Center for Communication Technology Magnet
Course Description and Expectations
AP Computer Science Principles: semester 1
CE-CSC 119 Intro to Programming: semester 2
Instructor: Mr. Fornstrom
Credit: 5 credit hours each semester
Prerequisite: Computer Science 1
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Website: http://sfornstrom.tjspartans.org/

INSTRUCTOR BIO
I have taught in the TJ CCT Magnet program since 2000. I graduated from the University of Wyoming with a B.A. in Business Administration and from Texas A&M with a M.S. in Management Information Systems. Prior to teaching I worked as an accountant and a computer consultant for businesses.

COURSE DESCRIPTION
Computer Science 2 is a continuation of Computer Science 1. Completion of both semesters with a grade of "C" or better qualifies the student for **concurrent enrollment credit for CSC 119 – Introduction to Programming** at **Arapahoe Community College**. Additionally, the College Board offers a course called **AP Computer Science Principles**. We will follow the AP Computer Science Principles curriculum so that Computer Science 2 students will be prepared to pass the AP exam. The Computer Science Principles course is a great fit for CCT students because it emphasizes **problem solving** and **creativity.**

FEES
There will not be a class fee for CS2, however students are encouraged to take the **AP CS Principles exam**; the exam fee will be billed through TJ. Students are also encouraged to participate in the **TJ Skills USA** club, which will entail a membership fee that is paid to the state organization.

CLASS RULES AND CODE OF CONDUCT
All school rules and policies will be followed. School rules and policies are outlined in the student handbook and on the TJ website.

Thomas Jefferson Center for Communication Technology Magnet (CCTM) students are provided additional opportunities and resources which requires commitment and responsibility. For this reason, CCTM students are expected to be school leaders and exemplars by setting a positive tone at TJ.

Students are required to use all resources in a safe and respectful manner that contributes to the betterment of the program. Any deliberate misuse of resources or misconduct will be dealt with in accordance with school and district policies and may result in one or more of the following consequences: withdrawal from any/all CCTM courses, fines/fees to repair/replace materials, suspension/expulsion, possible additional legal action.

DAILY WORK POINTS
All students will be able to demonstrate positive work behaviors and personal qualities needed to be employable including professionalism, self direction, communication, collaboration and perseverance by employing teamwork skills, setting goals, using critical thinking skills, applying active listening skills, and using time management tools to produce quality work.

2 points per day. To demonstrate positive work behaviors:
- Students will be in class on-time.
- Students will use the entire period for project work.
- Students will not talk over other students or teachers.
- Students will not play on their phones or other devices.

LAB & OFFICE HOURS

The computer lab is open every day from 7am to 3pm for student project work. Mr. Fornstrom is available in the lab from 7am to 3pm, including during lunch. Please contact him to schedule an appointment or additional lab time.

GRADING

Grades are based upon assignments, programs, quizzes, and tests. There will also be several group projects. Each team member will earn both an individual grade and a group grade on each group project.

GRADING SCALE

90-100% = A
80-89% = B
70-79% = C
60-69% = D
Below 60% = F

Course Objectives and Curriculum Overview:

This course follows the College Board AP Computer Science Principles Framework. The main course objectives are summarized below in the 6 **computational thinking practices** and 7 **big ideas** for the course. For additional details of computational thinking practices and the big ideas, see the **AP Computer Science Principles and Exam Description**. The outline below is adapted from the **code.org syllabus**.

Computational Thinking Practices – represent important aspects of the work that computer scientists engage in.

- P1: Connecting Computing
  - Identify impacts of computing.
  - Describe connections between people and computing.
  - Explain connections between computing concepts.
- P2: Creating Computational Artifacts
  - Create an artifact with a practical, personal, or societal intent.
  - Select appropriate techniques to develop a computational artifact.
  - Use appropriate algorithmic and information management principles.
- P3: Abstracting
  - Explain how data, information, or knowledge is represented for computational use.
  - Explain how abstractions are used in computation or modeling.
  - Identify abstractions.
  - Describe modeling in a computational context.
- P4: Analyzing Problems and Artifacts
  - Evaluate a proposed solution to a problem.
  - Locate and correct errors.
  - Explain how an artifact functions.
  - Justify appropriateness and correctness of a solution, model, or artifact.
- P5: Communicating
  - Explain the meaning of a result in context.
  - Describe computation with accurate and precise language, notations, or visualizations.
  - Summarize the purpose of a computational artifact.
- P6: Collaborating
  - Collaborate with another student in solving a computational problem.
  - Collaborate with another student in producing an artifact.
  - Share the workload by providing individual contributions to an overall

collaborative effort.
    - Foster a constructive, collaborative climate by resolving conflicts and facilitating the contributions of a partner or team member.
    - Exchange knowledge and feedback with a partner or team member.
    - Review and revise their work as needed to create a high-quality artifact.

Big Ideas - The seven big ideas of the course encompass foundational ideas of the field of computer science, and are denoted here by B1 through B7.

- B1: Creativity
    - How can a creative development process affect the creation of computational artifacts?
    - How can computing and the use of computational tools foster creative expression?
    - How can computing extend traditional forms of human expression and experience?
- B2: Abstraction
    - How are vastly different kinds of data, physical phenomena, and mathematical concepts represented on a computer?
    - How does abstraction help us in writing programs, creating computational artifacts, and solving problems?
    - How can computational models and simulations help generate new understanding and knowledge?
- B3: Data and Information
    - How can computation be employed to help people process data and information to gain insight and knowledge?
    - How can computation be employed to facilitate exploration and discovery when working with data?
    - What considerations and tradeoffs arise in the computational manipulation of data?
    - What opportunities do large data sets provide for solving problems and creating knowledge?
- B4: Algorithms
    - How are algorithms implemented and executed on computers and computational devices?
    - Why are some languages better than others when used to implement algorithms?
    - What kinds of problems are easy, what kinds are difficult, and what kinds are impossible to solve algorithmically?
    - How are algorithms evaluated?
- B5: Programming
    - How are programs developed to help people, organizations, or society solve problems?
    - How are programs used for creative expression, to satisfy personal curiosity, or to create new knowledge?
    - How do computer programs implement algorithms?
    - How does abstraction make the development of computer programs possible?
    - How do people develop and test computer programs?
    - Which mathematical and logical concepts are fundamental to computer programming?
- B6: The Internet
    - What is the Internet? How is it built? How does it function?
    - What aspects of the Internet's design and development have helped it scale and flourish?
    - How is cybersecurity impacting the ever-increasing number of Internet users?
- B7: Global Impact
    - How does computing enhance human communication, interaction, and cognition?

- How does computing enable innovation?
- What are some potential beneficial and harmful effects of computing?