EAST LAKE HIGH SCHOOL

Class of 2029

Discovery Night

Class Options

- AP Courses in Every Subject, plus AP electives
- AICE Marine Science, AICE General Paper
- Academy of Biomedical Sciences
- Academy of Business Careers
- Academy of Engineering
- Academy of Visual & Performing Arts
- Foreign Languages: Spanish & French
- AVID Program

#TogetherWeSOAR

EAST LAKE HIGH SCHOOL

Eagle Works 9th Grade Potential Schedule

Subject	Course
English	English II Hon
Social Studies	AP Human Geography or Additional Elective
Mathematics	Geometry Hon, Algebra II Hon
Science	Biology I Hon
Engineering	Applied Engineering Technology I*
Robotics	Foundations of Robotics I Hon* Option 1
Game and Simulation	Game and Simulation Foundations* Option 2
* Required courses for all students in the Academy	

Clubs & Activities

- National Honor Societies
- Student Government
- Future Business Leaders of America
- Health Opportunities for Students of America
- Debate Club
- Model UN
- Special Interest Clubs including: Guitar Club, Chess Club, French Club, etc.
- SAVE / SADD / SWAT - Safe Decision Clubs

EAST LAKE HIGH SCHOOL

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Athletic Teams

- JV and Varsity Sports
- Fall, Winter, and Spring Seasons
- Forms and info on school website
- Many student athletes excel in athletics and other pursuits

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EAST LAKE HIGH SCHOOL

The Eagle Works Academy of Engineering

EAST LAKE

EAGLE WORKS ROBOTICS

EAST LAKE

ENGINEERING ACADEMY

EAST LAKE

EAST LAKE

ENGINEERING ACADEMY

Instructors:

- Anthony Arestia
- Malaykumar Bhatt
- Chris Carney
- Ryan Green
- Daniel Mills

Administration:

- Daniel Schmittdiel, Principal
- Shawn Anderson, AP

Eagle Works Courses

Grades	Engineering	Robotics	Game & Simulation
9th	Applied Engineering Technology I	Foundations of Robotics	Game and Simulation Foundation
10th	Applied Engineering Technology II	A.I. in the world & Applications of A.I.	Game and Simulation Design
11th	Applied Engineering Technology III	Procedural Programming	Game and Simulation Programming
12th	Advance Technology Application (ATA)	ATA	ATA

Engineering Industry Certifications

- Autodesk Fusion 360 (9th)
- REC Pre-Engineering (10/11th)
- REC Robotics (10/11th)
- Autodesk Inventor (12th)

AI / Robotics Industry Certifications

REC Robotics

Drone Certification

Python Certification

Game & Sim Industry Certifications

- Photoshop & Illustrator
- Unity Certified User Programmer
- Unity Certified User Artist
- Unity VR

Eagle Works Course Descriptions

APPLIED ENGINEERING TECHNOLOGY I

Freshman Level Course

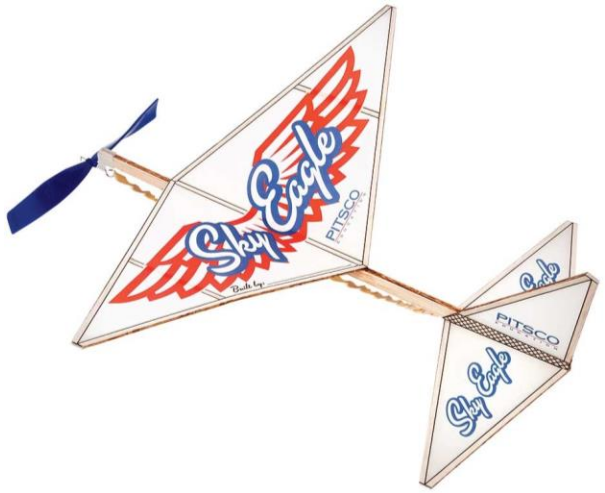
Mr. Mills

EAST LAKE

ENGINEERING ACADEMY

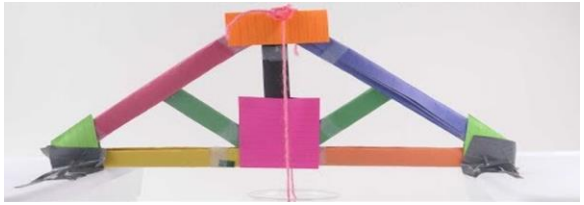
CLASSROOM PROJECT EXAMPLES

Gliders



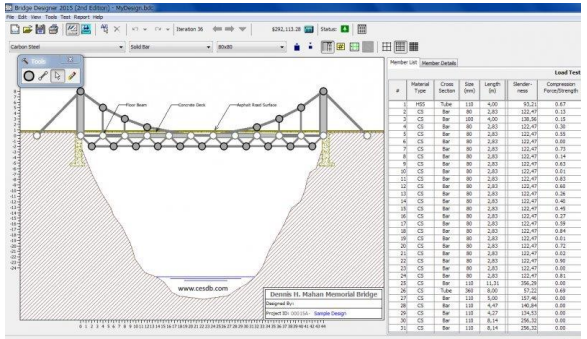
Space Shelter Challenge

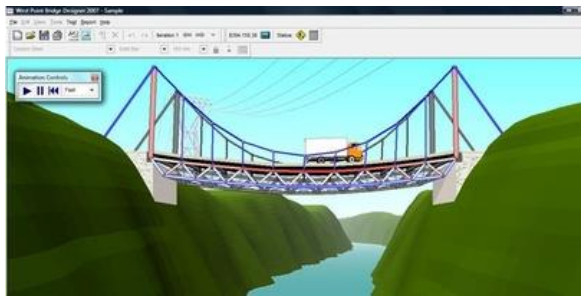
Paper Truss Weight Challenge



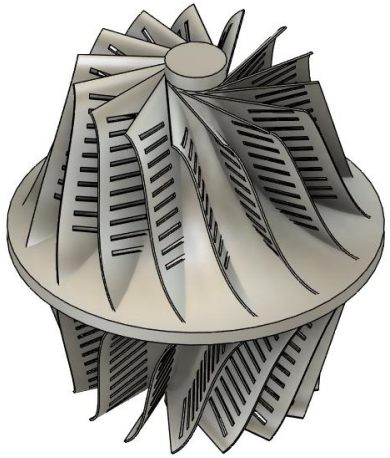
DIY Radio Kits

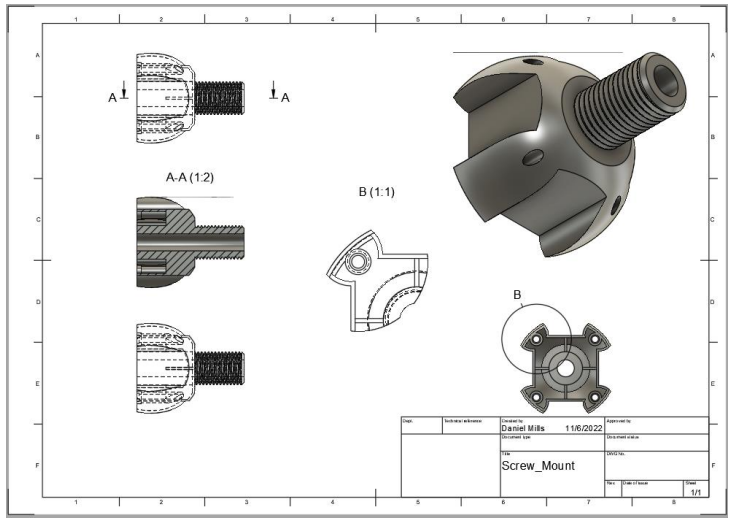
Bridge Designer

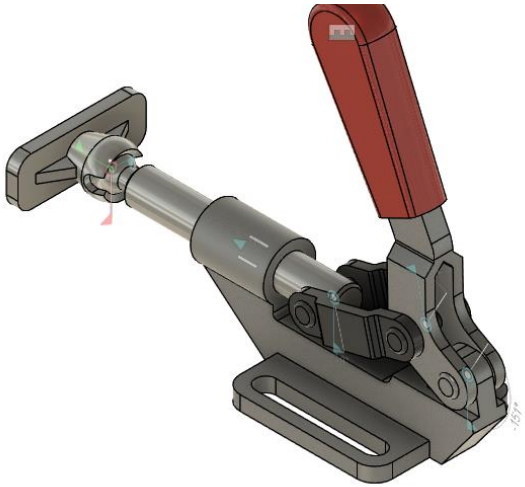


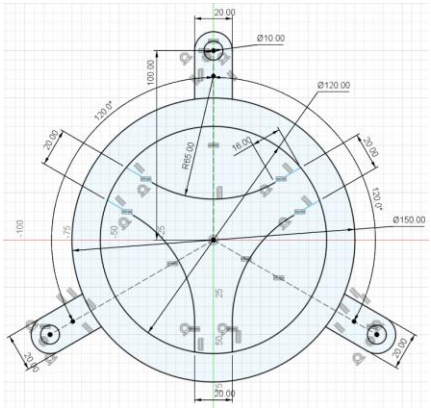


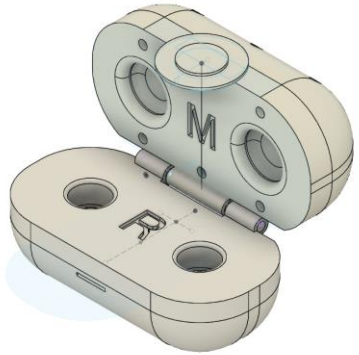
C.A.D. EXAMPLES











APPLIED ENGINEERING TECHNOLOGY II

Sophomore Level Course

Mr. Arestia

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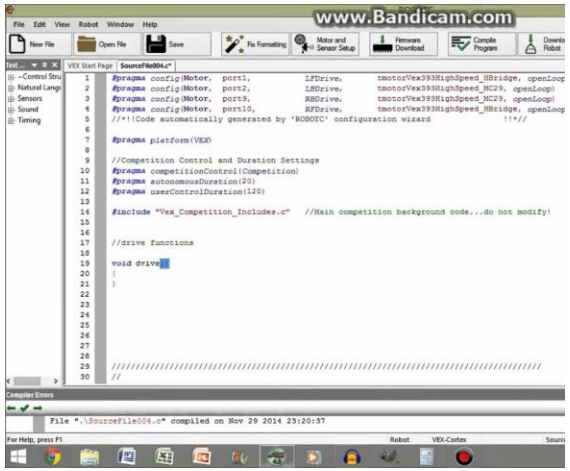
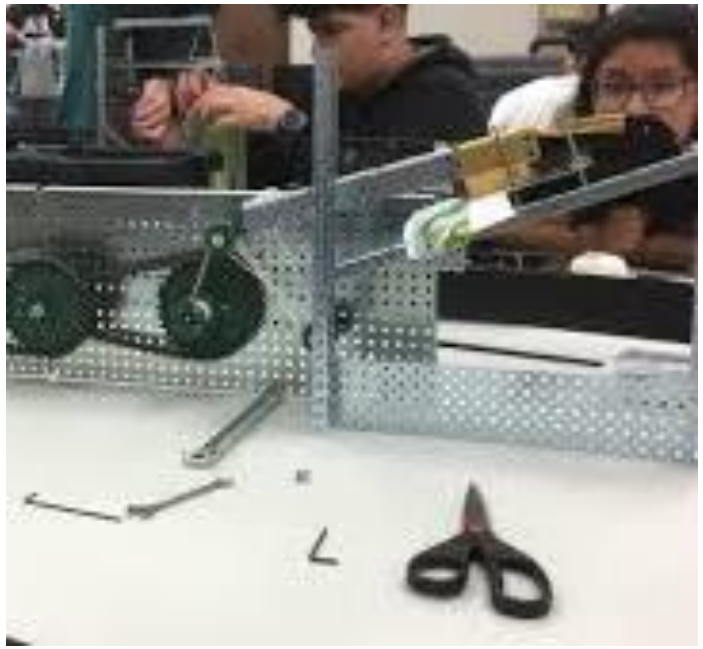
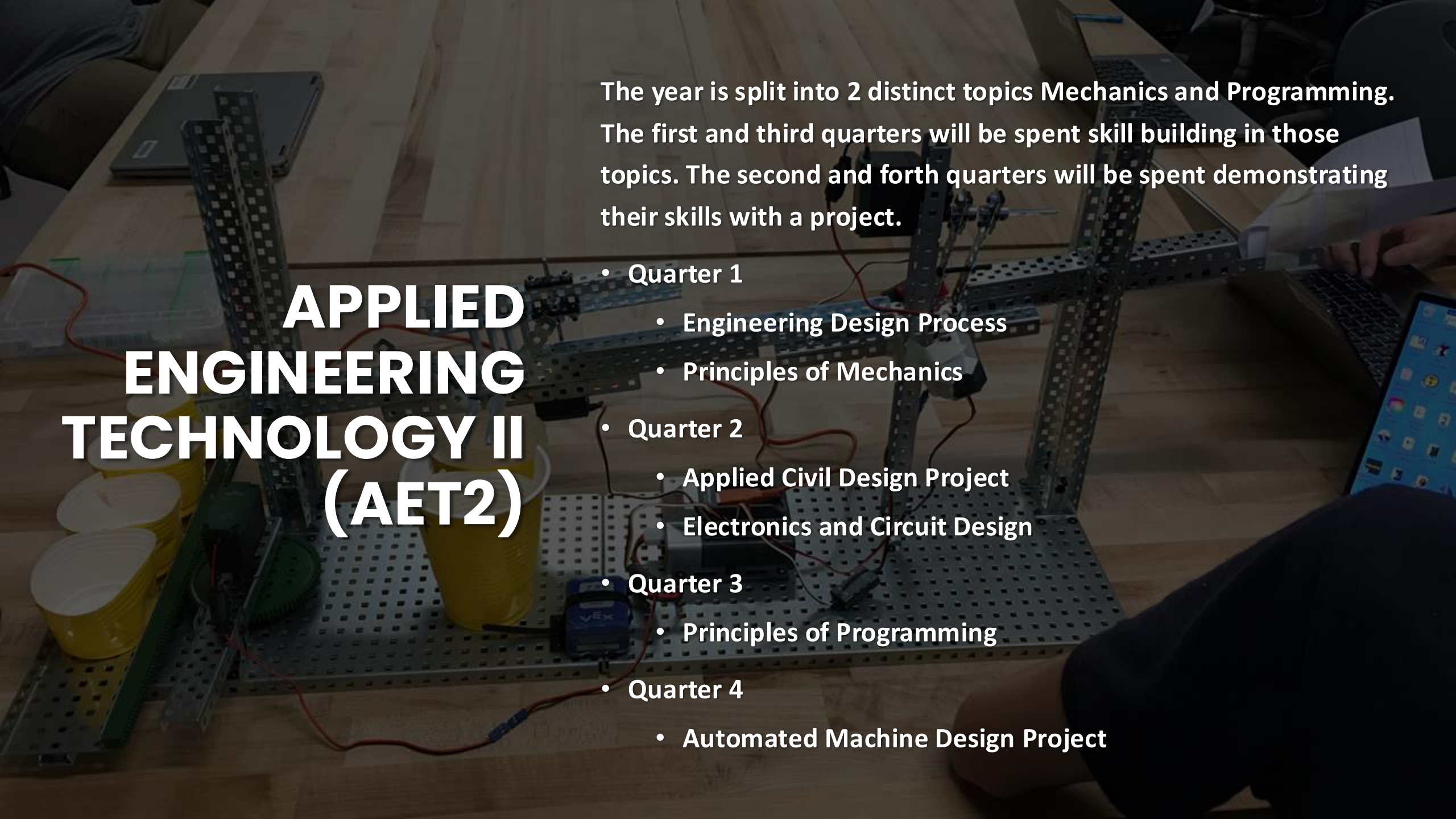
ENGINEERING ACADEMY





APPLIED ENGINEERING TECHNOLOGY II (AET2)

- Course is designed to expose students to the engineering design process and how to effectively communicate their design ideas.
- Course Topics will focus on machine function, design, and automation.
- Student will take REC certification exams on Mechanics and Programming at the end of each semester. Qualifying scores on both will earn them the REC Pre-Engineering Certification.



APPLIED ENGINEERING TECHNOLOGY II (AET2)

The year is split into 2 distinct topics Mechanics and Programming. The first and third quarters will be spent skill building in those topics. The second and forth quarters will be spent demonstrating their skills with a project.

- Quarter 1
  - Engineering Design Process
  - Principles of Mechanics
- Quarter 2
  - Applied Civil Design Project
  - Electronics and Circuit Design
- Quarter 3
  - Principles of Programming
- Quarter 4
  - Automated Machine Design Project

EAST LAKE

ENGINEERING ACADEMY

APPLIED ENGINEERING TECHNOLOGY III

Mr. Bhatt

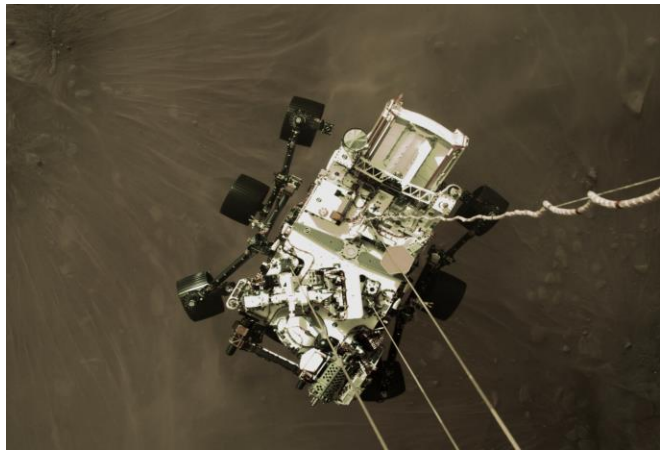
Sponsor of Eagle Works

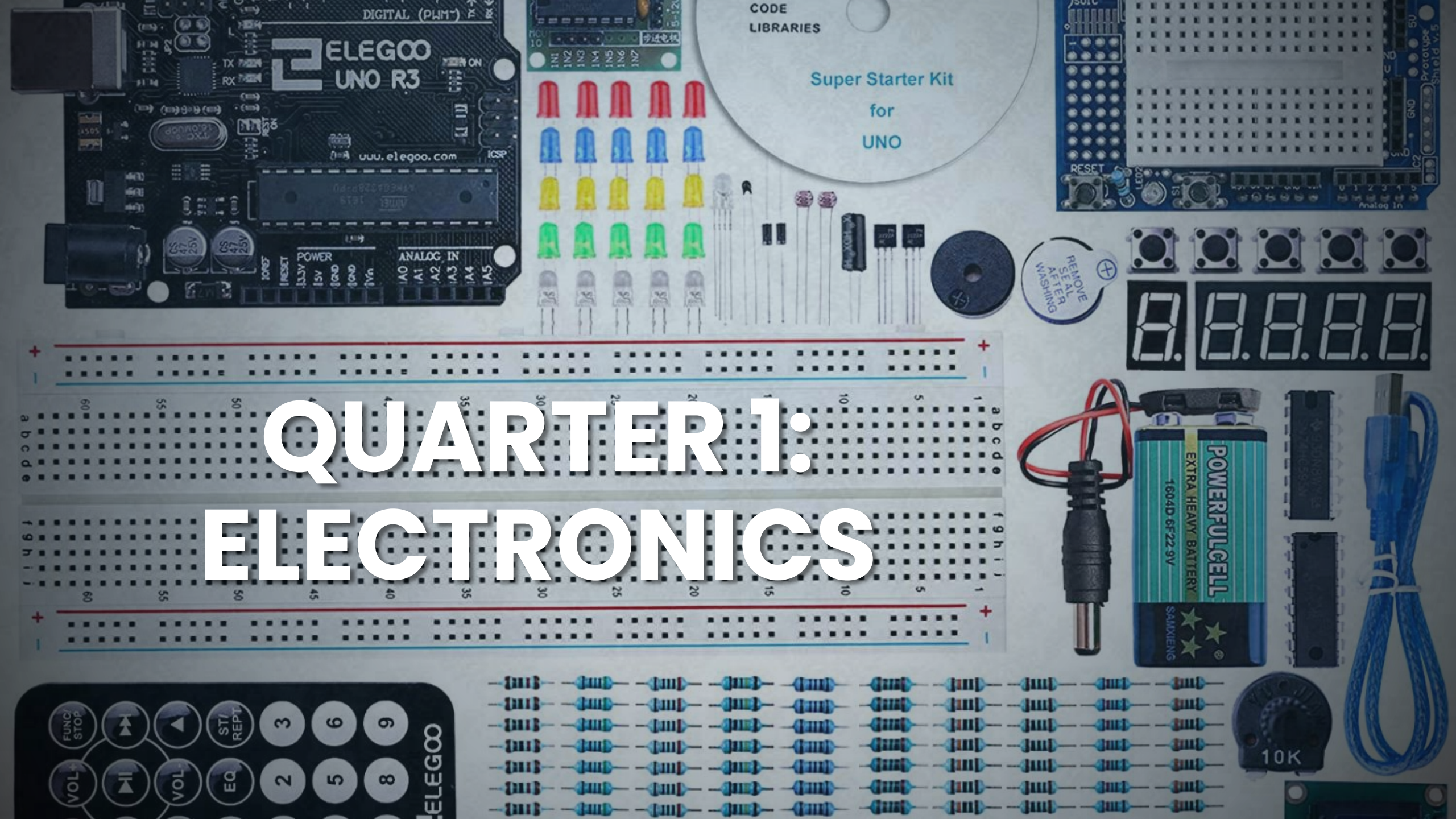
- AI Club
- Drones Club
- Harvard/MIT Club

MISSION TO MARS

Space, the final frontier.
This is a year-long mission to explore a new world, new resources, and to boldly go where no Juniors have gone before!

- **Build your own Mars team**
- **Design your own mission on Mars**
- **Explore electronics, robots, drones, and rockets**
- **Build your own projects**
- **Learn fundamentals of flight and orbital mechanics**
- **Calculate flight path to Mars**
- **Launch rocket and mimic Mars landing**





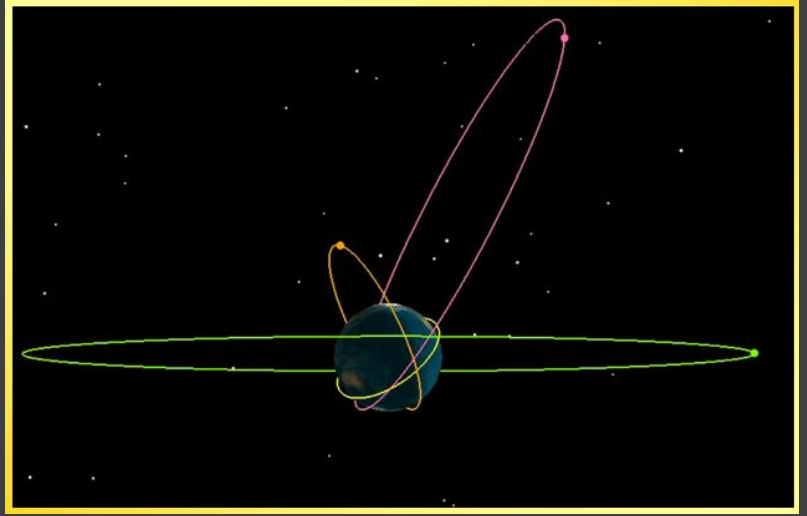
QUARTER 1: ELECTRONICS

QUARTER 2: MARS ROVERS AND ROBOTS

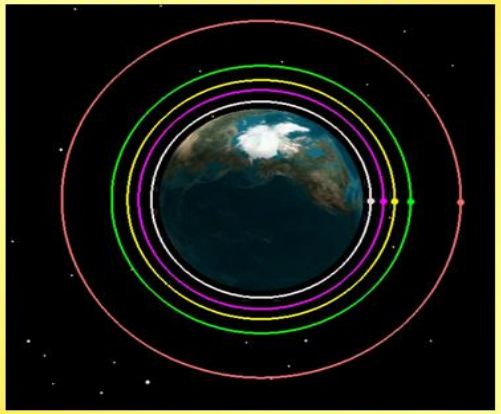
QUARTER 3: MARS DRONES

QUARTER 4: ORBITAL MECHANICS

Diverse Orbits



Let's Have a Race



$$T = 2\pi \times \frac{a^{\frac{3}{2}}}{\sqrt{\mu}} = 2\pi \times \frac{a^{\frac{3}{2}}}{\sqrt{GM}}$$

Total Energy of an Orbit

Combine the potential and kinetic energies.

$$E = U + K$$

$$E = \frac{-GMm}{R} + \frac{1}{2}mv^2$$

$$E = \frac{-GMm}{2R}$$

Where'd that come from?!

In circular orbits, the force of gravity between a planet and the Sun is:

$$F = \frac{GMm}{R^2}$$

Potential Energy = Force × Elevation

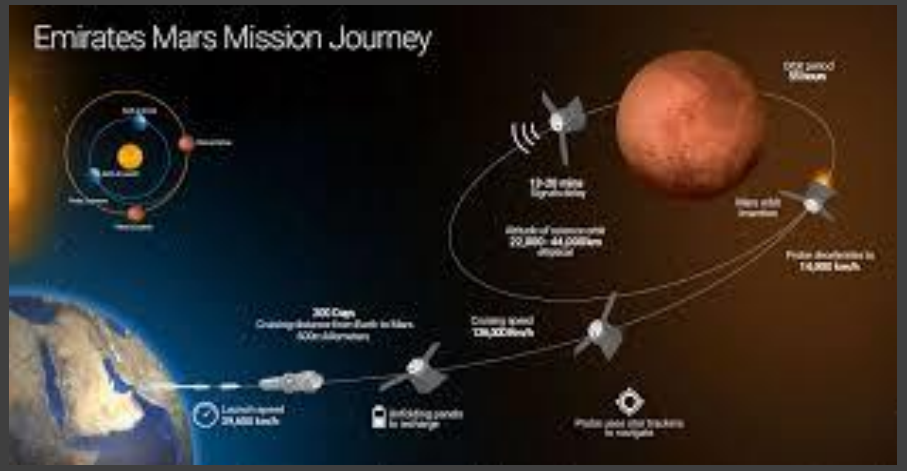
Gravity Force = Centripetal Force

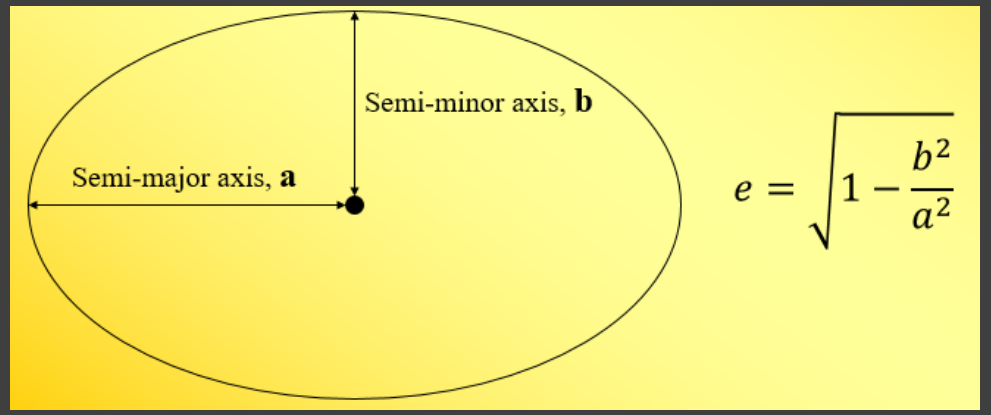
$$\frac{GMm}{R^2} = \frac{mv^2}{R} \quad \Rightarrow \quad mv^2 = \frac{GMm}{R}$$

$$E = \frac{-GMm}{R} + \frac{1}{2}mv^2 = \frac{-GMm}{R} + \frac{1}{2}\left(\frac{GMm}{R}\right) =$$

$$(-1)\frac{GMm}{R} + \left(\frac{1}{2}\right)\frac{GMm}{R} = \left(-1 + \frac{1}{2}\right)\frac{GMm}{R} = \frac{-GMm}{2R}$$

Emirates Mars Mission Journey





$$e = \sqrt{1 - \frac{b^2}{a^2}}$$

QUARTER 4: ROCKETS

AI – ARTIFICIAL INTELLIGENCE

Mr. Bhatt

Sponsor of Eagle Works

- AI Club
- Drones Club
- Harvard/MIT Club

ARTIFICIAL INTELLIGENCE

- Linux OS for Robotics
- **Python** Coding for **Robotics**
- Artificial Intelligence for Robotics
- Nvidia Jetson Nano
- Fundamentals of Self-Driving Car

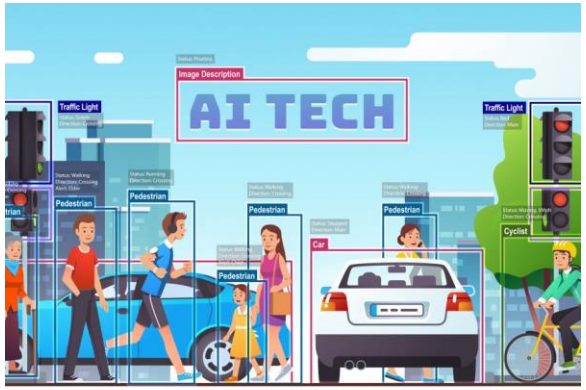
AUTONOMOUS CARS

AI Tools and Technologies	AI Robotics Projects	AI Model Autonomous Car	Training the Model Car
Testing the Model Car	Autonomous Car Tournament	AI JetRacer vs. JetBot Race	Robotics Certification

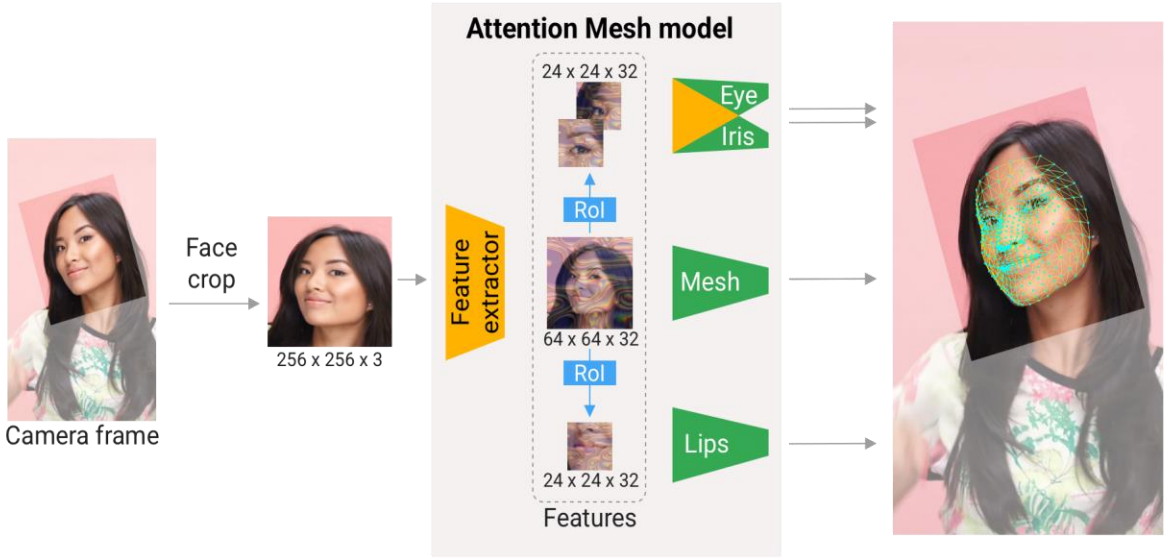
AUTONOMOUS DRONES

Drone Safety	Drone Certification	Autonomous Drones	Applications of Autonomous Drones
Training the AI Drone Mission	**Testing the** AI Drone Mission	AI Drone Race	AI Drone 'Dog Fight'

AI AND DRONE CLUBS

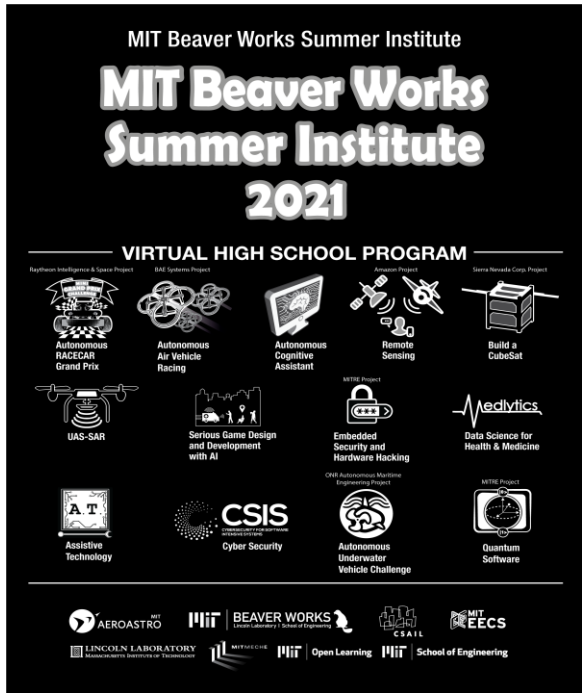


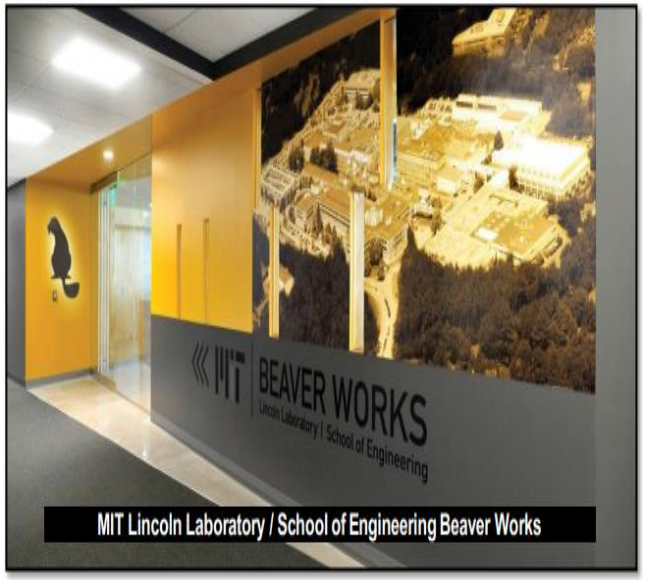
- Object Detection and Recognition
- Speech Analysis and Synthesis
- Autonomous Applications
- Civilian, Military and Space Applications
- AI Challenges
- Applied AI Projects



HARVARD/MIT CLUB

- Harvard Student Academies Program
- Harvard Summer Programs
- MIT Fall, Spring, and Summer Programs





ADVANCED TECHNOLOGY APPLICATIONS

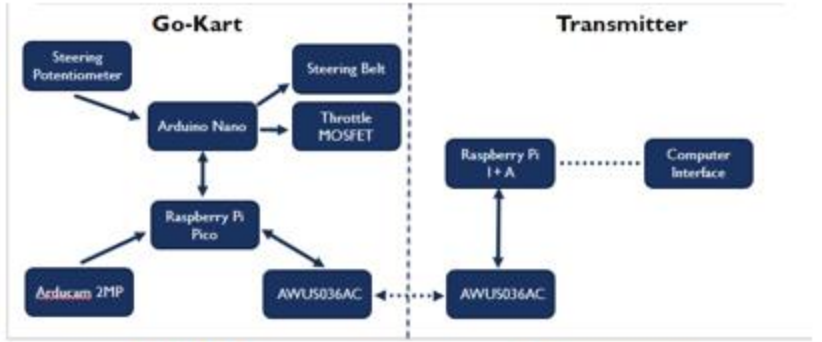
Senior Capstone Course

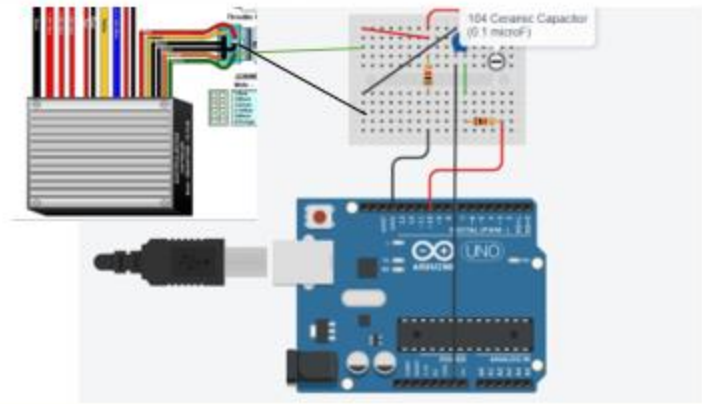
Mr. Ryan Green

Engineering Honor Society Sponsor

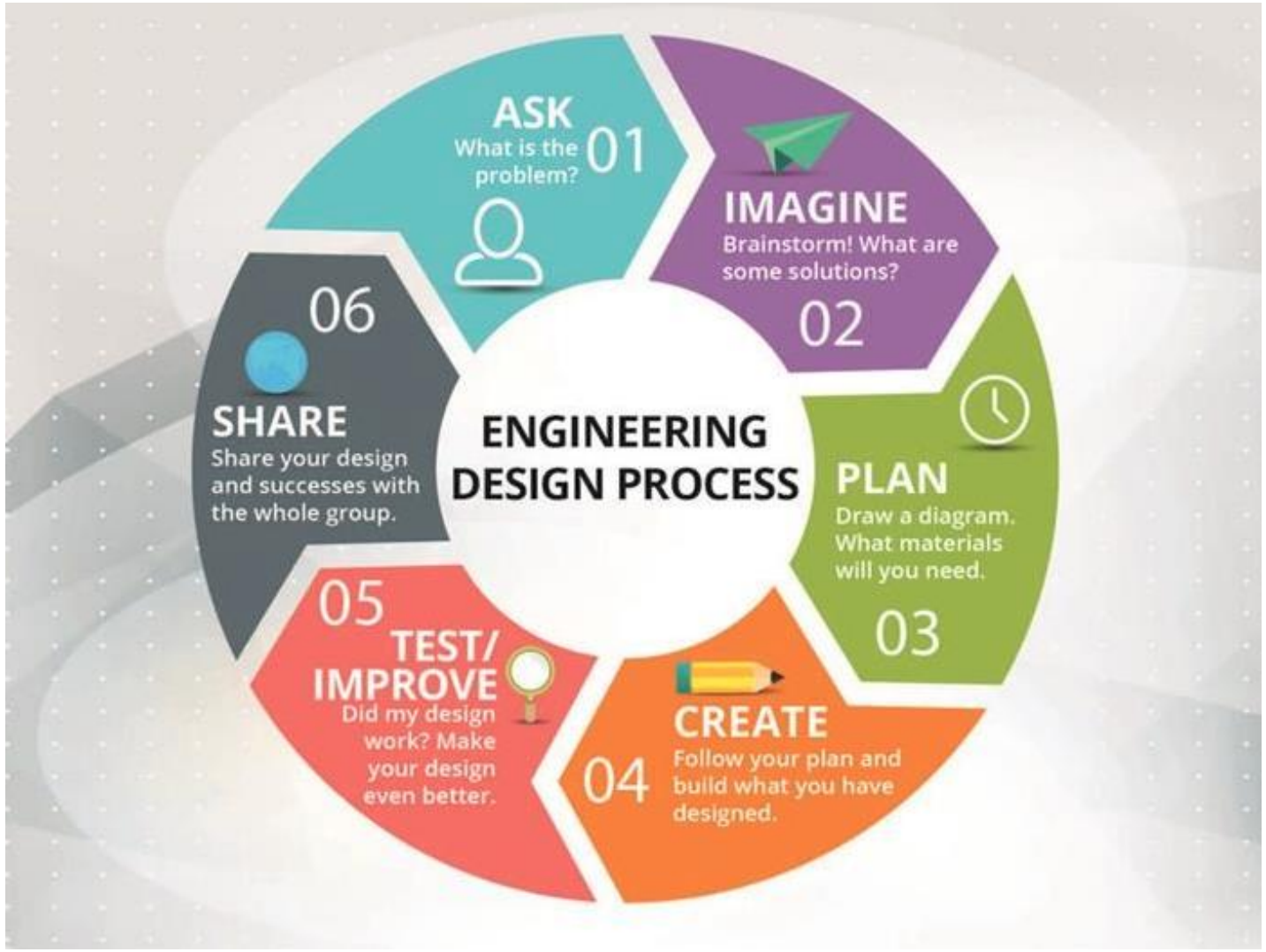
ADVANCED TECHNOLOGY APPLICATIONS

- In Advanced Technology Applications (ATA) students will identify a real-world challenge and then research, design, and test a solution, ultimately presenting their unique solutions
- Students learn modern engineering processes and techniques to construct a working prototype to solve the problems they've identified

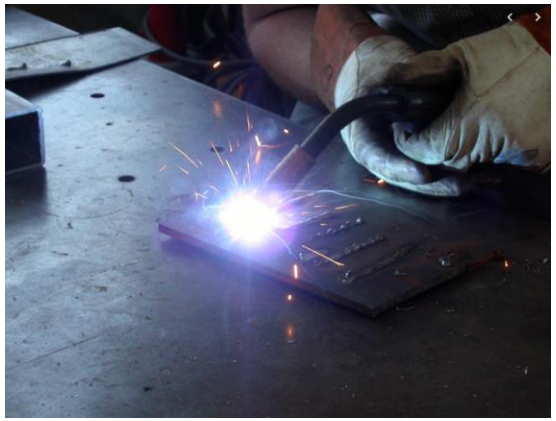




EXPANDED DESIGN PROCESS



PROTOTYPE CONSTRUCTION



TESTING AND DATA COLLECTION

PRESENTATION OF FINAL DESIGN AND TEST RESULTS

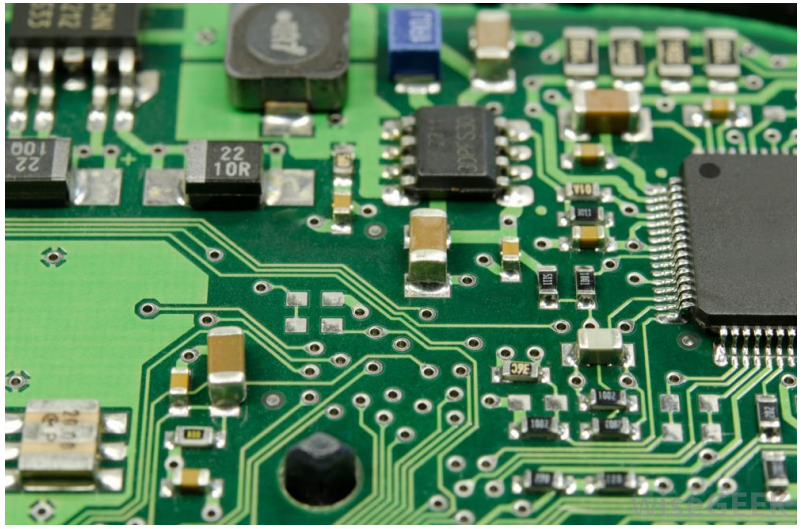
FOUNDATIONS OF ROBOTICS

Mr. Ryan Green

Sponsor of Eagle Works Robotics

Co-sponsor of EHS

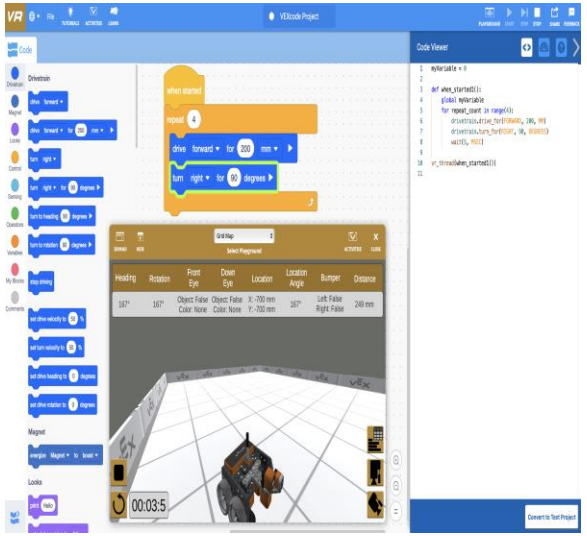
ROBOTICS

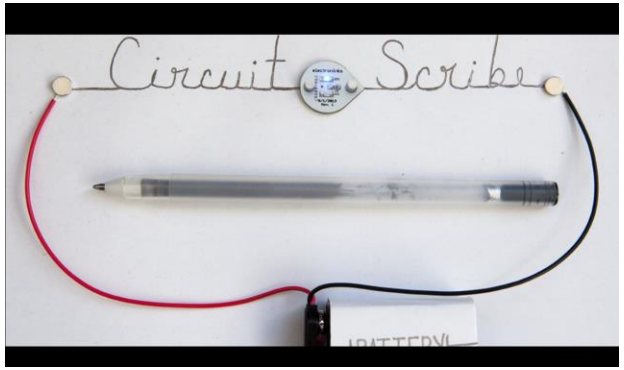


- Physics / Mechanics of Robotics
- Principles of Electronics for Robotics
- Programming for Robotics
- Python

PLATFORMS

- Visual Studio Code
- MicroBit
- Python Projects
- Circuit Scribe





GAME AND SIMULATION FOUNDATIONS

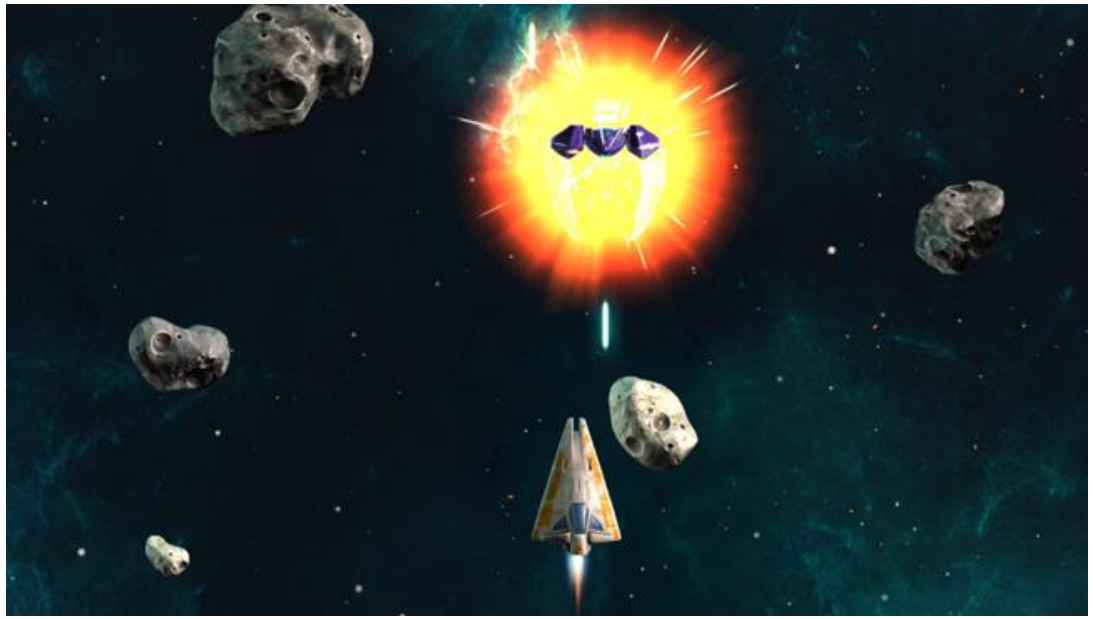
Mr. Carney

Mr. Mills

Sponsors of Eagle Works E-Sports

UNITY

- 3D Games
- 2D Games
- C#
- Game Development



VIRTUAL GAMES AND SIMULATIONS

As this course grows, students will be able to...

- Create virtual reality simulations
- Create and present a business plan to market their game/project
- Work within our community with local business to develop programs for real world training.

DISTRICT APPLICATION PERIOD

- **Application Window:**
  - **January 7-17, 2025**
- **Shadow Appointments schedule on our website> Programs> Engineering> Shadow Appts**
- **Visit our website to find out more**

www.pcsb.org/domain/2093

THANK YOU FOR COMING TONIGHT!

- To receive updates on the Eagle Works Academy of Engineering Application Process, click the QR Code