

**Midterm 2** will include material from Reed chapters 8 – 9 & 11 – 14.  
Exam will not be open book. Use two review sheets (one from 1<sup>st</sup> hourly).  
Skills tested on this exam:

- Ch. 8:
  - Specifying algorithms
  - Analyzing algorithms, i.e. how much time/work. *big-O( )* notation
  - *sequential* vs. *binary* search
    - what conditions are necessary
    - *least* time vs. *most* time required.
  - Newton's method & refinement
- Ch. 9: Functions:
  - parameters: specifying, calling, & using.
  - **return** values
  - global vs. local values (parameters & **var** variables)
  - use of **random( )** & other predefined functions
  - breaking a task into separate functions
  - *preconditions* & *postconditions*
- Ch. 11: Conditional Execution:
  - Boolean data & operators
  - relational operators
  - **if - then - else - else if** statements
  - nested **if**
  - cascading **if**
  - range determination. E.g. is a point (x, y) in a box? Are boundaries included?
  - fall-through vs. single-option (uses **breaks**) **switch** statements
  - **switch** statements vs. **if-else if**
  - DeMorgan's Law (for Boolean complements)
- Ch. 12: Data Representation:
  - bits vs. bytes, words, etc.
  - converting between bases (use of “/” and “%” operators)
  - floating point representation (which segment specifies range vs. precision)
  - how are characters represented?
  - analog/digital conversion (*basic ideas*)
- Ch. 13: Conditional Repetition
  - **while** loops
  - **do while** loops
  - **for** loops
  - when is it more appropriate to use a **for** than a **while** loop?
  - conversion between **for** and **while** loops (in either direction)
  - **continue** vs. **break** in **while** & **for** loop conversions.
    - Convert a **for** loop containing a **continue** statement into an equivalent **while** loop.
  - how much work is a loop performing?
  - what is the fewest times a loop will perform its body?
  - how many times will a loop perform its body? (as a function of a constant and of a variable)
  - infinite loop identification

SCSU CSCI 200 Elements of Computing  
Fall 2013 [A.A. Anda]

- Ch. 14: Inside the Computer – the Von Neumann Architecture
  - architecture components – their purposes and relationships
    - decoding an instruction
  - machine (binary) vs. assembly languages
  - the fetch-execute cycle
  - assembly language programming of the computer simulator.
    - load vs. store
    - looping & conditional execution