

CROP GROWTH AND DEVELOPMENT

Goal

The goal of the course is to introduce students to the morphology, anatomy, growth, and development of agronomic and horticultural crops.

Instructors

Dr. Teresa Cerny-Koenig, 155 Johnson Hall, 335-3462, tckoenig@wsu.edu

Office hours: MW 2 to 4 pm or by appointment

Teaching Assistant:

Office hours:

Class Time

Lecture: MWF 9:10 to 10:00 am, Johnson Hall C105

Labs: T 9:10 to noon or 2:10 to 5 pm in PBS 35

Pre-requisites

Hort/Crops 102 recommended

Biology 106, Biology 107, or Biology 120 recommended

Required Text Book

Principles of Plant Science: Environmental Factors and Technology in Growing Plants by Dennis R. Decoteau. 2005. Pearson Education, Inc. Upper Saddle River, NJ

Learning Outcomes

Through engagement in the class, students will:

- Understand the role of plants in society
- Develop skills in scientific inquiry and the contribution of new knowledge and creativity in the plant science disciplines
- Enhance knowledge and skills related to emerging technologies in the plant sciences
- Develop abilities to apply critical thinking to problem solving situations
- Develop written and oral communication skills

Grades**Lecture**

- Four hourly exams (100 points each) 300 points
(Each is comprehensive – *lowest one is dropped*)
- Research article summary (Due: Feb. 22) 50 points
- Faculty interview (Due: March 28) 30 points
- Lecture quizzes, assignments, and participation 50 points

Lab

- Lab attendance, participation, and assignments 45 points
- Research Project (see last page for breakdown of points) 100 points

Total = 575 points

Grading scale

| | | | |
|-----------|----|----------|----|
| 100 - 93% | A | 77 - 79% | C+ |
| 90 - 92% | A- | 73 - 76% | C |
| 87 - 89% | B+ | 70 - 72% | C- |
| 83 - 86% | B | 66 - 69% | D+ |
| 80 - 82% | B- | 60 - 65% | D |
| | | ≤59 | F |

Expectations – The lecture topics and chapters are listed in the syllabus. You should read the indicated chapter(s) before coming to class so you can participate in the class discussion and get more out of the lectures.

Late assignments - All assignments are due at the beginning of class on their due date. Late assignments will result in a 10% grade penalty per day beginning the first day the assignment was due.

Hourly exams and quizzes cannot be made up if missed (See policy below on approved absences). Quizzes may be announced or unannounced. Exams and quizzes will include information covered in lecture and in lab.

Attendance is expected and will sometimes be recorded - Attendance and participation in class sessions will be encouraged and may influence the course final grade. Absences because of illness, personal and/or family crises, mandated court appearances, university approved events, or similar reasons will be accommodated as long as such absences are not excessive and notification is provided to the instructor *in advance*. Excused absences will be easier to secure if notification is given prior to any known or planned event. Students who attempt to gain advantage through abuse of this policy (i.e., by providing false information to the instructor) may be referred to the Office of Student Affairs. Frequent absences will result in grade reductions. Required University activities will be excused absences if an official Class Absence Request form signed by the sponsoring faculty or organization is given to the instructor before the event.

CROP GROWTH AND DEVELOPMENT

| LECTURE TOPICS | BOOK CHAPTERS |
|---|---------------------------------------|
| <i>Overview of the Plant Sciences</i> | |
| Plants and society | 1, 2, 4, 5 |
| The sciences of plants | |
| <i>Basics of Plant Growth and Development</i> | |
| Structure of plants | |
| Anatomy of plants | |
| | EXAM I (Feb. 8th)* |
| Plant growth | |
| Plant development | |
| <i>Overview of Plant Processes</i> | 5, 6 |
| Photosynthesis | |
| Respiration | |
| | EXAM II (March 5th) |
| Plant hormones | |
| Genomics and biotechnology | |
| <i>Aerial Environment</i> | 7, 9, 10, 11, 12, 15 |
| Overview of the aerial environment | |
| Irradiance | |
| Temperature | |
| Mechanical disturbances | |
| | EXAM III (Apr. 9th) |
| <i>Rhizosphere Factors</i> | 16, 17, 18, 19 |
| Overview of the rhizosphere | |
| Water | |
| Nutrients | |
| Soil organisms | |
| FINAL EXAM () | |

All the exams are comprehensive and build on information from the previous lectures and exams.

*** Dates indicate approximate exam times.**

| NO. | DATE | LAB SCHEDULE |
|------------|--------------|---|
| 1 | Jan. 8 | <i>Introduce group research projects</i> |
| 2 | Jan. 15 | Library orientation -?????, Owen Library 319D |
| 3 | Jan. 22 | Library time to work on research article summary assignment <i>Work on finding information/references for your projects</i> |
| 4 | Jan. 29 | Plant anatomy (cell type, meristems, and roots) <i>Research topic (hypothesis) and list of group members due</i> <i>Meet with instructor/TA about project</i> |
| 5 | Feb. 5 | Plant anatomy (stem and leaf anatomy) <i>List of materials needed for the project due</i> |
| 6 | Feb. 12 | Start seeds for future labs <i>Start setting up group research projects in greenhouse</i> |
| 7 | Feb. 19 | Research article summary assignment due (review in class) Seeds and seedling emergence |
| 8 | Feb. 26 | Seedling growth and development <i>Present your project to the class</i> <i>Reference list for project and how the references relate due</i> |
| 9 | Mar. 4 | Asexual propagation <i>Update the class on your project</i> <i>Introduction and materials/methods for project due</i> |
| | Mar. 10 - 14 | Spring Break |
| 10 | Mar. 18 | Genomics and biotechnology |
| 11 | Mar. 25 | Genomics and biotechnology <i>Take data on research projects</i> |
| 12 | April 1 | Visit wheat greenhouse facilities/wheat breeding demo <i>Take data on research projects</i> <i>Rough draft of poster due</i> |
| 13 | April 8 | Soil temperature, light quantity, and location <i>Results, discussion, and conclusion</i> |
| 14 | April 15 | <i>Work on research projects and poster printing</i> |
| 15 | April 22 | <i>Clean up greenhouse and lab projects. Course/TA evaluations</i> |

Tasks and due dates for the group research project are italicized

GROUP RESEARCH PROJECT

You will work as a team of 2 to research, implement, analyze, document, and communicate your information on a research project related to plant growth and development. Working on the group research project will advance your knowledge of plant science as well as your critical thinking and communication skills for future courses, internships, and jobs.

Your group will be responsible for all parts of your project including the routine greenhouse tasks such as watering, fertilizing, staking, transplanting, and overall maintenance of your plants. (Exception: Application of pesticides and other chemicals will only be done by a certified pesticide applicator!)

The 120 points for the research project will be broken down into the following tasks:

10 pts = Developing an interesting and creative project objective (hypothesis)
and a relevant source list for the topic

10 pts = Introduction and materials/methods

50 pts = Final poster

30 pts = Maintaining plants and experiment in the greenhouse

100 pts

| Due Date | Tasks for the research project |
|-----------------|---|
| January 22 | Objective (hypothesis) and list of group members |
| January 29 | List of materials needed for the project |
| February 12 | Set up group research projects in greenhouse |
| February 26 | List of references and how references relate to project |
| March 4 | Summary of introduction and materials/methods |
| April 1 | Rough draft of poster layout |
| April 15 | Poster printing |
| April 22 | Clean up greenhouse and lab |

Summaries for each of the sections should be written as they will appear on the poster. Use bulleted lists, pictures, diagram, and tables as much as possible.

Disability statement

I am committed to providing assistance to help you be successful in this course. Reasonable accommodations are available for students with a documented disability. Please go to the Disability Resource Center (DRC) during the first two weeks of every semester to seek information or to qualify for accommodations. All accommodations MUST be approved through the DRC, located in the Administration Annex Bldg, Room 205. To make an appointment with a disability counselor, please call 335-3417.

Cheating (WAC 504-25-310)

Cheating is the intentional use of, or attempt to use, unauthorized material, information, or study aids in any academic activity to gain advantage. Cheating includes, but is not limited to, communicating improperly with others, especially other students, during tests or the preparation of assignments for classes; copying from books, notes, or other sources during a test when this is not permitted; copying from another student's work (reports, laboratory work, computer programs, files, etc.); making improper use of calculators or other devices during a test; illegitimately procuring or using copies of current examinations; allowing a substitute to take an examination or write a paper for oneself.

Plagiarism (WAC 504-25-310)

Plagiarism is knowingly representing the work of another as one's own, without proper acknowledgment of the source. The only exceptions to the requirement that sources be acknowledged occur when the information, ideas, etc., are common knowledge. Plagiarism includes, but is not limited to, submitting as one's own work the work of a "ghost writer" or work obtained from a commercial writing service; quoting directly or paraphrasing closely from a source without giving proper credit; using figures, graphs, charts, or other such material without identifying the sources.

Academic Integrity Processes (WAC 504-25-315)

Every act of academic dishonesty affects academic evaluation of the student and also is a violation of the University's standards of conduct. Responsible instructors retain the authority and responsibility to assign grades to students, considering from an academic standpoint the nature of the student's action. This is the case even when the case is referred to the University Academic Integrity Process. Students have recourse to appealing the responsible instructor's assignment of grades according to usual academic policy. See Academic Regulation 104.

All clear instances of academic dishonesty shall be reported to the Office of Student Conduct as outlined in 504-35-335(2). The first reported instance at WSU of academic dishonesty by a student will be treated as purely an academic matter unless, in the judgment of the responsible instructor, more serious action should be taken through the disciplinary process. Any allegation of subsequent academic dishonesty will be treated as a matter to be referred to the Office of Student Conduct.

Reports of Academic Dishonesty (WAC 504-35-320)

Any member of the University community who witnesses an apparent act of academic dishonesty shall report the act either to the instructor responsible for the course or activity or to the Office of Student Conduct.