PLANT SCIENCES 206: PRINCIPLES OF PLANT SCIENCES
SYLLABUS - Fall 2017 for Lecture and Lab

Lectures: Tuesday & Thursday,
8:00-09:15 a.m.

Room AGR-E G06

Laboratory: Tues, Thurs., or
Friday 2:00 - 4:50 p.m.

AGR-E 2304 (T, R, F)

Instructor: Kang-Mo Ku

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Office: 3316, Agricultural Sci. Bldg.

Office Hours:
Tuesday 9:15-11:15 a.m.
Thursday 9:15-11:15 a.m.
or by appointment as necessary.

Lab Section No.	Time	Teaching assistant
T	2:00 - 4:50 p.m	Kang Mo Ku/Suejin Park
R	2:00 - 4:50 p.m	Suejin Park
F	2:00 - 4:50 p.m	Emily E. Filik

*****Add "**[PLSC206]"** and **topic** in the **Subject Line** of your e-mail.

Recommended Textbook:

Ray F. Evert and Susan E. Eichhorn. 2012.
Raven Biology of Plants (8th edition).
Freeman W.H. & Company.

Supplementary Readings:
Students are responsible for studying any **Mandatory Material** posted on Blackboard Learn by the instructor.

Optional Reading Material will be posted for those students who are particularly interested in plant science topics.

Required Item:

I>Clicker is ***essential*** for attendance and quizzes (see page 4).

Students are responsible for I>Clicker connection and battery. You are responsible for registering your own clicker, following the manufacturer's instructions. **Without proper registration, students cannot get any lecture component scores (190 points)**.

PLSC206 Fall 2017 Lecture Schedule

	Date	Lecture	Extra credits	eCampus Quiz
1	Aug 17	Introduction Course and Syllabus	Introduce yourself in eCampus, 10 pts (Due Aug 25, 11:59 PM)	
2	Aug 22	Plant Cell and Transport		
3	Aug 24	Roots		
4	Aug 29	Plant Tissues and Evolution		Quiz 1
5	Aug 31	Stem		
6	Sep 5	Leaf		
7	Sep 7	Flower		
8	Sep 12	Fruit		
9	Sep 14	Seeds and Germination		Quiz 2
10	Sep 19	**FIRST EXAM**		
11	Sep 21	Photosynthesis (Guest lecture Dr. Gutensohn)		
12	Sep 26	Respiration -Clicker quiz 90 pts-		
13	Sep 28	Primary Metabolism		
14	Oct 3	Water Relations & Transpiration		Quiz 3
15	Oct 5	Mineral Nutrition		
16	Oct 10	Plant Hormones 1		
17	Oct 12	Career Preparation (Guest lecture from BrightView)		
18	Oct 17	Plant Hormones 2		
19	Oct 19	Abiotic Factors		Quiz 4
20	Oct 24	**SECOND EXAM**		
21	Oct 26	Secondary Metabolites 1		
22	Oct 31	Secondary Metabolites 2		
23	Nov 2	Plant Propagation		
24	Nov 7	Plant-Biotic Interactions 1		
25	Nov 9	Plant-Biotic Interactions 2		
26	Nov 14	Plant Genetics and Breeding		Quiz 5
27	Nov 16	Plant Biotechnology	Biotechnology and future Essay (Due Nov 28, 11:29 PM)	
28	Nov 28	Crop Domestication		
29	Nov 30	Crop Production System		
30	Dec 5	Plant and Human Use		Quiz 6
31	Dec 8	**FINAL EXAM (8AM-9AM)**		

PLSC206 Fall 2017 Lab Schedule

	Date	Topic	Lab Activity	Note
L1	Aug 17-18 ***No lab class***	Introduction into Microscopy	- Watch online movies about light microscopy - Take a test eCampus *Due: Aug 28,11:59PM.	eCampus
L2	Aug 21-25	Plant Cell Root	- Microscopy of corn root tip (longitudinal section) - Root organization, root hairs - Microscopy of young and mature dicot root (cross section)	Lab report on-site
L3	Aug 28-Sep 1	Stem Leaf	- Microscopy of stem apex (*Sambucus* longitudinal sect.) - Microscopy of stem cross section (dicot and monocot) - Microscopy of leaf cross section (dicot, monocot) - Microscopy of epidermal peel (dicot, monocot)	Lab report on-site
L4	Set 4 - 8	Leaf waxes and agriculture	- Effect of surfactant on water retention of waxy leaf surfaces **[Pre-lab],** *Formal lab report*	**Computer**[1)]
L5	Sep 11 - 15	Fertilizer and plant hormone on plant growth	- Sowing corn seeds with or without Osmocotes - Sowing pea seeds for GA treatment - Fertilizer on plant growth	
	Sep 18 – 22	***No lab class***	TA and Professor attend conference.	
L6	Sep 25 - 29	Flower and Fruit	-Drawing lily flower -Microscopy of anther and ovary cross section -Dissect Fruit (cherry tomato)	Lab report on-site
L7	Oct 2 - 6	Photosynthesis	- TLC photosynthetic pigments (chlorophyll and carotenoids) **[Pre-lab]** - Leaf disk photosynthesis	Post lab quiz
L8	Oct 9 - 13	Carbohydrate Metabolism Plant Hormones	- Starch and amino acids quantification from germinating seeds - GA effect on pea (measure length of internode)	Post lab quiz
L9	Oct 16 - 20	Water Relations	- Water potential of potato tubers **[Pre-lab]** - Plasmolysis	Lab report on-site **Computer**
L10	Oct 23 - 27	Mineral Nutrition	- Check nutrient deficiency from **L5** corn - Chlorophyll and amino acids quantification from corn leaf, *Formal lab report*	**Computer**
L11	Oct 30 – Nov 3	Secondary Metabolites 1	- Allelopathy (seed germination set up) - Anthocyanin color change by pH (on-site report)	Post lab quiz
L12	Nov 6 - 10	Secondary Metabolites 2	- Allelopathy results check (*Formal lab report*)	Post lab quiz **Computer**
L13	Nov 13 - 17	Plant lipid for human use	- Herbs, essential oils, lip balm	Post lab quiz
Fall Recess (Nov 18 – 26)				
L14	Nov 27 – Dec 1	Plant for human health	- DPPH antioxidant assay	Post lab quiz

[1)]Students are required to **bring computer and digital camera or smartphone** with camera for image analysis. ImageJ should be installed in computer (https://imagej.nih.gov/ij/).

Credits

		Total
Lecture		
Attendance (**5 points**/day) and quizzes (**90 points** during lecture):		**190 points**
eCampus		
eCampus- quizzes (will be taken in eCampus)	6 x 20 points	**120 points**
Laboratory		
Lab attendance/Post lab quiz	13 x 20 points	**260 points**
Lab reports	3 x 20 points	**60 points**
Exams		
First Exam	120 points	
Second Exam	120 points	
Final Exam	130 points	
Exams Total		**370 points**
Total points for lecture and lab		**1000 points**

+ potential extra credits (max. 50 points)

Grading (based on total score including extra credits)

A **≥ 900**

B **800-899**

C **700-799**

D **600-699**

F **< 600**

Policies

General Class Rules:

1. Chatting and using phone are not permitted during lecture/lab periods.
2. On time for classes. Otherwise you may lose points from quiz.
3. Send email formally with your name.
4. Exams begin at 8 am and can be finished in 50 minutes.

Late Policy: NO MAKE-UP QUIZZES OR EXAMS WITHOUT ADVANCE NOTIFICATION WITH DOCUMENTS.
Assignments turned in within one week after the due date will be accepted for 50% of the original credit.

Academic Dishonesty Policy: Professionalism and high ethical standards are required. Plagiarism, academic dishonesty, or other violations of WVU policies will not be tolerated and will be prosecuted as provided in the WVU Student Conduct Code. Sanctions may include reduction in grade, assignment of additional work, a grade of Unforgivable Failure (UF) for the course, or University suspension or expulsion. Every instance of dishonesty for which sanctions are assigned will be reported to the WVU Office of Student Judicial Affairs.

Prohibited electronics: Use of cell phones, pagers, calculators, i-pods or other electronic data devices is prohibited during Quizzes and Exams. Basic arithmetic skills are required.

Social Justice: West Virginia University is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual preference, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (293-6700).

Course Description

PLSC 206 is the introductory course for students interested in plants for food, feed, fuel, fiber, and medicine. No previous plant studies are required.

The course is part of WVU's General Education Curriculum Basic Math and Scientific Inquiry, Objective 2.

Student will learn:
- plant cell biology
- plant morphology, anatomy and its function
- plant physiology and basic plant biochemistry
- effect of environmental factors on plant growth and development
- interactions of plants with their biotic environment
- basics of plant genetics, breeding and biotechnology

Whenever possible the importance of basic findings in plant biology and plant sciences for practical applications in agriculture, forestry, environmental protection, medicine and biotechnology will be discussed.

Expected Learning Outcomes

Upon completion of this course, students will be able to:

1. Use common lab instruments such as microscopes and others.
2. Grow plants under diverse greenhouse conditions.
3. Collect, document and analyze data from plant science experiments. Postulate and verify hypothesis. Draw conclusions from observations and collected data.
4. Recognize plant tissues making up roots, stems, leaves, flowers, fruits and seeds.
5. Recognize and characterize different types of plant organs in different plant taxa.
6. Describe the developmental processes that form primary and secondary plant growth.
7. Describe basic physiological processes that lead to the production of primary and secondary metabolites in plants
8. Describe how hormones and environmental factors influence plant growth and development.
9. Describe how plants interact with beneficial and antagonistic organisms in their environment.
10. Describe historical, traditional and state-of-the-art approaches how humans grow, utilize and try to improve plants.