# Princeton University
# COS 217: Introduction to Programming Systems
# Spring 2004 Midterm Exam Preparation

## Topics

*You are responsible for all material covered in lectures, precepts, and required readings.*

C programming
- The program preparation process
- Memory layout
- Data types
- Operators
- Statements
- Function declarations and definitions
- Pointers
- Arrays
- Command-line arguments
- Constants
- Text files
- Structures
- Dynamic memory management
- Void pointers
- Function pointers
- Variable declarations and definitions
- Variable scope, linkage, and duration
- Macros and their dangers
- The assert macro

Programming style
- Modularity, interfaces, implementations
- Multi-file programs using header files
- Opaque pointers
- Abstract data types
- Testing strategies
- Profiling and instrumentation
- Robust programming, error handling strategies

Applications
- “De-commenting” and lexical analysis via finite state automata
- String manipulation
- Symbol tables and hash tables

Tools: The UNIX/GNU programming environment
- UNIX, bash, xemacs, gcc, and gdb from the user's point of view

## Readings

As specified on the course web pages...

Required:

King (*C Programming*): 1-15, 16.1-3, 17-19

Kernighan & Pike (*The Practice of Programming*): 1, 2, 4, 5, 6

Recommended:

Loukides & Oram (*Programming with GNU Software*): 2, 3, 4, 6, 9

Kernighan & Ritchie (*The C Programming Language*): 1, 4.11, 5

Hanson (*C Interfaces and Implementations*): 3.2