – 81%
C’+ = 76 – 79%
C = 72 – 75%
C’ = 70 – 71%
D’+ = 66 – 69
D = 60 – 65%
F = Below 60%
COVID-19 Statement
Students are expected to abide by all current COVID-19 related university policies and public health directives, which could include wearing a cloth face covering, physically distancing, self-attestations, and sanitizing common use spaces. All current COVID-19 related university policies and public health directives are located at [https://wsu.edu/covid-19/](https://wsu.edu/covid-19/). Students who do not comply with these directives may be required to leave the classroom; in egregious or repetitive cases, students may be referred to the Center for Community Standards for university disciplinary action.

Academic Integrity:

“Academic integrity is the cornerstone of the university. Any student who attempts to gain an unfair advantage over other students by cheating, will fail the assignment and be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3).” All students enrolled in the class are expected to remember and practice Academic Honesty in fulfilling all of the course requirements as outlined in the syllabus. Please use these resources to ensure that you don’t inadvertently violate WSU's standard of conduct. “Students are expected to read the Washington State University Policy on Student Standards and Accountability ([https://conduct.wsu.edu/](https://conduct.wsu.edu/)). Students are free to contact the Office of Student Standards and Accountability (509-335-4532) for specific information about this process.

Reasonable Accommodation Statement
Students with Disabilities: Reasonable accommodations are available for students with documented disabilities or chronic medical or psychological conditions. If you have a disability and need accommodations to fully participate in this class, please visit your campus’ Access Center/Services website to follow published procedures to request accommodations. Students may also contact their campus offices to schedule an appointment with a Disability Specialist. All disability related accommodations are to be approved through the Access Center/Services on your campus. It is a university expectation that students visit with instructors (via email, Zoom, or in person) to discuss logistics within two weeks after they have officially requested their accommodations.

For more information contact a Disability Specialist on your home campus:

- **Pullman**, WSU Global Campus, Everett, Bremerton, and Puyallup: 509-335-3417 [Access Center](https://www.accesscenter.wsu.edu) or email [access.center@wsu.edu](mailto:access.center@wsu.edu)
- **Spokane**: 509-358-7816 [Access Services](https://spokane.wsu.edu/studentaffairs/access-resources/) or email [j.schneider@wsu.edu](mailto:j.schneider@wsu.edu)
- **Tri-Cities**: [Access Services](https://tricities.wsu.edu/current-students/disability/) or email [g.hormel@wsu.edu](mailto:g.hormel@wsu.edu)
- **Vancouver**: 360-546-9238 [Access Center](https://studentaffairs.vancouver.wsu.edu/student-wellness-center/access-center) or email [van.access.center@wsu.edu](mailto:van.access.center@wsu.edu)
Accommodation of Religious Observances
Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who feel they have been treated unfairly in terms of this accommodation may refer to Academic Regulation 104 - Academic Complaint Procedures.

Severe Weather Policy
For severe weather alerts, see: http://alert.wsu.edu/ and https://oem.wsu.edu/emergency-procedures/severe-weather/. In the event of severe weather affecting university operations, guidance will be issued through the alert system.

Learning Management System
Blackboard

Discrimination and Harassment Policy Statement
Discrimination, including discriminatory harassment, sexual harassment, and sexual misconduct (including stalking, intimate partner violence, and sexual violence) is prohibited at WSU (See WSU Policy Prohibiting Discrimination and Harassment (Executive Policy 15) and Standards of Conduct for Students (WAC Code 504-26) ). If you feel you have experienced or have witnessed discriminatory conduct, you can contact the WSU Office of Civil Rights Compliance & Investigation (CRCI) and/or the WSU Title IX Coordinator (see crci.wsu.edu/title-ix/) at 509-335-8288 to discuss resources, including confidential resources, and reporting options. (Visit crci.wsu.edu for more information). Most WSU employees, including faculty, who have information regarding sexual harassment or sexual misconduct are required to report the information to CRCI or a designated Title IX Coordinator or Liaison. (Visit crci.wsu.edu/reporting-requirements for more info).

SAFETY
Washington State University is committed to maintaining a safe and secure environment for students, faculty, staff, and visitors on all campuses. WSU urges students to follow the “Alert, Assess, Act” protocol for all types of emergencies and the “Run, Hide, Fight” response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able to). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI’s Run, Hide, Fight video and visit the WSU safety portal.
The university has developed a Campus Safety Plan (http://safetyplan.wsu.edu/) and WSU ALERT (http://alert.wsu.edu). We encourage you to become familiar with the Campus Safety Plan and visit the Office of Emergency Management web site (http://oem.wsu.edu/) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community. WSU continues to improve emergency management strategies and takes a broad range of proactive measures aimed at safety and well-being of its members in these campuses. Visit the Office of Emergency Management (http://oem.wsu.edu/emergencies) and WSU ALERT site (http://alert.wsu.edu/) for detailed information about campus safety and security, and relevant notification during emergencies. You can sign up for campus safety alerts at http://alert.wsu.edu through the MyWSU site (http://my.wsu.edu). Please go to the myWSU portal at http://my.wsu.edu and register your emergency contact information for the Crisis Communication System (CCS) and the Campus Outdoor Warning System (COWS). Enter your network ID and password and you will be taken to the myWSU main webpage. Look for the Emergency Notification box on the right side of the page and click on Register to be taken to the registration page where you can enter your cell, landline, and email contact information.

For students at Tri-Cities campus, a more comprehensive explanation of the campus safety plan is available at http://www.tricity.wsu.edu/safetyplan/. Should there be a need to evacuate the building (e.g. fire alarm or some other critical event), students should meet the instructor at the entrance outside of the Wince Science Center building.

Please visit the websites http://safetyplan.wsu.edu and http://oem.wsu.edu/Emergencies for the Campus Safety Plan and University emergency management plan, respectively, for a comprehensive listing of university policies, procedures, statistics, and information relating to campus safety, emergency management, and the health and welfare of the campus community.

**Zoom Meeting Guidelines**

**Preparation:**

- Locate yourself in a quiet and comfortable space.
- Have your video and audio device connected to your device and tested before you begin. If you are connecting to an audio-only meeting, you only need a microphone.
- Please ensure that all other chat and video applications are not running. If on a mobile device, close any other apps.
- When connecting your machine to the internet, wired is preferred over wireless. If using wireless, a reliable internet connection is recommended. For mobile calls, it is recommended to be on wireless, so you don’t use your mobile bandwidth

**Join meeting procedure:**

- Launch the Zoom application.
- If you have a meeting invite in an email or calendar event, then click the join hyperlink. You may be prompted to open Zoom from your browser. You may need to use WSU ID to login.
For Audio Only Meetings –

- Select the **Join With Computer Audio**
- If you use the assigned Meeting ID, checkmark the “**Turn off my Video**” option.

**In call etiquette:**

- Once you are observed, mute your microphone unless you are speaking. Please remember to mute in the application and not at the headset. Some headsets have a mute on the cord, but these do not fully mute audio on some headsets, so please do not use it.
- Be aware that you are always on camera; anything you would not do in public would apply here.
- Unless you are presenting, please do not open additional applications such as email, Word, or PowerPoint. Surfing the internet while participating in a call will degrade your experience, as well as the experience of others.
WSU-Tri Cities Campus Additional Information

CH2M STEM TUTORING CENTER
Free tutoring in math, biology, chemistry and physics, on a drop-in basis is available for undergraduate students. Tutoring will be delivered virtually. To find subject and tutor hours, please visit the CH2M Tutor website.

THE WRITING CENTER
The WSU Tri-Cities Writing Center is a free, drop-in, peer tutoring service and academic resource available to all students, of any discipline. Our goal is to create a positive, encouraging, and inclusive writing community through supporting students during any phase of the writing process. We will open for appointments and on a drop-in basis beginning the 3rd week of the semester. Visit https://tricities.wsu.edu/academic-resources/writing-center/ for more information.

STUDENT SUPPORT SERVICES
Academic success can be challenging if you have trouble meeting basic needs like safe shelter, sleep, and nutrition. If you have difficulty affording groceries or accessing sufficient food to eat every day, lack a safe and stable place to live, have an emergency, or just need support, I urge you to contact Student Support Services at 509-372-7433, review the list of services available on the Student Support Services website, stop by the Cougar Cupboard in the East Commons, and/or speak to a member of the team. We want to help you. If you have a friend who needs support, consider filling out a Cougar Cares or review the list of services available on the Student Support Services website.

Students in Crisis – WSU Tri-Cities Resources
If you or someone you know is in immediate danger, DIAL 911 FIRST!
Student Care Network: https://tricities.wsu.edu/current-students/cougarcares/ 509-372-7433
WSU Tri-Cities Student Emergency Hardship Fund: https://tricities.wsu.edu/current-students/student-emergency-hardship-fund/
WSU Tri-Cities Mental Health Counseling: 509-372-7153
Suicide Prevention Hotline: 800 273-8255
Crisis Text Line: Text HOME to 741741
WSU Tri-Cities Campus Security: 509-372-7698
WSU Tri-Cities Campus Emergency: 509-372-7234
WSU Tri-Cities Deputy Title IX Director: 509-372-7381
Support, Advocacy, and Resource Center (SARC): 888-846-7273
WSU Health Sciences 24/7 Crisis Line: 509-368-6500