**Computer Science Principles**

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E-116

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**Introduction**

This class provides a foundational knowledge of the Java programming language, object-oriented programming, and top down design. Through the individual application of covered topics in labs, broader application of sets of topics in assignments, and testing of knowledge of the underlying theory in examinations, students will gain the skills necessary to create Java applications and will be positioned to excel in future college level computer science courses.

**Topics**

* Hello Java
* Primitives
* Classes, Objects, References, and Encapsulation
* Arrays and ArrayLists
* Overloading, Junit
* File I/O
* Exceptions
* Inheritance
* Typecasting / instanceof
* Object class / class hierarchy
* Interfaces
* GUIs and MVC
* Algorithmic Analysis and Big-O
  + Searching
  + Sorting
* Data Structures
  + Lists
  + Trees
  + Set
  + Maps
  + Queues
  + Stacks
* Generic methods and classes
* Parallel Programming and threads

Topics subject to change based on student interest. Not all topics will be covered every semester.

**Prerequisites**

This course requires successful completion of **Computer Science Discoveries** in order to ensure students possess the computationally-oriented mindset and prerequisite knowledge to succeed in this class.

**Grade Breakdown**

40% - exams

40% - assignments

20% - labs

**Expectations**

As this class is oriented towards preparing students for collegiate level work, students are expected to possess a strong academic mindset and a heightened level of maturity.

**Expectations**