ADVANCEA ACADEMY

Introduction to Greenhouse Environmental Control for Crop Production

January 14 – April 8, 2027 (13 weeks)

Live Q&A and discussion sessions will be held on selected Thursdays 6:00 PM – 8:00 PM (Eastern US)
Missing Thursday sessions will require make-up assignments for Certificate of Completion.

Study weeks	Live Zoom Dates	Themes & Lectures	Format	Recording release date
Theme: Introduction to CEA				
Week 1	**1/14/27**	#1: Introduction to the course; overview of the world-wide greenhouse industry (Kacira)	**Live**	1/15/27
Week 1	**1/14/27**	#2: Greenhouse facilities (low-tech, high-tech and everything in between; construction materials, glazing materials; general layout; growing areas, non-growing areas) (Both)	**Live**	1/15/27
Week 1	**1/14/27**	Live Q&A and discussion (#1-2) with Drs. Kacira and Both	**Live**	1/15/27
Theme: Introduction to greenhouse environment control				
Week 2		#3: Overview of key variables and common sensors used for greenhouse environmental control (Both)	**Recording**	1/15/27
Week 2		#4: Leaf/canopy energy and mass balances (Kubota)	**Recording**	1/15/27
Week 3		#5: Greenhouse energy and mass balances (Kubota)	**Recording**	1/15/27
Week 3		#6: Types of control approaches (PID, anticipatory, speaking plant, artificial intelligence) (Kacira)	**Recording**	1/15/27
Week 4		#7: Sensing from a distance (e.g., leaf temperature, fluorescence, plant stress) (Kacira)	**Recording**	1/15/27
Week 4	**2/4/27**	Live Q&A and discussion (#3-7) with Drs. Both, Kubota, and Kacira	**Live**	2/5/27
Theme: Key environmental parameters, methods of control, and plant responses				
Week 4		#8: Temperature: Important temperatures (air, leaf, root, daily average, daily integral, day/night) (Both)	**Recording**	2/5/27
Week 5		#9: Temperature: Methods of control: Heating, heat conservation, cooling and ventilation systems (Both)	**Recording**	2/5/27
Week 5		#10: Temperature: Plant responses to important temperatures (Kubota)	**Recording**	2/5/27
Week 6		#11: Light/radiation:	**Recording**	2/5/27

		Important components of light (intensity, integral, spectrum, photoperiod, uniformity); light transmission; Radiation Temperature Ratio (Both)		
Week 6		#12: Light/radiation: Methods of control: Supplemental lighting and shading (Both)	**Recording**	2/5/27
Week 7		#13: Light/radiation: Plant responses to light/radiation (Kubota)	**Recording**	2/5/27
Week 7	**2/25/27**	Live Q&A and discussion (#8-13) with Drs. Both and Kubota	**Live**	2/26/27
Week 7		#14: Humidity: Determining humidity (psychrometrics, relative humidity, absolute humidity, vapor pressure difference, vapor pressure deficit) (Kacira)	**Recording**	2/26/27
Week 8		#15: Humidity: Methods of control: Humidification and dehumidification (Ling)	**Recording**	2/26/27
Week 8		#16: Humidity: Plant responses to humidity (growth, wilting, diseases) (Kubota)	**Recording**	2/26/27
Week 9		#17: Carbon dioxide and other gases: Delivery systems, methods of control including CO_2 (Both)	**Recording**	2/26/27
Week 9		#18: Carbon dioxide and other gases: Plant responses to carbon dioxide enrichment (Kubota)	**Recording**	2/26/27
Week 9	**3/11/27**	Live Q&A and discussion (#14-18) with Drs. Kacira, Ling, Kubota, and Both	**Live**	3/12/27
Week 10		#19: Irrigation and fertigation: Delivery systems and their methods of control (Both)	**Recording**	3/12/27
Week 10		#20: Irrigation and fertigation: Plant responses to irrigation and fertigation (pH, EC, nutrient concentrations, deficit irrigation) (Kubota)	**Recording**	3/12/27
Week 11		#21: Air circulation/airflow Delivery systems for proper air circulation/airflow (Kacira)	**Recording**	3/12/27
Week 11		#22: Air circulation/airflow Plant responses to air circulation/airflow (Kubota)	**Recording**	3/12/27
Week 11	**3/25/27**	Live Q&A and discussion (#19-22) with Drs. Both, Kubota and Kacira	**Live**	3/26/27
Theme: Dutch greenhouse environment control and strategies				
Week 12		#23: Controlling sinks and sources in fruiting crops (Kubota)	**Recording**	3/26/27

Week 12		#24: Creating environmental conditions for optimized crop responses (Priva: TBA)	**Recording**	3/26/27
Week 13		#25: Commercial practices of irrigation/fertigation recirculation management (Priva: TBA)	**Recording**	3/26/27
Week 13		#26: Upcoming and future innovative CEA technologies (Kacira)	**Recording**	3/26/27
Theme: Economics				
Week 13		#27: Costs and benefits of environmental control (Both and Signorini)	**Recording**	3/26/27
	4/8/27	Live Q&A (#23-27) and wrap-up discussion with Drs. Kubota, Kacira, Both, and Signorini	**Live**	4/9/27