

# Holy Trinity High School

## STEM II

Course Title: STEM II

Length of course: one year

Goal: The second course offering in the study of STEM continues to build on the skills needed in the areas of Science, Technology, Engineering, and Math.

Objectives:

1. Through experimentation and observation, critical thinking, communication, and collaboration skills will be further developed.
2. A project –based instructional approach will produce self-directed learners equipped to excel in the 21<sup>st</sup> century.
3. Students will use critical thinking , communication , and collaboration skills to compete in various science and math competitions.
4. Students will meet with professionals in the field and be introduced to new careers in STEM.
5. Students will further their programming skills in MIT App Inventor, JavaScript, HTML and CSS, as well as learn Python and Robot C.
6. Students will learn how to conduct a scientific literature review.
7. Students will learn how to write a Science Research Paper.

Course Content:

1. Design Challenge
2. Robotics Unit
  - a. Assemble Robots
  - b. Complete tasks using Controller
  - c. Programming project using Robot C
3. Program Apps Unit
  - a. Using MIT App Inventor software, program an App for the cell phone to enter the Congressional App Challenge.
  - b. Create a 2-3 minute video that includes explaining the purpose of your App, how it was created and a demonstration of how the App works.

4. Northwell Health Spark Challenge Competition
  - a. Visit a department of Northwell Health in the fall.
  - b. Create an advertisement over several months promoting a specific career to enter into the Northwell Health competition.
  - c. Design a presentation over several months to be judged on the day of the Northwell Health Spark Challenge.
5. Python Unit
  - a. Learn how to code in Python
  - b. Programming project
6. 3D Printing Unit
  - a. Use Tinkercad software to design objects to help other human beings
7. Cardboard Chair Design Challenge
8. Science Research paper and Science Fair Project
  - a. Initiate the Research process -Brainstorming
  - b. Develop a Question
  - c. Conduct a Literature Review/Background Research
  - d. Methodology and Procedures
  - e. Collect Data
  - f. Draw Conclusions Based on Data
  - g. Recommendations for Further Research
  - h. Write Abstract
  - i. Create Works Cited
9. Design presentation based on Science Research Paper for Holy Trinity Science and Technology Fair

#### Field Trips

- a. STEM Career Expo
- b. Northwell Health Dept
- c. StonyBrook University STEM Institute
- d. Adelphi Women in STEM
- e. Nassau Community Y2M
- f. Cold Spring Harbor DNA Lab
- g. Brookhaven National Lab

#### Guest Speakers

- h. Alumni STEM professionals
- i. Skype A Scientist

## Competitions

- a. Northwell Health Spark Challenge
- b. Congressional App Challenge
- c. Holy Trinity Science and Technology Fair
- d. Molloy College Science Fair