

# **Foundations of Computer Science**

Mr. Bodzer

Bodzer.lawrence@ccpsstaff.org

*Foundations of Computer Science* is an exciting opportunity for all students to learn problem-solving skills and computational thinking. It is designed to introduce students to the field of computer science through an exploration of engaging and accessible topics. Rather than focusing the entire course on learning particular software tools or programming languages, the course is designed to focus on the conceptual ideas of computing.

As part of this course, students will delve into real world computing problems that are culturally relevant and address social and ethical issues while delivering foundational computer science knowledge to students.

## **Major units of study**

Human computer interaction (4 weeks)

- Computers and the Internet
- Models of intelligent behavior
- Societal impacts of computing

Problem Solving (4 weeks)

- Algorithms and abstraction
- Connections between mathematics and computer science
- Societal impacts of computing

Web Design (5 weeks)

- Web page design and development
- Computers and the Internet
- Algorithms and abstraction
- Societal impacts of computing

Introduction to programming (5 weeks)

- Programming
- Algorithms and abstraction
- Connections between mathematics and computer science
- Societal impacts of computing

Computing and data analysis (5 weeks)

- Data and information
- Algorithms and abstraction
- Connections between mathematics and computer science
- Societal impacts of computing
- Programming

## Robotics

- Robots
- Algorithms and abstraction
- Connections between mathematics and computer science
- Societal impacts of computing
- Programming

## Additional topics

\*All times are approximate

**Please Note:** Although using technology is a core component of this course, using computers is not necessarily embedded in the curriculum on a daily basis.

**Class Requirements:** All students are expected to bring a 1 subject composition notebook to class. This notebook will remain in the classroom unless specifically assigned as homework. Students should expect to be writing brief entries daily.

Students will also need a valid email address that they can access at school.

Please be sure to have writing instruments (pens and/or pencils) for class everyday to keep your notes and maintain a journal. If you intend to work on your projects outside of school, you will also need a flash drive to transport digital files back and forth.

## **Corporate Classroom Behavior:**

In this Career and Technical Education (CTE) course, the classroom culture will be that of a professional workplace, and students will be treated as responsible employees working together to produce quality products – their assignments and projects. Students will be taught business practices and given leadership roles in running the class; this will demonstrate the higher level of expectations and distributed management of a real workplace. Collaboration, innovation, and critical thinking as well as safe technology practices will be stressed to ensure students are developing solid 21st Century skills. Detailed classroom standards, procedures and rules will be established together, discussed and clearly posted.

**Grading:** Students will be graded in the following areas.

### **1. Daily Class Work:**

All activities are designed to encourage students to work in a variety of collaborative settings including partnering, peer-programming, and group research teams. This collaboration encourages conversations around computing topics and develops 21<sup>st</sup> century skills.

Most periods will begin with a “warm up” that is designed to get students thinking about computer science; these will be a variety of activities including introductory questions for a new subject, reflections on recent assignments, brain-teaser puzzles, thoughts about technology in the recent news, or an exercise highlighting a tricky area of the previous day’s lesson. Students will start working individually on the “warm up” as they enter the class, then after the bell and taking attendance, the class will discuss the warm up, sometimes collecting students’ responses for closer examination.

Our Corporate Classroom culture requires students to be respectful of others at all times, contribute in discussions, help each other collaboratively, attend class, and take on occasional leadership roles. A standard set of points may be given weekly reflecting student’s participation in warm ups and adherence to the Corporate Classroom expectations. Bonus points will be given for outstanding examples supporting our classroom culture.

## **2. Journal Entries**

Students will be required to reflect in writing on their daily learning. These journals will be checked periodically and graded.

## **3. Projects**

You will have several projects to complete during the semester, including a detailed final project. Each project’s description, due date, and grading rubric will be presented and discussed in class. It will be up to you to budget your time – I will give you opportunities to work in class but some may require outside work as well. I am available most days after school by appointment and during RAMS.

## **4. Exams**

You will have pencil and paper exams during each unit; the daily class work and projects will well prepare you for these exams. They will include reasoning about computational problems, remembering some terminology as well as short essay questions on topics covered. The final exam will be comprehensive.

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I, \_\_\_\_\_, understand my responsibility as a student in a Corporate Classroom. I am willing to work collaboratively with my peers to produce quality work.

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(Student Signature)

I, \_\_\_\_\_, understand my student's responsibility and the expectations for success in the Foundations of Computer Science course.

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(Parent/Guardian Signature)

Is there anything I should know about your student in order to help them be successful in the Computer Science classroom?

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