

# CHCA Intercession 2020

January 6-17, 2020

Course Description for: *The Science of Aquaponics: Plant Biology, Chemistry, and Microbiology*

Instructors: **Kevin Savage and Gary Delanoy**

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Course Type: <b>Local Day (Greater Cinti Area)</b>	Service Hours: <b>10</b>
Maximum enrollment: <b>24</b>	Minimum enrollment: <b>6</b>
<b>Cost:</b>	\$ 150

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**Overview:**

This Intercession experience will allow students with an interest in science, and aquaponics to explore the science behind aquaponics (and by extension, natural ecosystems) utilizing the CHCA greenhouse and attached laboratory. Students will experience two weeks of hands-on laboratory and greenhouse activities associated with successful operation of aquaponics growing systems. The activities will include plant biology, chemistry, and microbiology. To emphasize the “service” nature of sustainable agriculture at CHCA, students will engage in seeding, planting, and harvesting activities associated with the CHCA Eagle Farm production aquaponic system, and will earn service hours for this portion of the Intercession experience.

**Course Goals:**

- Reinforce concepts learned in core science curriculum classes, with an emphasis on lab and food safety;
- Gain experience utilizing new lab techniques and methods developed for use in the CHCA greenhouse;
- Utilize hand-on activities to emphasize the cross-disciplinary nature of applied life and physical sciences;
- Experience the variety of tasks necessary for the day-to-day and week-to-week operation of an aquaponic production farm system.

**Reading Component:**

Focused reading list to be provided to enrolled students at the beginning of the 2019-2020 academic year. There will also be daily, short reading assignments during the course.

**Writing Component:**

Students will be expected to complete activities including worksheets and abbreviated lab reports as a part of the daily activities. Additionally, students will keep daily records of activities such as water quality monitoring. There will be no requirement for individual daily journals or reflections.

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January 6-17, 2020

Course Description for: ***The Science of Aquaponics: Plant Biology, Chemistry, and Microbiology***

## **Description:**

This Intercession experience will allow students who have an interest in (1) applied science, (2) aquaponics and sustainability, and (3) working in the CHCA greenhouse to explore the science behind aquaponics (and by extension, natural ecosystems) to learn in the CHCA greenhouse and attached laboratory/classroom structure. Students will experience two weeks of hands-on laboratory and greenhouse activities associated with successful operation of aquaponics growing systems, and contemporary aquaponics research. The activities will include plant biology (seeds, germination, photosynthesis & cell respiration, fruiting/non-fruiting, harvesting, seed saving), chemistry (water quality chemistry, biogeochemical cycling, micro- and macronutrients), and microbiology (biological lab safety procedures, plant-growth promoting microbes, microbes in aquaponics systems). To emphasize the “service” nature of sustainable agriculture at CHCA, students will engage in seeding, planting, and harvesting activities associated with the CHCA Eagle Farm production aquaponic system, and will earn service hours for this portion of the Intercession experience.

## **Typical Day Schedule:**

- 8:00 am Attendance & Overview of days activities & responsibilities
- 8:15 - 9:15 **Topic Discussion:** Plant Biology – Parts of a seed, parts of a plant, seed to harvest
- 9:15 - 9:30 Break
- 9:30 – 11:00 **Lab Activity:** Parts of a Seed (microscope analysis), **Lab Activity:** Seed Germination & Seedling Parts (microscope analysis)
- 11:00 – 11:30 **Topic Discussion:** Plant Processes – Photosynthesis/Cell Respiration
- 11:30 - 12:00 **Lab Activity:** Stems & Leaf Anatomy (microscope analysis)
- 12:00 - 1:00 pm Lunch (on your own)
- 1:00 – 1:45 **Topic Discussion:** Nutrients in Plants & Transportation in Plants
- 1:45 – 2:45 **Lab Activity:** Rate of Transpiration Activity (CHCA Eagle Farm Production System)
- 2:45 - 3:00 Debrief of day and day’s activities

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### **This course is well suited to:**

Students who have an interest in (1) applied science, (2) aquaponics and sustainable, and (3) working in the CHCA greenhouse to explore the science behind aquaponics, but may not have the opportunity to complete the year-long aquaponics course offering. Because of the level of engagement with biology and chemistry, this course may be challenging for 9<sup>th</sup> grade students.

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**Cost:** \$ 150

**Additional Costs:**

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## **Other Information:**

Because of the level of engagement with biology and chemistry, this course may be challenging for 9th grade students.

This course will be held in the CHCA greenhouse on the MSL Upper School campus. The course will begin each day at 8:00 a.m., and should be completed each day by 3:15 p.m.

Students will be working in the greenhouse and attached laboratory; long pants are recommended, and closed toed shoes are required. Protective eyewear may be required for some activities, and will be provided if the student does not have their own eyewear.

Grading will be based, in part, on participation in all activities; students missing activities due to tardiness or absence will be expected to make up the activities missed.

There is a possibility of a field trip on one day of the course; transportation for the students will be provided.

Students will be responsible for their own lunch each day, and may purchase lunch in the school cafeteria or bring their own lunch.