

2019 Five-day Introductory Training Course on Plant Factory with Artificial Lighting (PFAL)

September 23rd – 27th, 2019



In response to increasing global demands from indoor farmers, researchers and future entrepreneurs in the exciting emerging field of plant factory with artificial lighting (PFAL), also known as vertical farm, this coming September, Japan Plant Factory Association (JPFA) together with Chiba University will host again an intensive five-day introductory training course in English on PFAL.

Since 2010, JPFA and Chiba University have been organizing various in-depth and practical sessions, including introductory to advanced courses. This five-day introductory session in English, held September 23rd - September 27th, covers what you would need to know before or after starting PFAL business or research. The sessions will be interactive academic and practical classes, covering topics such as structure and function of PFAL, environmental control, lighting, plant physiology, nutrient solutions, seedlings, recent new technologies toward next generation PFALs, and business case studies of commercial large-scale PFALs. In addition to lectures by academic professionals and PFAL representatives, optional excursions to some commercial PFALs on the last day of the course will be organized.

*The curriculum would be the same as the introductory course last year.

1. Objective and Goal

-To offer foundation for theory and experience-based practice, with a view to foster academic and industrial development toward next generation PFAL.

-To facilitate development and dissemination of technically and economically sustainable PFAL, through providing the firsthand technical and conceptual classes by broad-ranging professionals in practice from both academia and PFAL industry.

2. Target group: Who would attend?

Motivated current/potential indoor farmers who plan to start or just started PFAL business or research. They will gain understandings of elementary theory and practice of PFAL, basic knowledge of cultivation and operational management, and keys for business success, etc.

3. Lecturers and program

■ Scheduled Lectures :

Chiba University / JPFA:

T. Kozai, Y. Shinohara, T. Maruo, S. Tsukagoshi, N. Lu, M. Takagaki, T. Yamaguchi, O. Nunomura and E. Hayashi

Lecturers from the PFAL industry: Representatives from 808 Factory and others(K. Kai and K.Uraisami)

■ Scheduled Program (The schedule is subject to change without notice.)

	Class Unit	Topics
General	Current global situation	Plant factory with artificial lighting (PFAL) in the world
	Current PFALs	Current cultivation systems and protocols, characteristic of LEDs, issues to be solved and/or improved
	Meanings of basic technical terms for understanding the lectures	Units of photon (mol) and energy (J or kWh), photosynthetic photon efficacy of LEDs, PPF (photosynthetic photon flux density), EC (electric conductivity), VPD (vapor pressure deficit), net photosynthetic and transpiration rates, etc.
	Environment and sanitary control units	Layout and functions of facilities in cultivation room, environment and sanitary control units, improvement of light energy use efficiency and light distribution

Environmental effects on plant	Photosynthesis, respiration and transpiration of plants	Basics of photosynthesis, respiration and transpiration, effects of environmental factors on photosynthesis, etc.
physiology and growth	Light environment and plant growth	Effect of light environment on plant growth and quality of produce
Nutrient solution in hydroponics	Plant nutrition related with nutrient and water uptake	Uptake of nutrient and water, and transpiration functions of water and nutrition in plants, physiological disorders and avoidance methods
	Basis of hydroponic cultivation	Nutrient solution composition and management, typical physiological disorders such as tip burn
Cultivation production	Cultivation management (seeding to precooling)	Seeding, transplanting, harvesting, post-harvest processing, pre-cooling
Forthcoming technologies		Phenotyping, artificial intelligence, time shift lighting, automation/robots, renewable energy use, breeding of plants suited to PFALs
Business	Starting PFAL/vertical farming business	For sustainable PFAL business, reduction of running costs, production of high value plants, marketing and creation of business model
	Activities at Chiba University and JPFA	
	Onsite tour	Kashiwanoha Campus, Chiba University
	Q&A Session	
Excursion	Commercial PFAL tour	(Field trip to commercial PFALs)

*Upon completion of the course, we will issue a Certificate of Completion to all qualified lecture attendees.

4. Guidelines for Applicants

■ **Date : 2019. 9.23 Mon - 9.27 Fri**

*On the first day (2019.9.23), the reception and classes are scheduled to start in the morning.

On the last day (2019. 9.27), **the optional excursion will be held in the greater Tokyo area and is scheduled to finish at approximately 16:00**

(Detail schedule will be announced once fixed.).

■ **Location :**

6-2-1 Kashiwanoha, Kashiwa, Chiba, JAPAN 277-0882

Center for Environment, Health and Field Sciences, Chiba University

Japan Plant Factory Association (Building A 1F Meeting Room)

*Kashiwanoha Campus is located less than 1 hour from Tokyo by train. There are several accommodations nearby.

We will provide information after you apply.

■ **Fee :**

JPFA member JPY115,000/person

JPFA Non-member JPY145,000/person

Includes materials for lectures and the transportation fee on the excursion day.

Lunch is not provided, however there are many options in walking distance including a shopping mall food court and grocery store.

**We will issue the invoice via PayPal after receiving the application form.

If you prefer to send the fee via wire transfer, please let us know. The payer will be responsible for any bank charges incurred for processing wire transfer.

5. How to apply

■ **Registration :**

You can access the application form [here](#).

*Seats will be filled in the order that applications are received.

After applying, you will receive the invoice within 7 to 10 business days. After confirming your payment, your seat will be reserved and we will provide your confirmation booking number.

If your payment can not be made within 5 business days after receiving the invoice, your reservation may be cancelled automatically.

■ **Deadline for registration:**

August 23rd or when the capacity is filled.



■How to be a member:

Please fill in the [application form \(PDF\)](#) and send it to us.

For reference, click [here](#).

If you have any questions, please feel free to contact [us](#).

Head Office

JPFA | JAPAN PLANT FACTORY ASSOCIATION

Center for Environment, Health & Field Sciences of Chiba University

6-2-1 Kashiwa-no-ha Kashiwa, Chiba 277-0882 JAPAN

Tel:+81-4-7137-8318 Email:training@npoplantfactory.org.