The Japan Plant Factory Association is offering a new online training course on plant factories with artificial lighting (PFALs) in English on Feb. 18-March 11, 2021, after the first such course in 2020 drew wide interest.

The JPFA is responding to calls from indoor farmers, researchers, business planners and other interested people for lessons on PFALs, also known as vertical farms. Since 2010, the JPFA and Chiba University have organized various in-depth and practical learning events including introductory and advanced training courses.

**Course Features**
The coming course will comprise introductory classes on PFALs and special content designed for participants to acquire practical knowledge and expertise.

The introductory course will have academic and practical classes on such topics as current PFALs and forthcoming technologies as well as environmental effects on plants. Special content will cover such issues as practical methods. For details, see the program below.

We will also provide participants with a virtual tour to a commercial, large-scale PFAL and exhibitions by companies in the PFAL and related businesses.

All lectures are prerecorded ones, but attendees can send any questions via a specified app. We are planning to hold a live Q&A session to answer these questions. The Q&A session will certainly be a great opportunity for participants to exchange views and deepen their understanding.

Never forget another important thing. While attendees cannot get together as in on-site courses, the app allows them to interact each other and with representatives of exhibitor companies.

On completion of the course, we can issue a certificate of participation if you need.

Jan. 20, 2020
Objective and Goal

- To offer the foundation for theory and experience-based practices, with a view to fostering academic and industrial development of next-generation PFALs.
- To facilitate development and dissemination of technically and economically sustainable PFALs, by providing first-hand technical and conceptual classes by a variety of professionals in practice in both academia and the PFAL industry.

What Participants Say

Here are comments by participants in the 2020 Introductory Training Course on PFALs.

"The most useful time spent in Covid-19 pandemic." (A participant of Romania)
"Thank you so much for the opportunity to see into this ‘world,’ which is likely to reshape our future soon." (The same participant)

"Very valuable and useful information for those who wish to learn about PFALs." (A participant of Saudi Arabia)

"Learned so much from every perspective, from cultivation, to the business side of things, and even a preview into already successful plant factories." (A participant of Malaysia)

"Lectures were interesting, and definitely felt the effort everyone put into making this online training a success. Makes me really want to visit when the pandemic is finally over in the future." (The same participant)
Lecturers and Classes

- Lecturers (in alphabetical order of family names)
  - Chiba University/JPFA: Eri Hayashi, Toyoki Kozai, Na Lu, Toru Maruo, Osamu Nunomura, Yutaka Shinobara, Satoru Tsukagoshi
  - The Ohio State University: Chieri Kubota
  - The University of Tokyo: Wei Guo
  - Lecturers from the PFAL industry: Katashi Kai (Shinnippou Ltd.--808 Factory), Kazuya (Kaz) Uraisami (marginal LLC)

Program

Introductory Classes

<table>
<thead>
<tr>
<th>Category</th>
<th>Class Name</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Current Global Situation</td>
<td>Plant factories with artificial lighting (PFALs) in the world</td>
</tr>
<tr>
<td></td>
<td>Current PFALs</td>
<td>Current cultivation systems and protocols, the characteristics of LEDs, issues that remain to be solved and/or improved</td>
</tr>
<tr>
<td></td>
<td>Principles, Structure and Environmental Control of PFALs</td>
<td>Meanings of basic technical terms for understanding the lectures, introduction to technical concepts and system design of PFALs</td>
</tr>
<tr>
<td>Environmental effects</td>
<td>Photosynthesis, Respiration and Transpiration of Plants</td>
<td>The basics of such matters as photosynthesis, respiration and transpiration, and effects of environmental factors on photosynthesis</td>
</tr>
<tr>
<td></td>
<td>Light Environment and Plant Growth</td>
<td>Effects of a light environment on plant growth and the quality of produce</td>
</tr>
<tr>
<td>Nutrient solution</td>
<td>Basis of Hydroponic Cultivation and Nutrient Solution</td>
<td>Nutrient solution composition and management</td>
</tr>
<tr>
<td></td>
<td>Plant Nutrition related with Nutrients and Water Uptake</td>
<td>The uptake of nutrients and water, function of transpiration, physiological disorders such as tip burn, and avoidance methods</td>
</tr>
<tr>
<td>Cultivation</td>
<td>Cultivation Management</td>
<td>Seeding, transplanting, harvesting, post-harvest processing, and precoring</td>
</tr>
<tr>
<td></td>
<td>Cultivation Processes Demonstrated</td>
<td>Expert demonstration of cultivation processes</td>
</tr>
<tr>
<td></td>
<td>Hydroponic Crop Production: Leafy greens - Microgreens and Baby Greens</td>
<td>Hydroponic crop production methods on microgreens and baby greens</td>
</tr>
</tbody>
</table>
Business Administration of PFALs

Basic concepts of efficiency, productivity, and profitability, and simulation practices with business administration sheets

Case Study of Commercial Large-scale PFAL: 808 Factory

How 808 Factory operates: pursuit of sustainable PFAL business, reduction of running costs, production of high-value plants, marketing and business model creation

Future developments

Forthcoming Technologies

Phenotyping, artificial intelligence, time shift lighting, automation and robots, renewable energy use, and breeding of plants suited to PFALs

Virtual tour

Virtual Tour inside PFAL

A virtual tour inside an automated PFAL

Q&A Session

Time for lecturers to answer questions on their classes from participants

### Special Content

<table>
<thead>
<tr>
<th>Category</th>
<th>Class Name</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology</td>
<td>Phenomics and Potential of Phenotyping</td>
<td>Phenomics, phenotyping and their possible application to PFALs</td>
</tr>
<tr>
<td></td>
<td>Hands-On Technical Training on PFAL Business Management</td>
<td>In-depth study of PFAL business administration</td>
</tr>
<tr>
<td></td>
<td>Tailored, Further Explanations on Previous-Course Lectures</td>
<td>Important questions in previous courses answered one by one</td>
</tr>
<tr>
<td>Business</td>
<td>A Close Look inside a Large-Scale Commercial PFAL</td>
<td>A virtual tour inside a commercial, large-scale PFAL in central Japan</td>
</tr>
<tr>
<td></td>
<td>Operational and Hygiene Management, Future of PFALs in COVID-19 Times</td>
<td>A workshop held in 2020 to discuss coping with challenges posed by the COVID-19 pandemic</td>
</tr>
</tbody>
</table>

Notes: The classes are subject to change without notice.

### Specified App—Swapcard

The course uses the Swapcard platform, which allows participants to easily connect and network with each other. The Swapcard app is available on personal computers as well as iPhone and Android.

After the registration, you will receive an email a few days before the start of the training that will give information on how you can access the training site.
Potential Audience

The course is targeted at enthusiastic current and prospective indoor farmers who plan to start or have started PFAL operations or research. It will offer elementary theory and practice of PFALs, basic knowledge of cultivation and operational management, and keys to business success.

The alumni of the JPFA training courses in 2018, 2019 and 2020 are welcome to join the new course.

The following is the fees for the course, which combines an introductory course and special content. Applicants who have not joined JPFA English-language training courses before need to take at least the introductory course, but the alumni can choose special content alone.

<table>
<thead>
<tr>
<th>Category</th>
<th>Choice</th>
<th>JPFA member</th>
<th>Non-member</th>
<th>What is included</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-time attendees</td>
<td>Introductory Course Only</td>
<td>JPY 35,000</td>
<td>JPY 65,000</td>
<td>Viewing lecture videos, downloading lecture files, attending virtual exhibitions and joining other course events.</td>
</tr>
<tr>
<td></td>
<td>Introductory Course + Special Content</td>
<td>JPY 65,000</td>
<td>JPY 100,000</td>
<td>Same as above. *In a planned Q/A session, questions of first-time attendees are supposed to be given priority over alumni ones.</td>
</tr>
<tr>
<td>Alumni of 2018, 2019, 2020 courses</td>
<td>Introductory Course Only</td>
<td>JPY 10,000</td>
<td>JPY 15,000</td>
<td>Same as above. *In a planned Q/A session, questions of first-time attendees are supposed to be given priority over alumni ones.</td>
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<tr>
<td></td>
<td>Special Content only</td>
<td>JPY 30,000</td>
<td>JPY 35,000</td>
<td>Same as above. *In a planned Q/A session, questions of first-time attendees are supposed to be given priority over alumni ones.</td>
</tr>
<tr>
<td></td>
<td>Introductory Course + Special Content</td>
<td>JPY 40,000</td>
<td>JPY 50,000</td>
<td>Same as above. *In a planned Q/A session, questions of first-time attendees are supposed to be given priority over alumni ones.</td>
</tr>
<tr>
<td>Exhibitors</td>
<td>JPFA organizational members/organizations with participants in the 2021 training course</td>
<td>JPY 100,000</td>
<td>Networking and attending virtual exhibitions. Exhibitors upload digital content (e.g., videos, images, documents).</td>
<td></td>
</tr>
</tbody>
</table>
Registration

After receiving the application form, we will confirm your application category before starting the payment procedure.

▶ First-time attendees: Click [here](https://select-type.com/e/?id=j37IlyKOTG0).

▶ The alumni of the training courses in 2018, 2019 and 2020:
Visit the URL in the email to be sent to all the alumni.

▶ Exhibitors: Click [here](https://select-type.com/ev/?ev=UMXleQyta7c).

*Any organization where an applicant or applicants for the 2021 course belong is eligible to become an exhibitor on the course, in addition to JPFA organizational members.

Once your application for credit card payment is approved, credit card payment will be made immediately, and you will automatically get a receipt via Stripe.

If you have selected "pay via wire transfer" as your payment option, we will send you an invoice separately soon. After your payment by a wire transfer is completed, we will email you to confirm the receipt of your payment.

You will receive an invitation email a few days before the training course starts.

**Schedule**

**First-time Attendees and Alumni**

(1) Each applicant will receive an email on the training app a few days before the training starts.

(2) Course content will become accessible on Feb.18, 2020.

(3) A Q&A session is tentatively planned for early March 2021.

*You will receive necessary notifications after the course starts.

**Exhibitors**

On completion of the registration, we will inform you of the procedure.

**Cancellation Policy**

If any participant cancels the training course on/before Jan. 18, 2021, we will return the fee except for the cancellation fee of 15% of the payment. If the cancellation is made on/after Jan. 19, 2021, the fee shall be paid in full.

Instead of canceling, first-time attendees and the alumni can transfer their registration to another person without penalty on/before Feb. 10, 2021.
Japan Plant Factory Association

The Japan Plant Factory Association, a nonprofit organization founded in 2010, is devoted to advancing the plant factory industry and controlled-environment agriculture in and outside Japan through academia-industry collaborations.

Its mission is to develop and disseminate sustainable plant factory systems in a bid to address issues concerning food, the environment, energy and natural resources.

The JPFA oversees plant factories on the Chiba University Kashiwanoha campus in Kashiwa, northeast of Tokyo. Also, it works on about 20 R&D projects and runs workshops and training courses.

How to Become a JPFA Member
Apply for JPFA membership here.
For more information, visit the JPFA website or email us at training@npoplanfactory.org. We welcome your inquiries.

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