

COURSE SYLLABUS

Outline: Computer Science (STEM)

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Course Description. The **STEM** acronym stands for science, technology, engineering, and mathematics. All of these academic disciplines rely heavily on each other, and are highly integrated in the professional and academic world. This course will enforce student to exercise thought process and Critical thinking. Student will learn Logarithms, Learn basic coding, develop games and programming robots. The study of computer programming language in use code, debug, compile, and usage will be incorporated in programming skills and lab hours.

This course is intended to integrate the STEM fields through project based learning. Students will be engaged by frequent hands-on activities geared towards combing each of the STEM disciplines. Creativity and collaboration will be encouraged as students solve problems. The class is divided into four main units: concept, hands on, lab and project. Each unit will have an instructional component, formal laboratory component, and project component. During the project phase, students will be presented with a challenge. During this phase they must draw upon their knowledge of the scientific method and STEM disciplines, collaborate with peers, and apply their own creative process to find solutions to the problem.

1. Human Computer Interaction:

Students are introduced to the major components of the computer, including: input, output, memory, storage, processing, software, and the operating system. Fundamental notions of Human Computer Interaction (HCI) and ergonomics are introduced.

2. Problem Solving:

This unit covers the basic steps in algorithmic problem-solving, including the problem statement and exploration, examination of sample instances, design, program coding, testing, and verification.

3. Programming:

Students are introduced to some basic issues associated with program design and development. Students design algorithms and programming solutions to a variety of computational problems, using Scratch and Unity engine to develop game. Programming problems should include control structures, functions, parameters, objects and classes, structured programming and event-driven programming techniques.

4. Computing and Data Analysis:

In this unit students explore how computing has facilitated new methods of managing and interpreting data. Students will use computers to translate, process and visualize data in order to find patterns and test hypotheses.

5. Robotics:

Students apply previously learned topics to the study of robotics and work in small groups to build and program a robot to perform a required task.

The complete curriculum, made available through the National Science Foundation.

Course Objectives:The student will demonstrate the ability to:

- Basic Concept of Computer and History of Internet.
- Thought process, Critical thinking and Critical Analysis.
- Code
- Project
- Develop Game or Robot
- Basic concept of Machine Language
- Learn Programming Language: C++, C#, Javascript or Python

Course Materials: These materials are required in class everyday. Coming to class prepared is a part of your participation in project or group-project.

- Computer
- Scratch
- Unity
- Photoshop or Graphic Designing Tool
- Microsoft Visual Studio
- Drone
- Robot
- Hardware
- Firmware

Equipment Requirement:

Students will require connections to the internet and access to a computing device. For example, students can develop the projects using free open-source platforms on Chromebooks.

Grading Policy:

Grading Scale:

A = 90 - 100

B = 80 - 89

C = 70- 79

D = 60-69

F = 68 or below

Teacher's expectations:

1. Show respect to your teacher and schoolmates.
2. Follow the classroom rules and procedures.
3. Be prepared to learn daily assignment.
4. Participate in activities as directed.
5. Perfect attendance

By participated these five above items, can earn an automatic **D** in grade.