

Phd Qualifying Exam Topics: *Software Engineering*

Data and Representation in Hardware

- Number Systems
- Fixed-point and Floating-Point Arithmetic
- Strings and other kinds of data

Data Structures

- Arrays and Sparse matrices
- Lists, Stacks, and Queues
- Trees and Graphs

Algorithms

- Iteration and Recursion
- Deterministic and Nondeterministic
- Complexity

Concurrency

- Problems : Nondeterminism, Deadlocks, etc
- Primitives : Interrupts, Events, Semaphores, RPC
- Programming Structures: Critical Regions, Monitors, Rendezvous

Software Specification

- Requirements Definition
- System Modeling
- Specification Languages

Software Design

- Object Oriented Design
- Function-Oriented Design
- Real-Time Systems Design
- User Interface Design

Software Validation

- Test Plans
- Metrics and Reliability Modeling
- Static Verification

Review Texts:

CALL NO: QA76.9 D35 S59 1987

AUTHOR: Smith, Harry F.

MAIN TITLE: Data structures : form and function / Harry F. Smith.

PUBLISHER: San Diego : Harcourt Brace Jovanovich, c1987.

CALL NO: QA76.758 S657 1992

AUTHOR: Sommerville, Ian.

MAIN TITLE: Software engineering / Ian Sommerville.

EDITION: 4th ed.

PUBLISHER: Wokingham, England ; Reading, Mass. : Addison-Wesley Pub. Co.,

CALL NO: QA76.9 D35 A38 1983

AUTHOR: Aho, Alfred V.

MAIN TITLE: Data structures and algorithms / Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman.

PUBLISHER: Reading, Mass. : Addison-Wesley, c1983.

CALL NO: QA76.6 U44

AUTHOR: Ullman, Jeffrey D., 1942-

MAIN TITLE: Fundamental concepts of programming systems / Jeffrey D. Ullman.

PUBLISHER: Reading, Mass. : Addison-Wesley Pub. Co., c1976.

CALL NO: QA76.7 W39 1990

AUTHOR: Watt, David A. (David Anthony)

MAIN TITLE: Programming language concepts and paradigms / David A. Watt with contributions by William Findlay, John Hughes.

PUBLISHER: New York : Prentice Hall, 1990.