# Advanced
# Computer Science Discoveries
## 2022-2023
## 8th Grade
## Course Syllabus

## Contact Information


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**Classroom Location:** Portable 7

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## Course Description:

**COMPUTER SCIENCE DISCOVERIES**

*Mapped to CTSA standards, the advanced Computer Science Discoveries course dives deeper into computer science by covering topics such as problem solving, programming, physical computing, user centered design, and Artificial Intelligence/Machine Learning, while inspiring students as they build their own websites, apps, animations, games, and physical computing systems.*

*Additionally, we will be using Google's CS First curriculum as well as participating in Amazon CoderZ's virtual robotics program Cal State East Bay's MESA program.*

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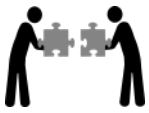
|  | **Problem Solving and Computing**<br>The Problem Solving and Computing unit is an interactive and collaborative introduction to the field of computer science, framed within problem solving. Through a series of puzzles, challenges, and real world scenarios, students are introduced to a problem solving process that they will return to repeatedly throughout the course. Students then learn how computers input, output, store, and process information to help humans solve problems within the context of apps. The unit concludes with students designing an app that helps solve a problem of their choosing. |
|  | **The Design Process**<br>The Design Process unit transitions students from thinking about computer science as a tool to solve their own problems towards considering the broader social impacts of computing. Through a series of design challenges, students are asked to consider and understand the needs of others while developing a solution to a problem. The second half of the unit consists of an iterative team project, during which students have the opportunity to identify |

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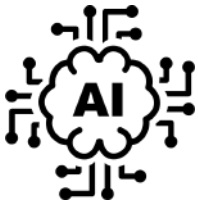
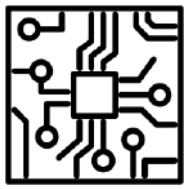
| | a need that they care about, prototype solutions both on paper and in App Lab, and test their solutions with real users to get feedback and drive further iteration. |
|   | **AI and Machine Learning**<br>In the AI and Machine Learning unit, students learn how computers can find patterns in data to make decisions. Students use the Problem Solving Process for machine learning to define a problem, prepare their data, train a model, then test and evaluate their model for accuracy and potential bias. Students explore a variety of scenarios and datasets that lend themselves to machine learning. They also explore some of the modern problems with machine learning, especially around bias and impact. |
|  | **Physical Computing**<br>In the Physical Computing unit, students further develop their programming skills, while exploring more deeply the role of hardware platforms in computing. Harkening back to the Input/Storage/Processing/Output model for a computer, students look towards modern "smart" devices to understand the ways in which non-traditional computing platforms take input and provide output in ways that couldn't be done with the traditional keyboard, mouse, and monitor.<br><br>Using App Lab and Adafruit's Circuit Playground, students develop programs that utilize the same hardware inputs and outputs that we see in many modern smart devices, and they get to see how a simple rough prototype can lead to a finished product. The unit concludes with a design challenge that asks students to use the Circuit Playground as the basis for an innovation of their own design. |

## Grading Policy

| Grading Scale | Grading Policy: |
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| 90% - 100% = A<br>80% - 89% = B<br>70% - 79% = C<br>60% - 69% = D<br>59% or below = F | 40% Assignments<br>25% Participation<br>25% Projects<br>10% Assessments |

**Late Work Policy**:
Late work ***will be*** *accepted up until the end of the quarter.* ***Late Projects*** *will get a 5% deduction for each week that they are late*. Incomplete work will be returned to students with feedback. Students need to use the feedback to make improvements to their work and they may re-submit their work for a better grade. Students who have an excused absence will be given a week to complete work missed during their absence and will not be deducted points. ***Students who are suspended*** must complete their work via Google Classroom and Code.org and adhere to all deadlines for assignments during their suspension, **make-up work will not be allowed if suspended**.

## Classroom Rules:

1. Be Safe
2. Be Respectful
3. Be Responsible

## Materials:

*It is the student's responsibility to come to class prepared each day. Please have the following materials ready daily:* **School Issued Chromebook w/charger & headphones**

## Expectations & Consequences:

If a problem arises regarding any of the classroom rules, the following consequences will apply: **1st** = WARNING, **2nd** = student/teacher conference, **3rd** = phone call home, **4th** = referral to the principal, **5th** = student is escorted to the office by security.

******Note that intimidation and teasing by other students will not be tolerated at any level in my classroom, if this behavior or any other unique situation arises, the previous discipline plan will be disregarded and administration will be involved immediately.******

I am a firm believer that in order for a student to be successful parent involvement is necessary. My door is always open to my students and their parents. Don't hesitate to call, email, or message me using ParentSquare if you have any questions or concerns.

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## Parent & Student Acknowledgment:

I read this syllabus with my parents and agree to follow all classroom rules and procedures. If I have any problems or questions about anything in this syllabus or something is done or said in this class all year, I agree it is my responsibility to speak to Ms. Viechec about my concerns.

Student signature _____

Parent signature _____