Computer Science 112: An Introduction to Computer Science 2

Jterm 2021

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Class: MTWRF 1-2:30 Zoom

Lab: MTWRF one of 10,11,3 Zoom

TA hours MTWRF 7-9 PM Sat and Sunday 1-3

Textbook: Any Java text that covers the object-oriented features should be fine as a reference. There are a number of online texts, including:

http://people.csail.mit.edu/phw/OnToJava/

Required work: Labs, project, class participation, and exams (midterm and final). All code must compile to be acceptable. Programs must be submitted electronically.

This course will have three basic goals:

Explore object oriented programming.

Continue to develop algorithmic problem solving skills, the ability to express solutions through programming and the ability to analyze them.

Begin the study of data structures.

Functions and methods provide a kind of abstraction called procedural abstraction. Object orientation provides another layer of abstraction beyond the creation of methods. This abstraction allows you to group together data and the methods that operate on them. We will be discussing OOP, and using its concepts to solve more complex problems. We will do our programming in **Java.**

Some of the possible topics in the course are listed below:

- Review of Basic Java
- Defining classes/Object creation

- Object allocation and garbage collection
- Interfaces
- Abstract methods and classes
- Class vs. instance methods, etc.
- Casting and type conversion

- Exceptions, errors and handling them
- Input and Output, including Files
- GUI programming/event-driven programming

- Stacks, Queues and Simple Lists
- ArrayLists
- Basic linked data structures

- Inheritance and the class hierarchy
- Overloading and Overriding
- Polymorphism

- Algorithm analysis

Tentative Lab Schedule – this will probably change!

Day 1 Lab 1	Review, Setup, 2D arrays, Image Processing
Day 2 Lab 2	Classes, instance fields and methods
Day 4 Lab 3	Using an Interface – Queues and the Augustine Problem
Day 5 Lab 4	Implementing the Queue Interface
Day 7 Lab 5	Inheritance
Day 9 Lab 6	Stacks, Generics and ArrayLists
Day 10 Lab 7	GUI Game **(Midterm around here)**
Day 12 Lab 8	Project Intro
Day 14 Lab 9	Linked Lists

“Self scheduled labs”

Exceptions

Packages