Syllabus: HCS 8830
‘Current research topics on controlled environment plant physiology and technology’

Credit hours: 1
Semester to offer: Summer II 2021

Instructor information:
Instructor: Chieri Kubota
Office: 330 Howlett Hall
Email address: kubota.10@osu.edu
Phone number: 614-292-3175
Office hours: Walk-in or Zoom by appointment

Location and Time: [Fridays 3:00 – 5:00 PM]
Location: Zoom and course website

Course description:
Students will learn key concepts and research status of controlled environment agriculture. Each student will review a selected recent research publication, with focus on plant physiology and controlled environment technology. Students will evaluate the contents analytically and synthesize the information to present to other peer students in the course and also develop a corresponding impact statement of the finding to better communicate with the relevant industry stakeholders. The goal of this course is to get the most up-to-date understanding of the controlled environment crop physiology research and communicate the impact effectively in a public space.

Course learning outcomes
- Become familiar with the current research status of applied plant physiology under controlled environment
- Become familiar with the current and potential technological applications of applied plant physiology under controlled environment
- Develop skills of analytical thinking through evaluating methods and results reported in peer-reviewed journal papers
- Learn how to translate scientific findings and potential impacts in layman’s language.

Course Technology
Should you need assistance with technology, please contact the IT Resources for Students webpage: https://ocio.osu.edu/audience/students/; phone: 614-688-4357

Baseline technical skills necessary for this course are:
- Basic computer and web-browsing skills
- Navigating Carmen
Necessary equipment is:
- Computer with high-speed internet connection
- Microphone and webcam for online meetings

Course Structure
This course will take a journal club style with more emphasis on writing and public communication of science. Each meeting, the instructor will provide an overview of the selected topical area and its research trend. Then, one student (or a team of students) will give a presentation of a selected paper (published within past 5 years, with some exceptions such as a well-reputed milestone work in the field) for the class to describe 1) background, 2) problem statement, 3) hypothesis, 4) approach, and 5) findings. This initial meeting will be used for everyone to understand the work in detail. The presenter(s) will also write up a blog about the paper to post in our course blog website (http://u.osu.edu/ceatalk). In addition to the blog, the presenter(s) must include discussion threads (a minimum of two) to facilitate the discussion over the following week after posting the blog. The rest of class is required to read the paper (prior to the meeting), ask the week’s presenter for clarifications, and respond to the blog discussion threads. When a paper is presented by a team of students, primary and secondary reviewers can be assigned, and the blog article needs to be reviewed and edited by all team members before posting.

How to select a research paper for the journal club
Prior to the course, the instructor will suggest several candidate papers that students can select from. These papers are typically from journals in the areas of horticultural sciences and applied engineering. Alternatively, students can find papers and suggest the instructor for her approval. A paper needs to be selected and shared with the rest of class at least one week prior to the presentation date.

What to write in the blog
Each presenter (or presenting team) will be required to write a blog about the paper they have selected. If the paper is team-presented, then the blog will be developed collaboratively by the team also. This blog is intended to communicate with non-academic professionals (industry growers or R&D personnel). The blog site is a real site publicly accessible, managed by the class. Some key points to develop a high quality blog are:

1) Keep the length between 500 – 1000 words.
2) Keep the language understandable by high school students (layman’s language).
3) Focus on positive aspects in the blog (negative criticisms are discussed in the meeting). If there are issues that need to be discussed, they can be in the threads instead of blog body. Keep in mind that this blog is a real communication platform with our stakeholders possibly including the original authors or author group.
4) Describe why the work is important and how the work contributes to moving the field forward.
5) Avoid acronyms and jargon.
6) Include the link for the original journal page for the paper. If you wish to include a photo or graphics in your blog, contact the journal office to get permission and include the appropriate reference information under such copy-righted materials.

**Grades**
Student’s final grade will be based on 100 points total, consisting of Zoom meeting participation (30 points = 5 x 6 meetings); paper presentation (20 points); blog (20 points); blog discussion participation (30 points = 5 x 6 blogs).

<table>
<thead>
<tr>
<th>Evaluation items</th>
<th>Dates</th>
<th>Points</th>
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<tbody>
<tr>
<td>Participation in meeting discussion</td>
<td>All meetings</td>
<td>30</td>
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<tr>
<td>Presenting a selected paper</td>
<td>Assigned date</td>
<td>20</td>
</tr>
<tr>
<td>Writing a blog</td>
<td>Assigned date</td>
<td>20</td>
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<tr>
<td>Participation in blog discussion by writing comments</td>
<td>All blogs</td>
<td>30</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100</td>
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**Grading scale**
This course will be graded based on the total points earned as a percentage of total points possible and letter grades are assigned as follows:

- 93–100: A
- 90–92.9: A-
- 87–89.9: B+
- 83–86.9: B
- 80–82.9: B-
- 77–79.9: C+
- 73–76.9: C
- 70 –72.9: C-
- 67 –69.9: D+
- 60 –66.9: D
- Below 60: E

**Course schedule (subject to change)**

<table>
<thead>
<tr>
<th>Weeks and dates</th>
<th>Location</th>
<th>Contents</th>
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<tbody>
<tr>
<td>Week 1 (Jun 25)</td>
<td>Zoom</td>
<td>Pre-course business meeting; Overview of CEA, terminology and key persons (Chieri Kubota)</td>
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<tr>
<td>Week 2 (Jul 2)</td>
<td>Zoom</td>
<td>Optimizing light quality for plant growth 1 (LED lighting) (Kubota)</td>
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<td>First paper presentation &amp; submission of the blog #1</td>
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<tr>
<td>Week 3 (Jul 9)</td>
<td>Zoom</td>
<td>Optimizing light quality for plant growth 2 (greenhouse glazing) (Kubota)</td>
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<td>Second paper presentation &amp; submission of the blog #2</td>
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<tr>
<td></td>
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<td>Completing the discussion for blog #1</td>
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<tr>
<td>Week</td>
<td>Time</td>
<td>Platform</td>
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<td>Week 4 (Jul 16) 3-5 PM</td>
<td>Zoom</td>
<td>Computational approach for greenhouse climate management (Kubota) Third paper presentation &amp; submission of the blog #3</td>
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<tr>
<td>Week 5 (Jul 23) 3-5PM</td>
<td>Zoom</td>
<td>Transplant production in CEA (Kubota) Forth paper presentation &amp; submission of the blog #4</td>
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<tr>
<td>Week 6 (Jul 30) 3-5PM</td>
<td>Zoom</td>
<td>Automation in CEA (Kubota) Fifth paper presentation &amp; submission of the blog #5</td>
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<td>Aug 6</td>
<td>N/A</td>
<td>None</td>
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