

Professional (non-credit) course syllabus
Greenhouse Plant Physiology & Technology
October 3 – December 11, 2016

Instructor:

Dr. Chieri Kubota

Professor, School of Plant Sciences, College of Agriculture and Life Sciences

Email: ckubota@email.arizona.edu

Website: <http://cals.arizona.edu/research/kubota>

Facebook: <https://www.facebook.com/CEPPTLA>

Course Description:

This 9-week non-credit course to be administrated through University of Arizona Outreach College (UAOC) will offer students foundational information on the major greenhouse environmental factors affecting plant growth and development. The contents are equivalent to an upper college level course. Students will understand interactions between plants and their microenvironments, including light penetration and CO₂/H₂O diffusion. Students will learn energy and mass balance of leaves and canopy and correlate these phenomena with plant productivity and related plant physiological mechanisms. Students will learn key micrometeorological principles. Lectures cover controlled environment technologies and practices of plant production in greenhouses and high tunnels.

Objectives:

- Students will gain a general overview of plant responses to greenhouse environmental conditions and will be able to discuss the potential plant responses occurring under cover
- Students will become familiar with the terminology and techniques of greenhouse plant production
- Students will be able to understand plant physiology specific to greenhouse
- Students will gain a sufficient understanding of the basics of energy and mass transfer to understand the plant-environment-system interactions occurring in greenhouse production situations

Target Students:

- Horticultural industry personnel managing plant production
- University research personnel seeking short term training
- University students seeking non-credit course
- International students and industry personnel seeking technical education in English as their second language

Course Prerequisites (recommendation): Undergraduate plant biology

Course Delivery Method (100% online):

The course will be delivered 100% online using eCollege as the platform. In addition, optional online meetings will be scheduled for online live discussion (schedule of **twice** during the course). **Access to high speed internet is required. Participation in the online meetings is optional (not part of completion requirement).**

Lecture Contents:

A typical course module contains podcast video lectures captured during the instructor's course formally taught at the University of Arizona over 2014 - 2015. In addition, there will be a copy of the powerpoint slides as well as a list of recommended side reading materials. Each course module will have a set of quizzes to complete and a discussion forum in which students can post questions and comments to interact with the instructor as well as the other students.

Certificate:

A certificate of completion will be granted to students who complete the course. Access status to the course materials and quizzes will be used to assess the completion of course. **Online meeting participation is optional, but students are encouraged to participate in learning additional topics.**

Course Topics and Schedule:

Week	Release-Completion Date	Topics (modules)	Number of lectures (~60 min)
Week 1	Oct 3-9	Introduction: Overview of controlled environment agriculture	1 lecture
Week 2	Oct 10-16	Plant responses to environmental conditions: Light intensity and quality	2 lectures
Week 3	Oct 17-23	Photoperiodic response	1 lecture
Week 3	Oct 17-23	Gaseous environment	1 lecture
Week 4	Oct 24-30	Wind	1 lecture
Week 4	Oct 24-30	Temperature	1 lecture
Week 5	Date-TBD*	<i>Online discussion #1</i>	--
Week 5	Oct 31-Nov 6	Canopy and aerial microclimates: Leaf and canopy energy balance	2 lectures
Week 6	Nov 7-13	Canopy growth environment	2 lectures
Week 7	Nov 14-20	Root zone environments: Nutrient and irrigation	1 lecture
Week 7	Nov 14-20	Substrate	1 lecture
Break	Nov 21-27	<i>No Class (Thanksgiving holiday week)</i>	--
Week 8	Nov 28-Dec 4	Plant water relation and assimilate translocation: Plant water relation	1 lecture
Week 8	Nov 28-Dec 4	Translocation (sink-source)	1 lecture
Week 9	Dec 5-11	Environment control systems: Greenhouse environments	2 lectures
Week 9	Date-TBD*	<i>Online discussion #2</i>	--
		Course materials can be accessible online up to December 18, 2016	

***Dates and times for online meetings will be decided based on students and instructor geographical locations and availability.**

Fee: \$628 per student

Registration: Course registration site:

<https://ce.arizona.edu/non-credit/greenhouse-physiology-and-plant-technology>