

101 Greengineering
 Career and Vocational Technical Education
 Newton Public Schools

COURSE SYLLABUS – 101

Instructor: Stephen Chinosi

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Room: 148

Extra Help: Mondays – 2:25-3:20 and Thursdays – 2:40-3:20 Term: One Semester

A mission of the vocational technical programs is to provide students with a learning environment that actively engages them in the pursuit of developing and honing industry recognized competencies in their chosen field of study.

Course Description: Greengineering 101 is driven by the question “How do we design a sustainable existence?” or “How much fun can we have saving the species?” In this course students will take greater responsibility for their learning and for their place on the planet. Students are expected to think more expansively and to engineer solutions to local and global issues regarding the environment, the economy, and the people that connect the two.

Greengineering 101 Year-at-a-glance

<u>TERMS</u>	<u>TOPICS</u>	<u>GOALS</u>
<u>ONE</u>	<ul style="list-style-type: none"> -Intro to GNRG Bootcamp -Safety -Engineering/Design Process (EDP) -Team work 	<ul style="list-style-type: none"> -Design Thinking Protocols -Lab/Shop Safety Rapid Cycle and Deep Dive Design Challenges Intro to Core4
<u>TWO</u>	<ul style="list-style-type: none"> -Core 4 Research Teams -Science of Sustainability 	<ul style="list-style-type: none"> BioDiesel Aquaponics Algae Material Re-engineering
<u>THREE</u>	<ul style="list-style-type: none"> Team Teach Teams Switch 	<ul style="list-style-type: none"> Multi-day immersion lessons and activities
<u>FOUR</u>	<ul style="list-style-type: none"> - SCiNQ Scientific Inquiry (solo) -Design Challenge (teams) 	<ul style="list-style-type: none"> -Create paper/presentation on a question that will advance greengineering research -Design greengineered Solution for a local or global

		<u>problem</u>
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There is an online component to this class. Students are required to spend time posting to the discussion board on the class website (<http://www.greengineers.wikispaces.com>). Students will also find critical information for class posted there as well. Students are expected to visit the website daily.

Course Objectives: By the end of the Greengineering 101, the students will be able to:

- Utilize the Engineering and Design Process (EDP) across multiple and novel problem sets.
- Construct basic lab systems for algae photoreactor applications
- Build Biodiesel reaction systems
- Build and Understand the mechanics of aquaponic systems
- Understand the basic economics and policy of alternative energy/agriculture markets
- Design and Develop marketable products from waste-stream sources
- Understand the basic chemistry of petroleum-based and bio-based plastics
- Investigate the advanced chemistry of bio-based fuels

Grading Policy:

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- 0 = No evidence of learning
- 1 = Can do most of the simple stuff with help
- 2 = Can do all of the simple stuff
- 3 = Can do all of the simple stuff and all of the complex stuff
- 4 = Can go beyond what was directly taught in class

Attendance:

- This course is designed as a hands-on workshop; as a result, students are expected to attend and participate in all classes. Any absence will negatively affect your grade. Students should contact instructor as soon as possible with any attendance issues.

Grading Dissemination:

- 30% = Daily participation
- 10% = monthly “Stand and Delivers” present class related articles and videos
- 10% = monthly “State of the Shop” blog (posted twice a month online - discussion board)
- 10% = Weekly 3-2-1 (posted online - discussion board)
- 10% = Monthly Team Reports (terms 2 and 3)
- 10% = Team Teaching Lessons and Activities (term 3)
- 20% = Scientific Inquiry Projects and Design Challenge (term 4)

Late Work Policy:

- Students must contact instructor as early as possible (via email or voicemail) if course work will be late.
Late work must be turned in at the next class meeting.

Extra Credit Policy:

- N/A