

CSCI 70900 - Programming in a high level language

Course Description

Programming in a high level language introduces students to computer programming and goes well beyond an introductory class. The course will provide an overview of a language such as Java language and dive into important programming concepts including object-oriented programming, inheritance, exception handling, debugging techniques and more.

Schedule

- June 28 - July 8, Monday - Friday 9:00 - 3:00

Grading

- 80% : Projects/programming assignments (listed by topic)
- 20% : Participation

By the end of this course, students will be able to:

1. Understand the basics of object oriented computer programming including classes, methods, variables, data flow, data types and data structures.
2. Write programs of moderate complexity
3. Acquire data from outside sources and use programming techniques to analyze data and visualize results.
4. Use techniques from the field of computer science and apply them to problems in other fields.

Texts

Text <https://books.trinket.io/thinkjava/>

Standards Summary

Area	Standards covered
IC	3
CT	1,2,4,5,6,7,8,9
DL	4,5,6

Pework (each topic includes a programming assignment)

See specific pre-work topic web page for readings, assignment and other details (<https://github.com/hunter-teacher-cert/pre-work>).

1. Setting up a Java development environment and GitHub
 - DL 4,5,6
2. Your first Java program.
3. data Types
4. Void methods
5. Conditionals
 - Standards
 - CT 8
6. Value Methods
7. Loops
 - Standards
 - CT 6, 8
8. Arrays
 - Standards
 - CT 2,5,7
9. Craps game program (project)
 - Standards
 - IC 3
 - CT 4,7

Topics

1. June 28
 - Pework review
 - toolset (Repl.it, Javac, Git, GitHub, Editor)
 - Lab - game of Nim
 - Standards
 - DL 4,5,6
 - CT 4,6,7,8
 - IC 3
2. June 29
 - 1D arrays
 - Lab - Simplified Mancala
 - Assignment - Mancala enhancement
 - Standards
 - CT 2,5,7
3. June 30
 - Fundamental Recursion
 - Lab - recursion lab (Fibonacci 3 ways)
 - Divided Difference square root approximation
 - assignment square root approximation implementation
 - Standards

- CT 4,5,9
- 4. July 1
 - Reading: https://chortle.ccsu.edu/Java5/Notes/chap49C/ch49C_1.html
 - lab: 2D Array lab
 - Conway's game of life and Cellular Automata overview
 - lab + assignment: Conway's Game of Life implementation
 - Standards
 - CT 9
- 5. July 2
 - Conway's game of life continued
 - other CA
 - GOL as Turing Machine
 - Optional: 2D Graphics in Java (Think Java Appendix B)
 - Standards
 - CT 1,4,7,10
- 6. July 6
 - Introduction to classes Classes
 - Reading: Think Java Chapters 10 and 11
 - lab: Time Class lab
 - SuperArray introduction
 - lab / assignment: SuperArray part 1
 - Standards
 - CT 6,10
- 7. July 7
 - SuperArray review and part 2 discussion
 - lab: SuperArray part 2
 - Assignment: SuperArray enhancements
 - Standards
 - CT 4,5,6
- 8. July 8
 - Sorting
 - N^2 sorts
 - lab: n^2 implementation and analysis
 - Searching
 - lab: binary search lab
 - Standards
 - CT 6,7

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