School: BASIS International School Shenzhen
Instructor: Neill Lee
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Course Description
"AP Computer Science A introduces students to computer science through programming. Fundamental topics in this course include the design of solutions to problems, the use of data structures to organize large sets of data, the development and implementation of algorithms to process data and discover new information, the analysis of potential solutions, and the ethical and social implications of computing systems. The course emphasizes object-oriented programming and design using the Java programming language." (College Board, 2019) Instruction includes preparation for the AP Computer Science A Exam.

Grading Policy
Course grading is consistent with the BASIS Parent/Student Handbook.

Trimester Grades:

• 20%--Participation
• 40%--Class & Home work
• 40%--Assessments at the end of each unit and/or grading periods

Final Course Grade:
Final Course Grade is calculated consistent with the AP score conversion table in the BASIS Parent/Student Handbook. The alternate final exam for those not taking the AP test will be weighted at 40% of the final grade, with the other 60% being the average of the trimester grades.

Classroom Policy
Our classroom values are: trust, responsibility, respect, integrity and perseverance. Students are expected to conduct themselves in accordance with the classroom values at all times.

Projects - What is project-based learning? Students are asked to solve new problems by planning a strategy, designing and producing solutions, and then reflecting on their solutions and strategies. Many of the world's problems today do not have single, simple solutions. In order to contribute effectively to these solutions, students should be comfortable working in a collaborative environment where diverse viewpoints are valued and failure is seen as necessary in the path towards a solution. Therefore, a majority of course points are allocated to weekly projects and a majority of class time will be devoted to working on these projects, collaborating with peers on a solution, and receiving assistance from the instructor.

Classroom Activities/Participation - Students who actively contribute to class discussion, ask/answer questions, and promote a respectful classroom environment will receive full credit for course participation. Computer Science courses utilize technology in the classroom and, as such, inappropriate uses of these resources will result in a loss of all participation points for that week. Inappropriate uses include, but are not limited to, social networking, gaming, instant messaging, internet browsing not related to course content, and malicious software coding. Repeated offenses will result
in an office referral and parent communication. Again, inappropriate use of technology in the classroom will not be tolerated - no warning will be given upon such activities.

**Assessments** - Short quizzes will be given each week to assess understanding of newly introduced topics. These quizzes provide students with valuable, regular, feedback on their performance in the course, and familiarize students with AP Style questions. Exams will occur approximately once every six weeks, and will consist of a variety of multiple choice and short answer questions. Exams will take one or more consecutive class periods, and a mock AP exam will be given in early spring.

### Instructional Materials

The list below represents examples of possible textbooks that meet the curricular requirements of AP Computer Science A. These are only provided as extra sources of information and should not be considered necessary for the course.


### Other Information

I recommend you use your own laptop with the following installed:

- A web browser:
  - Google Chrome is recommended.
  - If using Google Chrome install an Office Online Viewer extension:
    - e.g. Docs Online Viewer
      - [https://chrome.google.com/webstore/detail/docs-online-viewer/gmpljdqcikpljoppacpiacmdl/hfcon](https://chrome.google.com/webstore/detail/docs-online-viewer/gmpljdqcikpljoppacpiacmdl/hfcon)

The "AP Computer Science" section of my website (tinyurl.com/mrleeedu) will be the main resource.

- [https://d29eb5meqa6ct7.cloudfront.net/ap_cs.htm](https://d29eb5meqa6ct7.cloudfront.net/ap_cs.htm)
- See above for other suggested websites.

All emails to me ([neill.lee@basisinternationalsz.com](mailto:neill.lee@basisinternationalsz.com)) MUST:
• Have the following phrase in the Subject line:
  ◦ AP CS A
• Start with the student's full English name in the body.

Lesson Start Procedure (at the start of lessons all students must):

• Take out their laptop, turn it on and log in if necessary.
• Open up their Web Browser with 2 tabs:
  ◦ My website:
    ◦ AP Computer Science
  ◦ Their email (log in and make sure it is ready to use).
• CJ and Name Tag on desk

Work area within the computer must be organised:

• A folder named "AP CS" with further appropriately named folders for each unit.
  ◦ All work must saved appropriately within these folders.

AP Computer Science A - Course Syllabus 2019/2020 - Mr Lee

Student Full Name: ____________________________________ Student Signature: _________________________________________

Parent Signature: _____________________________________ Date: _______________________________________________
Syllabus Outline Lesson Units

Introduction to Java Programming
- State and describe common Java terms.
- State what needs to be installed to write, compile and run a Java program.
  How to Compile & Run your First Java Program

Data Types & Identifiers/Variables in Java
- Comments
  //

  Primitive Types
  int, double, boolean

  Operators
  Arithmetic: +, −, *, /, %
  Assignment: =, +=, −=, *=, /=, %=
  Numeric casts: (int), (double)
  Exception
  ArithmeticException

  Variables
  local variables, final

Conditionals & Control Flow
- Operators
  Relational: ==, !=, <, <=, >, >=
  Numeric casts: (int),
  Logical: !, &&, ||

  Control Statements
  if, if/else

Loops
- Operators
  Increment/Decrement: ++, --

  Control Statements
  for
  while

  Escape Sequences
  \", \, \n inside strings

Input
System.out.print

Strings & OOP Introduction
- String concatenation: +

  Object Comparison
  object identity (==, !) vs.
  object equality (equals),
  String compareTo

Input

Exceptions
NullPointerException
IndexOutOfBoundsException

Variables
  parameter variables,
  instance variables,

Methods
  static, non-static, method signatures, overloading, overriding, parameter passing
Classes
new, visibility (public)

Inheritance
Understand inheritance hierarchies.

Packages
import packageName.className

Miscellaneous OOP
"is-a" relationship, null, this

Standard Java Library
Object, Integer, Double, String

Arrays
Exceptions
ArrayIndexOutOfBoundsException,

Arrays
1-dimensional arrays
2-dimensional rectangular arrays, row-major order of 2-dimensional array elements
initializer list: { … }

Control Statements
for-each

Methods
static, non-static

Defining your own Static Methods
Defining your own Static Methods

Classes/Interfaces & Own use of OOP
Simple Objects, Constructors & Overloading
Complex Classes, Accessor & Mutator methods, Encapsulation, Overriding
“Has-a” = Objects that Contain Objects, final
Inheritance

ArrayLists
Standard Java Library
List<E>, ArrayList<E>

Recursion
Part of the problem-solving process is the statement of solutions in a precise form that invites review and analysis. The implementation of solutions in the Java programming language reinforces concepts, allows potential solutions to be tested, and encourages discussion of solutions and alternatives.

Control: Recursion

AP Review
Provide time to review released AP problems, discuss strategies, and take a practice exam.

AP Exam Weeks
AP Exams