CSE Freshman Course Sequence

CSE 1310: "Introduction to Computers and Programming" (prerequisite: MATH 1302)

Course Objectives and Outcomes: This course introduces basic computer concepts and computer software design with an emphasis on problem solving and algorithmic development. Upon completion of this course, the student should be able to demonstrate these techniques and principles by developing computer programs in the C programming language.

Topics:
- Computer organization
- Operating systems
- Number conversions (binary, decimal, hexadecimal)
- Writing programs (basic program design, editing, compiling, executing, testing, debugging)
- Scalar data types (int, float, char, etc.)
- Good Coding Practices (readability, robustness, correctness, divide and conquer)
- Input/Output, including file I/O
- Arithmetic/Relational operators
- Selection structures (if, switch/case)
- Repetition structures (for, while, do-while)
- Arrays (one-dimensional)
- Functions (built-in, user-defined, parameter passing - by value and by reference, returning values)
- Character array processing

CSE 1320: "Intermediate Programming" (prerequisite: CSE 1104, CSE 1105, CSE 1310 or (CSE 1311); and MATH 1323 (or concurrently).

Course Objectives and Outcomes: For students with basic programming skills, this course continues development of the student’s capabilities in programming beyond standard control structures in C/C++, consistent with software engineering principles. Students successfully completing this course will be able to apply structured, top-down design and software engineering techniques to the analysis and procedural design of moderately complex computer programming problems.

Topics:
- Software design
- Algorithms
- Pseudo code
- Software Engineering
- The Software Development Lifecycle (SDLC)
- SDLC Models
- Structured process steps (requirements analysis, design, implementation, testing, and maintenance)
- ANSI C language elements
- Scalar data types (int, float, char, etc.)
- Operators (arithmetic, relational, boolean, bitwise logical)
- Selection structures (if, switch/case)
- Repetition structures (for, while, do-while)
- Arrays (single- and multi-dimensional)
- Functions (built-in, user-defined, parameter passing - by value and by reference, returning values)
- Character array processing, strings
- Input/Output, including file I/O (both text and binary files)
- Recursion
- Pointers and dynamic memory allocation
- Elementary data structures (record structures, stacks, queues, linked lists)
- Double indirection
- The C preprocessor
- Command line arguments
- C library functions
CSE Freshman Course Sequence (continued)

CSE 1325: "Object-Oriented Programming" (prerequisite: CSE 1320)

Course Objectives and Outcomes: Program design and implementation using Java. Object-oriented concepts, basic Unified Modeling Language (UML) modeling, collection classes, generics, reflection, reusability and introduction to design patterns. Projects involve extensive programming and may include user interfaces and multithreading.

Questions for the CSE 1325 "Object-Oriented Programming" exit exam may come from the following topics:

Topics:  1. Class libraries  
          2. Java API  
          3. Concrete classes  
          4. Abstract classes  
          5. Interfaces  
          6. References and objects  
          7. Method prototypes  
          8. Concrete methods  
          9. Abstract methods  
         10. Formatted input/output  
        11. Strings  
        12. Characters  
        13. Type-wrap classes  
        14. Arrays  
        15. Random number generation  
        16. Garbage collection  
        17. Data structures  
        18. Inheritance  
        19. Polymorphism  
        20. Event handling  
        21. GUI components  
        22. Layout managers  
        23. Graphics  
        24. Exception handling  
        25. Files and streams  
        26. Recursion  
        27. Searching and sorting  
        28. Generics  
        29. Collections  
        30. Java applications  
        31. Java applets