



The Urban Assembly
School for Green Careers

9th – 12th Grade CTE Scope & Sequence

Introduction

It is our goal at *The Urban Assembly School for Green Careers* to expose students to the complicated environmental problems our world is facing and prepare them for a variety of professions that are now tackling these problems head-on. Our CTE program is the focal point of this goal. A strong and effective CTE program will give our students a broad introduction to both the important issues and solutions, as well as potential pathways to either deeper study in college or entry into a career.

This will be accomplished in several ways including:

- Hard skills
- Soft skills
- Effective research techniques
- Access to off-site learning experiences
- Professional certifications
- Internships

Program Structure

Ninth graders are required to take an introductory course that will give them the background knowledge needed for further study and exposure to all the academic pathways we currently offer. Upon completion of this course, every student must choose from one of our two pathways – *Horticulture* or *Green Buildings*. They will spend their remaining three years in this chosen pathway, with each year further building upon the knowledge gained in previous years culminating in professional certification opportunities. During their senior year, candidates can qualify to spend a half day at off-site internships. Part of our CTE requirement is to teach career and financial management (CFM). This is accomplished through interactive online software that the students can access at any time.

Ninth Grade Overview

Our ninth graders receive a semester where they are introduced to the basics of the major environmental issues our world needs to address. It is here where they learn what we mean by "green" or "sustainable," where they will gain the language of an environmental scientist, and learn how our problems might be addressed. These environmental issues will be framed to introduce them specifically to our academic pathways of *Horticulture* and *Green Buildings*. During their second semester, students will learn some of the basic practical skills necessary to succeed in their chosen pathway. This will be taught through the lens of simple carpentry and planting projects. Eligible students will have the opportunity to earn their first professional certification in ninth grade. OSHA's 10-hr General Construction certification is nationally recognized and required on NYC job sites.

Skills Acquired:

- Environmental literacy
- Basic hand and power tools
- Basic planting and composting

Potential Projects:

- Compost bins
- Solar-powered charging station

9th GRADE	
Theme: What is "Green"?	
Fall Semester: Intro to Environmental Issues/Careers Unit 1: Fundamentals of Environmental Literacy Unit 2: Water/Energy/Infrastructure Unit 3: Food & Agriculture/Waste/Health	Spring Semester: Intro to the Pathways Unit 4: Blueprint Reading/Construction Math/Measuring/Tool safety Unit 5: Carpentry and Horticulture Project #1 Unit 6: Carpentry and Horticulture Project #2 <u>Credential:</u> <ul style="list-style-type: none"> • OSHA 10-hr General Construction

Green Buildings Pathway: Overview

In response to both the worldwide mission of "greening" our built environment, and New York City's leadership position on green building via GreenNYC and Local Laws 84-88, our *Green Buildings* pathway is structured to introduce and prepare students for a variety of careers and/or additional study after graduation in this exciting industry.

In the tenth grade, students will learn the fundamentals of how buildings stand up and are built. We start with construction basics in the fall semester and end with structural basics in the spring semester. Hands-on building labs are integrated into the curriculum for all major topics. The hands-on lab for construction features a full-scale wood-framed building that students will build in teams. Each phase of construction builds on the previous until a complete wall system is achieved at the end of the semester.

By eleventh grade, the students should have a basic understanding of buildings and are ready for more advanced concepts relating to "green" buildings. The fall semester is dedicated to the GPRO Fundamentals Certification. This course will not only give students a baseline understanding of green buildings, but will also arm them with a nationally recognized credential. The spring semester will put their new green building knowledge into practice. Each team of students will build one of several "high-performance" wall sections that they will analyze and propose improvements to if necessary.

Twelfth graders will delve deeper by exploring buildings' MEP systems and the newest green design techniques for these systems. In the spring semester, students will be expected to synthesize their knowledge from all previous semesters into a building project using the same mock-up building made by the 10th graders in the fall semester. They will analyze the mock-up, designing upgrades, and finally retrofit it to be high-performance and green. By the end of the year, the students will begin to delve into the operations and maintenance of buildings.

Green Buildings Pathway: Careers, Skills, and Credentials

CAREER PATHS	POTENTIAL JOBS	SKILLS ACQUIRED	CREDENTIALS
Design	<ul style="list-style-type: none"> Architect Engineer 	<ul style="list-style-type: none"> Reading blueprints Identifying building system types and components Analyzing existing buildings Specifying alternative materials 	<ul style="list-style-type: none"> OSHA 10-hr Gen. Const. (core) GPRO: FUND (core) BPI BSP (core)
			<ul style="list-style-type: none"> LEED GA (stackable) DOE HES (stackable)
Construction	<ul style="list-style-type: none"> Construction Manager Construction Trades Building Inspector 	<ul style="list-style-type: none"> Rough Carpentry Mechanical roughing Plumbing roughing Electrical roughing 	<ul style="list-style-type: none"> OSHA 10-hr Gen. Const. (core) GPRO: FUND (core) BPI BSP (core)
			<ul style="list-style-type: none"> GPRO: CM or MEP (stackable) NCCER Cons. Tech. (stackable)
Operations & Maintenance	<ul style="list-style-type: none"> Energy Auditor HVAC Technician Facilities Manager Building Super Building Maintenance 	<ul style="list-style-type: none"> Basic construction skills Identifying building system types and components Analyzing existing buildings Retrofitting existing buildings Troubleshooting 	<ul style="list-style-type: none"> OSHA 10-hr Gen. Const. (core) GPRO: FUND (core) BPI BSP (core)
			<ul style="list-style-type: none"> OSHA Gen. Industry (stackable) GPRO: OM (stackable) DOE HES (stackable) EPA Universal Tech. (stackable)

Green Buildings Pathway: Curriculum

10th GRADE Theme: <i>How are Buildings Put Together?</i>	11th GRADE Theme: <i>Why & How do We Build "Green"?</i>	12th GRADE Theme: <i>Can we make old Buildings "Green"?</i>
Fall Semester: Construction Basics Unit 1: Framing (Mock-up house) Unit 2: MEP Unit 3: Sheetrock/Insulation, Finishing	Fall Semester: GPro Fundamentals Unit 1: Fundamentals Part A Unit 2: Fundamentals Part B ₁ Unit 3: Fundamentals Part B ₂ Embedded Full-Semester Unit: CFM1a (Everfi)	Fall Semester: Building Systems Unit 1: HVAC Systems Unit 2: Plumbing Systems Unit 3: Electrical Systems Embedded Full-Semester Unit: CFM2a (Naviance)
Spring Semester: Structural Basics Unit 4: Tension/Compression Unit 5: Beams/Columns Unit 6: Loads/Forces	Spring Semester: Building Science Unit 4: Heat, Air & Moisture Movement Unit 5: Building a High-Performance Wall Unit 6: Analyzing Our Walls Embedded Full-Semester Unit: CFM1b (Everfi)	Spring Semester: Installer Skills Unit 4: Analyzing the Mock-up Unit 5: Retrofitting the Mock-up Unit 6: Operations & Maintenance Embedded Full-Semester Unit: CFM2b (Naviance)

Horticulture Pathway: Overview

The first objective of UAGC's Horticulture pathway is to introduce students to and prepare them for careers in horticulture. The course presents lesson plans, fieldwork, and tests that emphasize interactive and investigative learning and the possibility of professional certifications. The teaching reflects a certain set of standards, set down by the state of New York, and serve as an outline of topics that would be encountered within a growing season.

Horticulture is just one of the many topics covered in the high school curriculum. UAGC seeks to develop relevant linkages among as many of these topic areas as possible. The fieldwork (as well as the in-class lab activity) is integral to understanding of the plant-people relationship, emphasizing concepts while allowing students to experience the physicality of these concepts for themselves. Students are tested on their performance in the field and their ability to recall and explain, in their own words, key concepts, processes, and terms that they have studied. Overall, the resources utilized by the course cover the standards required as baseline knowledge to one seeking entry-level horticulture work or higher education in horticulture and related fields, with particular stress on experiential and service learning.

The second goal is to beautify the extensive green spaces of the campus environment, through collaborative enterprise with all of the schools housed on our campus and to serve as an extension service to the local community by assisting them in installing and caring for community gardens, public space, and green spaces throughout the neighborhood. Service learning is the chosen method to develop the vital skills needed to protect and manage landscapes, maintain healthy trees, design attractive gardens, and produce landscape plants.

Horticulture Pathway: Careers, Skills, and Credentials

CAREER PATHS	POTENTIAL JOBS	SKILLS ACQUIRED	CREDENTIALS
Design & Research	<ul style="list-style-type: none"> Landscape architect Floral designer Botanist Arborist Teacher 	<ul style="list-style-type: none"> Reading blueprints Plant identification Plant selection Soil testing 	<ul style="list-style-type: none"> NOCTI (core)
			<ul style="list-style-type: none"> Just Foods Farm School for Urban Agriculture (stackable) NYBG (stackable)
Construction	<ul style="list-style-type: none"> Green roof installer Gardener Landscaper 	<ul style="list-style-type: none"> Installing and repairing fence Planting and transplanting Hardscape installation Green roof installation Basic carpentry and masonry skills 	<ul style="list-style-type: none"> NOCTI (core)
			<ul style="list-style-type: none"> Eco Brooklyn Green Roof Certification (stackable)
Operations & Maintenance	<ul style="list-style-type: none"> Grounds keeper Integrated pest management Horticulture manager Park ranger 	<ul style="list-style-type: none"> Mowing and string trimming Mulching and composting Understory tree and shrub pruning and maintenance Leaf removal, brush clearance Winter maintenance Weeding Debris and trash removal 	<ul style="list-style-type: none"> NOCTI (core)
			<ul style="list-style-type: none"> Citizen Tree Pruner (stackable) Integrated Pest Management (stackable)

Horticulture Pathway: Curriculum

<p align="center">10th GRADE</p> <p align="center">Theme:</p>	<p align="center">11th GRADE</p> <p align="center">Theme:</p>	<p align="center">12th GRADE</p> <p align="center">Theme:</p>
<p>Fall Semester:</p> <p>Unit 1: Soil</p> <p>Unit 2: Intro to Plant Science</p> <p>Unit 3: Fundamentals of Gardening</p>	<p>Fall Semester:</p> <p>Unit 1: Site Assessment</p> <p>Unit 2: Permaculture Fundamentals</p> <p>Unit 3: Designing with Plants</p> <p>Embedded Full-Semester Unit: CFM1a (Everfi)</p>	<p>Fall Semester:</p> <p>Unit 1: Urban Landscapes</p> <p>Unit 2: Choosing Plants</p> <p>Unit 3: Graphics</p> <p>Embedded Full-Semester Unit: CFM2a (Naviance)</p>
<p>Spring Semester:</p> <p>Unit 4: Plant Propagation</p> <p>Unit 5: Planting the Garden</p> <p>Unit 6: Maintaining the Garden</p>	<p>Spring Semester:</p> <p>Unit 4: Site Materials</p> <p>Unit 5: Principals of Ecological Landscape Design</p> <p>Unit 6: Design Development</p> <p>Embedded Full-Semester Unit: CFM1b (Everfi)</p>	<p>Spring Semester:</p> <p>Unit 4: Survey of Green Technologies</p> <p>Unit 5: Environmental Restoration</p> <p>Unit 6: Career Survey</p> <p>Embedded Full-Semester Unit: CFM2b (Naviance)</p>