COSC 4301 (Programming for Graduate Students)
Course Syllabus
Fall 2011

Learning Objectives:

By completing this course, students will be able to

1. **Perform some basic UNIX functions in (a) developing/running Java programs, (b) file creation/editing and other managements and (c) communications and file transfer.**
2. **Design and run java programs based on object-oriented approach utilizing Java packages and used defined classes and their objects and methods.**
3. **Gain good understanding of program design skills including recursion, inheritance and exception handling.**
4. **Gain practical understanding of some basic data structures including stacks, queues, dynamic arrays, binary trees and linked lists.**
5. **Design some graphical user interfaces using components, events and listeners.**

Topics to cover:

1. Introduction to basic language topics
   a. Language Primitive Data types
   b. Control structures
   c. Input/output
   d. Functions
   e. Introduction to Classes and objects

2. Introduction to Linux/Unix environment
   a. Compilation
   b. Editing
   c. Execution
   d. Submission
   e. File System and movement
   f. Other Linux topics as time allows

3. Some basic programming techniques.
   a. Constructors and Copy constructors
   b. Shallow and deep copying
   c. public versus private
   d. Polymorphism
   e. Exception handling
   f. Debugging techniques

4. Aggregate processing
   a. Arrays (Including dynamic arrays)
   b. Simple searching and sorting
   c. Strings and string processing
   d. Multi-dimensional
   e. Array based DS using classes
      1. Stacks
      2. Queues

Test-1

5. Recursion
   a. Direct
   b. Mutual
   c. Characteristics of a valid recursive algorithm

6. Some advanced programming techniques.
   a. Inheritance
   b. Interfaces
   c. Generics
   d. Overloading by refinement

7. Double Linked Lists
   a. Merge Sort
   b. Open Hashing
   c. Radix sort

Test-2

8. Binary trees and tree algorithms
   a. BST, insertion and removal
   b. Huffman Code
   c. Tree traversals
   d. Heaps and heap sort

Grading methods:

2 tests (OPEN): 200 points
Final Exam (OPEN): 200 points
8 or more programs: 160 points
{ Programs include:

1. Screen input/output and Loop iteration counting
2. Sorting (Select and Quick)
3. Character methods, Palindrome testing and File Inputs
4. Class Matrix design, Determinant and Inverse calculation and File Outputs
5. Linked list operations such as Insertion, Deletion and Copying
6. Binary Search Tree methods such as Insertion, Deletion, Copying and Locating a target element.
7. Stack and Postfix evaluation
8. Applet and Animation
9. Javascript for Form elements and Event Handling

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Occasional Quizzes: 40 points

TOTAL MAX: 600 points

If your class average is:

88% or higher:	A
Else 78% or higher:	B
Else 68% or higher:	C
Else:	D