AP Computer Science

Syllabus 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.

We begin by studying a few background topics, including the history of computing, base conversions, data formatting, truth tables, and if time permits, basic circuits. This will be interlaced with learning the operating system's command line, writing and compiling simple programs from the command line. We proceed into concepts of object oriented programming, always with a hand-on approach. In due time, we will begin using the Netbeans IDE, and use its form generator to construct simple GUIs.

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* suggested 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 are completely responsible for understanding how use the 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

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	2	01/08/24	Exceptions	9
2	3	01/15/24	Text Streams	10.1 - 10.3
2	4	01/22/24	Binary Streams	10.4 - 10.5
2	5	01/29/24	Recursion	11
2	6	02/05/24	Array Lists	12.1
2	7	02/12/24	Linked Lists	12.2
2	8	02/19/24	Swing	
2	9	02/26/24	Swing	
2	10	03/04/24	Swing	
2		03/11/24	Spring Break	
2	11	03/18/24	Numerical Analysis	
2	12	03/25/24	Numerical Analysis	
2	13	04/01/24	Cryptography	
2	14	04/08/24	Cryptography	
2	15	04/15/24	Graph Theory	
2	16	04/22/24	Graph Theory	
2	17	04/29/24	Gomoku	
2	18	05/06/24	Gomoku	
2	19	05/13/24	Gomoku	
2	20	05/20/24	Short Week	