AP Computer Science Principles

**AP Computer Science Principles** is a new course launched in the Fall 2016 that introduced students to the foundational concepts of computer science and challenges them to explore how computing and technology can impact the world. With a unique focus on creative problem solving and real-world applications, AP Computer Science Principles prepares students for college and career.

**Computer Science: The New Literacy**
Whether it’s 3-D animation, engineering, music, app development, medicine, visual design, robotics, or political analysis, computer science is the engine that powers the technology, productivity, and innovation that drive the world. Computer science experience has become an imperative for today’s students and the workforce of tomorrow.

**Why Computer Science?**
Every 21st century student should have the opportunity to learn computer science (CS). The basics of CS help nurture creativity and problem-solving skills, and prepare students for a future in any field or career.

AP Computer Science Principles offers a multidisciplinary approach to teaching the underlying principles of computation. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. This course will give students the opportunity to use technology to address real-world problems and build relevant solutions. Together, these aspects of the course make up a rigorous and rich curriculum that aims to broaden participation in computer science.

For more information, see the College Board websites:
https://advancesinap.collegeboard.org/stem/computer-science-principles
https://apstudent.collegeboard.org/apcourse/ap-computer-science-principles

This is a full year course available to all students with a strong Algebra background and preferably completion of Principles of Engineering or a CAD course to show basic fluency with a computer.

These courses are offered through our Career and Technical Education Department, [http://cte.coniferhs.org](http://cte.coniferhs.org) and count toward your Practical Arts graduation requirement.

Club and Student Organization:  Robotics Club
Team Blitz, [http://teamblitz.net/](http://teamblitz.net/) meets here at Conifer High School,
Tuesday Evenings in Room A33.

More information? contact Eric Halingstad
Conifer High School, 10441 Hwy 73, Conifer, CO 80433

[ehalings@jeffco.k12.co.us](mailto:ehalings@jeffco.k12.co.us) - 303.982.5273
This course will follow Code.org’s syllabus for AP Computer Science Principles.

Objectives:
This course will engage students in learning activities that will help them to see that:

- Computing is a creative activity
- Computing is a problem-solving activity
- Computing is a collaborative activity

Prerequisites:
It is not necessary for a student to have extensive computing experience before taking this class. It is recommended, but not necessarily required, to complete one of the following courses first:

- Algebra or Algebra 2
- Engineering Principles
- Engineering Design (CAD)

Course Work:
AP Computer Science Principles introduces students to the foundational concepts of computer science and challenges them to explore how computing and technology can impact the world. With a unique focus on creative problem solving and real-world applications, AP Computer Science Principles prepares students for college and career.

Expectations:
This is an Advanced Placement class. As such, there will be greater expectations and responsibilities. You are expected to exhibit strong academic behaviors and conscientiousness throughout the school year. You can expect this class to be challenging, but as long as you stay organized, use your class time wisely, follow directions in class carefully, work hard in class and at home, you will be successful and make yourself proud. You will also be gaining the knowledge and work habits that will contribute to your success in high school and beyond.

Materials:
3-ring notebook with dividers to keep notes and handouts - may be kept in the classroom
spiral or science notebook with graph paper
pencils, blue, black and red pens
USB Flash drive

Website:
You can access my website from the Conifer High School home page. At this website, you will find a daily class schedule, assignments, due dates, and handouts. Please check this website and the Google Classroom often, particularly when you are absent.
Extra Help:
You can find me before school, during Seminar and after school. I have 2 different rooms - A033 and my office A005, so either check both or ask beforehand where I will be. Please come in if you have questions, need help, or have make-up work to complete.

Grades:
Your grade will be based on the following categories of assignments:

- Daily or Shorter Homework and Classwork Assignments (30%)
- Longer Assignments, Projects & Tests/Quizzes/Assessments (70%)

Your letter grade will be determined from your weighted percentage, according to the following scale:

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

I will post grades regularly on the Campus Portal web system. It is your responsibility to check your grade regularly, and to talk to me if you have questions or concerns.

Make-up Work:
You must make up all assignments you miss because of absences. For every excused absence, you will have 2 school days to complete and turn in makeup work. It is your responsibility to ask for the work, and to return it in on time. It is in your interest to complete makeup work as soon as possible.

Late Work:
Assignments turned in late will receive half credit for one week, then no credit. No late work will be accepted beginning one week before finals.

Working at Home:
You will need to complete some assignments and projects at home, so you will also need to be able to install software on a home computer. This may include browsers and plugins, programming languages and other utility programs. You will only be asked to install well-tested software, and you will be provided with instructions and help, if necessary.

Lab Policies:
- No food or drink allowed - Water in bottle on the floor or on the counter by the refrigerator.
- Must use only your own log in
- Computers are to be logged out of at the end of your session
- Students should not be working on work from other classes
- Students should not be wearing headphones without permission
- All completed work should be reflected in student journal
- No mobile devices unless approved by Mr. Halingstad

Class Expectations:
- Come to class everyday on time and prepared to learn with your materials.
- Respect your learning environment, your peers and your instructor.
- You are expected to manage yourself and your time effectively. If you have trouble managing yourself, Mr. Halingstad will be happy to assist you through preferential seating, confiscation of distractions, extra time outside of class, etc. Please make sure you are not distracted by:
- Cell phones, iPods, electronics, etc. (Music device are allowed during specified times).
- Follow appropriate workplace etiquette regarding all electronics.
- Inappropriate behavior, language, and/or attitudes that disrupt the learning environment.
- Cheating or plagiarism (this will not be tolerated, and will result in a non-negotiable 0 on the assignment)

Class Rules - Tardy Policy:
1st Tardy = Verbal Warning
2nd Tardy = Loss of hall privileges for that class period
3rd Tardy = Loss of hall privileges for the semester
4th Tardy = Referral to office

Class Rules – Academic Integrity/Plagiarism:
Conifer High School actively encourages students to incorporate the Lobo Honor Code in every aspect of their daily lives. The honor code, rooted in the virtues of **Honesty, Integrity, Respect, and Responsibility**, is the core of Lobo pride. Occasionally, this trust is violated when academic misconduct occurs, either inadvertently or deliberately. Academic misconduct includes, but is not limited to, plagiarism, cheating, fabrication, and knowingly making possible any act of misconduct. Violations of **academic integrity** may result in actions outlined in the CHS Honor Code. Serious and/or habitual violations of the Honor Code will be subject to administrative review and may result in consequences as outlined in the Jefferson County Code of Conduct.

Robotics Club:
Team Blitz, No. 2083, meets here on Tuesdays at Conifer High School. High school-aged teams compete head to head on a special playing field with robots they have designed, built, and programmed.

Technical Student Association:
Conifer High School is investigating the idea of forming a CHS chapter of the **Technical Student Association** (TSA). TSA members can be involved in leadership activities, and participate in competition events such as Software Design, Technology Problem Solving and Video Game Design.

Related Careers & Majors
Students who are interested in computer science may be interested in these college majors and careers:

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<thead>
<tr>
<th>Related College Majors</th>
<th>Related Careers</th>
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<tbody>
<tr>
<td>• Computer Engineering, General</td>
<td>• Computer Programmers</td>
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<tr>
<td>• Computer Forensics</td>
<td>• Computer Scientists</td>
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<tr>
<td>• Computer Software Engineering</td>
<td>• Computer Systems Analysts</td>
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<tr>
<td>• Electrical Engineering</td>
<td>• Computer and Information Systems Managers</td>
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<tr>
<td>• Game and Interactive Media Design</td>
<td>• Management Consultants</td>
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<tr>
<td>• Information Science</td>
<td>• Software Developers</td>
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<td>• Mathematics Teacher Education</td>
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<td>• Neuroscience</td>
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(For more information, see *AP and your future, by The College Board*)
AP® Computer Science Principles
Code.org’s Computer Science Principles (CSP) curriculum is a full-year, rigorous, entry-level course that introduces high school students to the foundations of modern computing. The course covers a broad range of foundational topics such as programming, algorithms, the Internet, big data, digital privacy and security, and the societal impacts of computing.

Course Snapshot
To the right is a snapshot of the course. The course contains five core units of study, with a sixth unit devoted almost exclusively to students working on their AP Performance Task (PT) projects. Each unit has one or two “chapters” of related lessons that usually conclude with some kind of project or summative assessment. A timeline showing a typical school year is shown to give a rough estimate of pacing. Note: the performance task submission deadline is the end of April, and the written AP Exam is May 5, 2017.

AP Endorsed
Code.org is recognized by the College Board as an endorsed provider of curriculum and professional development for AP® Computer Science Principles (AP CSP). This endorsement affirms that all components of Code.org CSP’s offerings are aligned to the AP Curriculum Framework standards and the AP CSP assessment. Using an endorsed provider affords schools access to resources including an AP CSP syllabus pre-approved by the College Board’s AP Course Audit, and officially recognized professional development that prepares teachers to teach AP CSP.

Code.org Endorsed
Syllabus ID #1648108v1

AP is a trademark registered and owned by the College Board.
**Curriculum Overview and Goals**
Computing affects almost all aspects of modern life and *all* students deserve a computing education that prepares them to pursue the wide array of intellectual and career opportunities that computing has made possible.

This course is not a tour of current events and technologies. Rather, this course seeks to provide students with a “future proof” foundation in computing principles so that they are adequately prepared with both the knowledge and skills to live and meaningfully participate in our increasingly digital society, economy, and culture.

The Internet and Innovation provide a narrative arc for the course, a thread connecting all of the units. The course starts with learning about what is involved in sending a single bit of information from one place to another and ends with students considering the implications of a computing innovation of their own design. Along the way students learn:

- How the Internet works and its impacts on society.
- How to program and rapidly prototype small JavaScript applications both to solve problems and to satisfy personal curiosity.
- How to collect, analyze and visualize data to gain insight and knowledge.
- How to evaluate the beneficial and harmful effects to people and society brought on by computing innovations.

**Addressing Diversity, Equity, and Broadening Participation in the Curriculum**
A central goal of Code.org’s CSP curriculum is for it to be accessible to all students, especially those in groups typically underrepresented in computing. To this end, we have worked to provide examples and activities that are relevant and topical enough for students to connect back to their own interests and lives. Wherever possible, and especially in the videos that accompany the curriculum, we seek to highlight a diverse and impressive array of role models in terms of gender, race, and profession from which students can draw inspiration and “see themselves” participating in computing.

The curriculum assumes no prior knowledge of computing and is written to support *both* students and teachers who are new to the discipline. Activities are designed and structured in such a way that students with diverse learning needs have space to find their voice and to express their thoughts and opinions. The activities, videos, and computing tools in the curriculum strive to have a broad appeal and to be accessible to a student body diverse in background, gender, race, prior knowledge of computing, and personal interests.

Broadening student participation in computer science is a national goal, and effectively an issue of social justice. Fancy tools and motivational marketing messages only get you so far. We believe that the real key to attracting students to computer science and then sustaining that growth has as much to do with the teacher in the classroom as it does with anything else. The real “access” students need to computing is an opportunity to *legitimately and meaningfully participate in every lesson* regardless of the student’s background or prior experience in computing coming into the course. For example, the course begins with material that is
challenging but typically unfamiliar even to students who have some prior experience or knowledge of computer science. Students should not feel intimidated that others in the class are starting with a leg up on the material.

Who Should Take This Course?

There are no formal prerequisites for this course, though the College Board recommends that students have taken at least Algebra 1. The course requires a significant amount of expository writing (as well as writing computer code, of course). For students wishing to complete the requirements of the AP Exam and Performance Tasks, we recommend they be in 10th grade or above due the expectations of student responsibility and maturity for an AP course.

The curriculum itself does not assume any prior knowledge of computing concepts before entering the course. It is intended to be suitable as a first course in computing though students with a variety of backgrounds and prior experiences will also find the course engaging and with plenty of challenges. While it is increasingly likely that students entering this AP course in high school will have had some prior experience in computer science (particularly with programming), that experience is equally likely to be highly varied both in quantity and quality. It is for this reason that the course does not start with programming, but instead with material that is much more likely to put all students on a level playing field for the first few weeks of class. Read more about this below in the description of Unit 1.