Princeton University
COS 217: Introduction to Programming Systems
Spring 2003 Midterm Exam Preparation

You are responsible for all material covered in lectures, precepts, and the assigned readings.

Topics

Programming style
> Modularity, interfaces, implementations
> Abstract data types
> Abstract objects
> Testing strategies
> Profiling and instrumentation
> Robust programming, error handling strategies

Advanced C programming
> Memory layout
> Dynamic memory management
> Void pointers
> Function pointers
> Variable declarations and definitions
> Variable scope, linkage, and duration
> Const variable declarations and definitions
> Function declarations and definitions
> Opaque pointers
> Macros and their dangers
> The assert macro
> Unions, enumerations, tagged unions

The UNIX/GNU programming environment
> Emacs, gcc, gdb, make, gprof

Digital Circuits
> Combinational Circuits
>> Building blocks: NOT, AND, and OR gates
>> Common combinational circuits: decoder, multiplexer, demultiplexer, adder, ALU
> Designing combinational circuits using NOT, AND, and OR gates
>> Truth tables
>> Boolean expressions in sum of products form

Sequential Circuits
       Building blocks: RS flip flops, clocked RS flip flops, clocked D flip flops, Clocked master slave D flip flops
       Common sequential circuits: register, register bank, memory
Designing sequential circuits using clocked master slave D flip flops
       State machines
       Truth tables
       Boolean expressions in sum of products form

Applications
       String manipulation
       Hash tables, symbol tables
       Digital circuit simulation

Readings

Extracted from the course web pages:

Loukides: 3, 4, 6, 7, 9
King: 10, 15, 16.4-5, 17, 18, 19

Old Exam Questions

These old exam questions are particularly pertinent:

Fall 2002 Exam 1: 3, 4, 5

Fall 2002 Exam 2: 2, 4a, 5

Spring 2002 Exam 1: 1, 2, 3, 4, 5, 6, 8, 9 (generally, although the Set ADT is not pertinent)

Fall 2001 Exam 1: 3, 4, 5, 6, 10