CSC258 Computer Organization 2011 Fall St.George

Course Outline

Circuit Technology
- analog and digital, semiconductors, diodes, transistors, logic gates, integrated circuits

Binary (Boolean) Algebra
- notations, unified algebra, laws, simplification
- binary expressions, value (truth) tables, circuit diagrams
- complete sets of gates

Useful Circuits
- encoder, decoder, multiplexer, demultiplexer
- time and delay, latch, pulse generator (clock), flip-flop, edge-trigger

Memory
- registers, random access memory (RAM), read-only memory (ROM)

Arithmetic
- incrementer, counter, adder, subtracter, multiplier, divider, arithmetic and logic unit (ALU)
- base conversion, negative integers, radix complement
- fractions, IEEE standard, quote notation

Data Representation
- data interchange codes (ASCII), error detection and correction codes

a Simple Computer
- compiler writer and machine language programmer's view
- machine instructions and assembly language
- machine architect and microprogrammer's view
- bus, register transfers, micro-programming, optimization
- timing: synchronous, asynchronous

Addressing
- indexing, indirection
- number of addresses (0 to 4)
- base registers, relocatability
- paging, associative memory

Input and Output
- channels, cycle stealing, interrupts

High-Level Circuit Design
- compiling from programs to circuits