

Aquaponics

Course Syllabus

Teacher: Jacob Paciotti

Contact Information:

Email: jpaciotti@coventryct.org

Phone: 860-742-7346 x4098

Welcome to Aquaponics!

This year-long aquaponics course covers much of the same concepts as a college-level introductory Botany (plant science) course, while also covering sustainable agriculture, hydroponics, and aquaponics! During Semester 1, much of the course's focus will be on foundational botanic concepts, including plant taxonomy & diversity, plant anatomy & physiology, plant growth & genetics, plant ecology, horticultural practices, and soil science. Additionally, students will have the opportunity to grow plants in the Science Department Greenhouse.

In semester 2, the course's focus will shift to application of these concepts to our Aquaponics growing systems in the Science Department courtyard and hallway. Students will learn about the different types of hydroponic and aquaponic growing systems, learn how to set them up and operate them, and then compare their sustainability to traditional agriculture. The course will culminate in a final greenhouse and aquaponics system engineering design task where students will pull on everything that they have learned to design and build a model of a theoretical greenhouse with an aquaponics growing system inside.

MISSION STATEMENT

The mission of this course is to help you develop a fundamental understanding of basic botanical principles, agricultural sustainability, and aquaponics/hydroponics systems. This course will also provide you with skills and knowledge that can be applied in the horticulture and agricultural fields after high school.

MAJOR GOALS

- Become more skillful and independent scientific thinkers
- Become competent in basic plant science and horticulture
- Identify reasons why the study of science, specifically plant science and aquaponics, matters to global citizens
- Master the basic concepts of how to design and run an aquaponics system, and how to promote plant and fish health
- Learn about potential career paths in the Botany and Horticulture fields

COURSE UNITS

- 1.) Plant Taxonomy & Diversity
- 2.) Plant Anatomy & Physiology
- 3.) Plant Growth & Genetics
- 4.) Horticulture & Cultivation
- 5.) Soil Science
- 6.) Introduction to Aquaponics & Hydroponics
- 7.) Soilless Growing Requirements & System Upkeep
- 8.) Careers in Plant Science

Unit	Topics Covered	Estimated Time Frame (Subject to Change)
Plant Taxonomy & Diversity	<ul style="list-style-type: none"> - General Taxonomy - Binomial nomenclature - Plant families and genera - Native plant identification - General plant ecology - Invasive plant ecology 	August 28 - October 15
Plant Anatomy & Physiology	<ul style="list-style-type: none"> - Plant cell structure & function - Leaf structure & function - Flower structure & function - Phototropism & gravitropism - Seed structure & physiology - Seed shape & dispersal 	October 16 - November 15
Plant Growth & Genetics	<ul style="list-style-type: none"> - Plant growth hormones & regulators - Space requirements - Light requirements & photoperiodism - Nutrient requirements - Micronutrients & macronutrients - Classical pea genetics - Genetic Modification of Crops 	November 16 - December 15
Horticulture & Cultivation	<ul style="list-style-type: none"> - Plant pruning - Grafting - Propagation - Plant tissue culture 	December 15 - January 12
Soil Science	<ul style="list-style-type: none"> - Soil horizons - Soil typing - Soil pH 	January 19 - February 15
Introduction to Aquaponics & Hydroponics	<ul style="list-style-type: none"> - History of agriculture - Types of hydroponics & aquaponics systems - Current issues facing traditional agriculture - Traditional agriculture vs. sustainable agriculture 	February 16 - April 10
Soilless Growing Requirements & System Upkeep	<ul style="list-style-type: none"> - Nutrient cycles - Fish selection - Plant selection - Water chemistry 	April 11 - May 15

Careers in Plant Science	<ul style="list-style-type: none"> - Careers in agriculture - Careers in horticulture - Careers in research botany 	May 15 - June 3
--------------------------	---	-----------------

CLASSROOM POLICIES

Be present and on task at all times.

- be in your seat when the class period begins.
- keep distractions (phones) put away.
- have all necessary materials on hand.
- keep working until the end of the class period.

Be respectful of each other, yourself, our materials, and our space.

- comments toward others must be useful.
- return all materials in the same condition.
- leave your space as clean (or cleaner) than it was when you entered.

Be an active, positive contributor to our class.

- come prepared for class.
- ask questions when you have them.
- listen to the comments and questions of others.
- provide positive feedback to classmates.

Absence Policy: If a student is absent, **it is their responsibility to turn in any and all missing assignments.** Extra copies of the assignment will be available online in Google Classroom, and/or will be available in-person in room 98. If the student expects to be absent for a school-approved absence, make-up work can be requested at a minimum of 24 hours (1 day) prior to the absence.

Cell Phone Policy: Per Science Department policy, all cell phones are expected to be put into the classroom cell phone pockets upon entering the science classroom. Cell phones are expected to remain in the cell phone pockets for the entirety of the class, unless otherwise stated by the teacher. Cell phones are expected to be set to silent mode during the class period. Any violation of this policy may result in disciplinary referral.

Plagiarism Policy: Per the Coventry High School Handbook, all students are expected to complete and submit their own assignments. Any unfair assistance from outside sources, copying of material or information from peers, and/or using work from previous students of the class will be considered plagiarism. Any evidence of plagiarism will result in a zero (0) for the assignment, disciplinary referral, and contact to a parent or guardian. If multiple students are involved in plagiarism together, then all parties involved will be subject to the disciplinary actions stated above.

PLEASE NOTE: Although students are encouraged to work with partners on laboratory assignments, laboratory reports, and some classwork assignments, **each student is required to submit their own unique work for each assignment.** If a group assignment is submitted with each student in the group submitting the exact same answers, then all parties involved will receive a zero (0) for the assignment.

Artificial Intelligence Policy (Updated 2025): Artificial intelligence can be defined as any internet-based form of computer-generated intelligence capable of producing information or answers to a user-provided prompt or question. Any student who is found using Artificial Intelligence to assist them in their work, complete their assignments for them, write their papers, or aid in their classwork in any way will receive a zero (0) for the affected assignment, an office referral, parent contact home, and potential additional disciplinary action, as defined by the instructor.

Quizzes, Tests, and Projects: For each unit in the course, students will have one (1) end-of-unit test that is summative of all content covered in the unit. There will be one (1) Semester 1 project due by the start of the Midterm Exam in January and one (1) Semester 2 project due by the start of the Final Exam in June.

Midterm and Final Exams: All students are required to take the Midterm Exam, regardless of their class standing and grade in the course. Seniors with a year average of 85% or lower, and all Juniors, are required to take the Final Exam, per school policy. If a Senior has above an 85% for their year average, they are exempt from taking the Final Exam.

Google Classroom: Google Classroom will be utilized throughout the year for class announcements, to house virtual copies of assignments, and to remind students of upcoming due dates. The majority of assignments will be expected to be turned in on paper, but Google Classroom may be used occasionally to submit assignments.

Powerschool: All assignments will be posted in Power School the same day as they are assigned in class. All grades will be posted within a timely manner (generally within two days of assignment submission).

Parent and Guardian Communication: Most communications to parents will be done over email, with some requiring additional phone calls as needed. If any concerns are raised about a particular student, parents/guardians will be contacted/notified promptly via email and/or phone call. Additionally, any positive behavior by any and all students may be recognized via email communication.

LABS and LAB SAFETY

Due to the nature of the course, it will be necessary for you to be safe when working in the lab. Prior to our first in person lab, you will be required to read, understand, and sign a science safety contract. A parent/guardian must also sign your safety contract so that your family is aware of what we are doing in class. You will also be required to take the lab safety quiz and pass with an 85% or greater before participating in labs.

I will always draw your attention to important safety concerns with each activity we do, and it is expected that you will take ownership for your safety in the lab. This includes:

- following all safety rules during labs
- reading ALL of the directions BEFORE starting a lab
- taking care of the equipment given to you

- making sure your lab station and the area around your desk is spotless before you leave the class. All lab equipment must be washed, dried and returned to its original location.

Failure to meet any of these expectations may cause you to receive a zero (0) on that day's lab.

MAJOR EXPECTATIONS

- 1.) Put in effort and maintain an attitude of respect for yourselves, the teacher, and other classmates.
- 2.) Be kind to those around you, you never know what someone else is going through.
- 3.) Be on time and prepared. It is expected that you will arrive and be in your seat by the time the beginning-of-period bell rings.
- 4.) During morning blocks, students are allowed to get breakfast before class starts, but are expected to return to class within five (5) minutes of class starting. Breakfast can be eaten in the classroom area, but not the laboratory area. Any student who returns more than 5 minutes after the start of class will be marked tardy unexcused, and any student who returns more than 15 minutes after the start of class will be marked absent unexcused.
- 5.) In class, students will be expected to have their Chromebooks at all times.
- 6.) At the end of labs, students are expected to clean up their lab areas and safely dispose of all materials used in the lab, if applicable.
- 7.) Students are responsible for doing their own work. It is expected that students will not plagiarize, cheat, or copy others' work.

COURSEWORK AND GRADING

- Assessments (35%) - Regular tests, quizzes, and check-ins will be given to determine your mastery of fundamental concepts. These will be kept as a portfolio in the classroom/office until the end of the term.
- Classwork/Homework (30%) - Classwork will give you a chance to work collaboratively on course content, and discover and discuss any questions needing clarification before you leave class. Class work includes worksheets and group work that we start in class but sometimes finish at home. Be sure to leave class with a good understanding of the lesson objective so you will be able to complete the homework on your own. Homework will be collected/checked at the beginning of class when the assignment is due. Sometimes I check for completeness, other times I will collect them and check for accuracy. Be sure to show all your work! I cannot give credit for blank space.
- Labs/Projects/Work Days (35%) - Labs and projects will be assigned throughout the course. Data collection for a lab is done as a group, but lab write-ups, analysis and conclusion questions will be completed individually. Do not copy from your lab partners, or you will all get zeros! Group projects will include a chance for you to grade yourself and your partners.

MATERIALS

A minimum of following materials will be required daily in order to be considered prepared for class:

- A 3-ring binder to hold all worksheets and material
- Chromebook (charged) & charging cord
- Pencil and Pen

I have read and fully understand the attached policies and procedures and agree to abide by them.

Student Name (Print):

Student signature

Dear Parents/Guardians,

I respectfully request that you also read and sign these policies to ensure that you have the opportunity to share and discuss with your child. Please feel free to email me at jpaciotti@coventryct.org with any comments or suggestions. I welcome and encourage your input and look forward to meeting you on open house night and during conferences.

Parent/Guardian Name (Print):

Parent/Guardian signature :
