# AP Computer Science

Synopsis 2023 - 2024

## Description

*Computer Science* encompasses all aspects of computation, including theoretical aspects, electrical engineering, and software design. However, the AP course focuses on programming; the key to success on the AP examination is learn the Java programming language. There are two aspects to this; one must be able to read and interpret code, and one must be fluent in writing code.

It is essential that student practice programming outside of the classroom. Developing software is a creative process which requires time. It may take hours to think through, code, and debug a good program.

Students are required to have a computer available during class and at home. It is *strongly* suggest that students have their own laptop, which they will bring to class every day, and take home at night to continue their work. Instructions for use of the operating system will assume that the student is using Microsoft Windows operating system. Any students who insist on using Apple computers or Linux are completely responsible for understanding how use the command line, editors, and file system, of macOS.

## Course Information

**Teacher:** Dr. Paul Bailey

**Email:** `pbailey@sonoranschools.org`

**Website:** `http://plbailey79.github.io/portal`

**Text:** *Java - An Introduction to Problem Solving & Programming*, 6$^{\text{th}}$ edition, Savitch and Carrano, 2012

## Grading Scale

ALL students are expected to take the AP End of Course Examination. Students should not expect to pass this class unless they are able to pass the AP Exam. Letter grades are targeted to reflect the students projected AP Exam Score.

| AP Score | Letter Grade |
|---|---|
| 5 | A |
| 4 | B |
| 3 | C |
| 2 | D |
| 1 | F |

## Grade Components

| | |
|---|---|
| **Classwork:** | 20% |
| **Homework:** | 10% |
| **Quizzes:** | 20% |
| **Exams:** | 30% |
| **Projects:** | 20% |

*Classwork* consists of attendance and participation in discussion, and activities such as team quizzes, worksheets, and other group work. Classwork activities are normally be graded on a scale of zero to ten.

*Homework* consists of reading checks. These are short (ten minute) assessment wherein students demonstrate that they have done the reading.

*Quizzes* are about twenty minutes long and occur weekly on Friday, and may cover recent or accumulated material. These will be graded on a scale of zero to ten.

*Examinations* are an hour long written assessments. As the year progresses, these will become increasingly similar to actual AP exams. They will be graded on a scale of zero to one hundred points.

*Projects* are lengthly, detailed programming assignments.

**Course Outline**

This course outline is an approximation and is subject change as we proceed.

| Semester | Week | Monday | Topic | Savitch Sections |
|---|---|---|---|---|
| 1 | 1 | 07/31/23 | Command Line | |
| 1 | 2 | 08/07/23 | Java and Data | 1 |
| 1 | 3 | 08/14/23 | Variables and Expressions | 2 |
| 1 | 4 | 08/21/23 | Functions | |
| 1 | 5 | 08/28/23 | Flow Control: Branching | 3 |
| 1 | 6 | 09/04/23 | Flow Control: Looping | 4 |
| 1 | 7 | 09/11/23 | Classes and Methods | 5.1 - 5.2 |
| 1 | 8 | 09/18/23 | Objects and Encapsulation | 5.3, 6.1 |
| 1 | 9 | 09/25/23 | Overloading and Overriding | 6.2 - 6.7 |
| 1 | | 10/02/23 | Fall Break | |
| 1 | 10 | 10/09/23 | Greenfoot: Crabs | |
| 1 | 11 | 10/16/23 | Greenfoot: Lobsters | |
| 1 | 12 | 10/23/23 | Arrays | 7.1 - 7.3, 7.5 |
| 1 | 13 | 10/30/23 | Searching Arrays | 7.4 |
| 1 | 14 | 11/06/23 | Sorting Arrays | 7.4 |
| 1 | 15 | 11/13/23 | Polymorphism, Inheritance, Abstraction | 8.1 - 8.3 |
| 1 | 16 | 11/20/23 | Thanksgiving Short Week | |
| 1 | 17 | 11/27/23 | Racko | |
| 1 | 18 | 12/04/23 | Racko | |
| 1 | 19 | 12/11/23 | Racko | |
| 2 | | 12/18/23 | Winter Break | |
| 2 | | 12/25/23 | Winter Break | |
| 2 | | 01/01/24 | Winter Break | |
| 2 | 1 | 01/08/24 | Exceptions | 9 |
| 2 | 2 | 01/15/24 | Text Streams | 10.1 - 10.3 |
| 2 | 3 | 01/22/24 | Binary Streams | 10.4 - 10.5 |
| 2 | 4 | 01/29/24 | Recursion | 11 |
| 2 | 5 | 02/05/24 | Array Lists | 12.1 |
| 2 | 6 | 02/12/24 | Linked Lists | 12.2 |
| 2 | 7 | 02/19/24 | Swing | |
| 2 | 8 | 02/26/24 | Swing | |
| 2 | 9 | 03/04/24 | Swing | |
| 2 | | 03/11/24 | Spring Break | |
| 2 | 10 | 03/18/24 | Numerical Analysis | |
| 2 | 11 | 03/25/24 | Numerical Analysis | |
| 2 | 12 | 04/01/24 | Cryptography | |
| 2 | 13 | 04/08/24 | Cryptography | |
| 2 | 14 | 04/15/24 | Graph Theory | |
| 2 | 15 | 04/22/24 | Graph Theory | |
| 2 | 16 | 04/29/24 | Gomoku | |
| 2 | 17 | 05/06/24 | Gomoku | |
| 2 | 18 | 05/13/24 | Gomoku | |
| 2 | 19 | 05/20/24 | Short Week | |