Objectives for Course CSCI243

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In this course we will . . .

Learn how to design, debug, build and test C language programs,
Learn how an operating system supports programs and programmers,
Learn how a compiler builds program binaries, and
Practice analyzing problems and developing structured designs.

1 Course Description (SIS)
Here is the official course description:

“Students will be introduced to the details of program structure and the mechanics of execution as well as supportive operating system features. Security and performance issues in program design will be discussed. The program translation process will be examined. Programming assignments will be required.”

2 A ‘Dissection’ of the Description

We will be covering these topics and concepts:

• program structure down to the binary level;
• operating system support features, which includes system commands, the application programming interface (API) and program memory model/layout;
• program translation from high level sources to the binary executable; and
• security and performance issues.

“But Wait! There’s More”

• Terminal shell, editors, miscellaneous tools, manual pages;
• C language syntax;
• gcc, the compiler and cpp, the C preprocessor;
• C pointers, dynamic memory, memory management and virtual memory;
• Debugging with gdb and valgrind;
• Modules and libraries;
• I/O using both library functions and system calls;
• Developing abstract data types(ADTs) in a non-object-oriented language;
• Low Level I/O, Binary Arithmetic, Bitwise Operations;
• Process creation, scheduling and control; and
• Multithreaded programming with POSIX threads.