CSCI 150 Outline
Assembly Language/Machine Architecture
Assembly Language for x86 Processors
by K. Irvine, Seventh Edition, Prentice Hall

Approved: Fall 14   **Effective: Spring 2015**

Topics	Sections	Time
Basic Concepts: Assembly language, applications, virtual machine concept, data representation, binary, hexadecimal, two's complement, Boolean operations	1.1 – 1.4	2.5 Hours
Processor Architecture: basic design, instruction execution cycle, floating-point unit, memory management (real-address mode and protected mode), major components, input/output system, 32-bit x86 vs. 64-bit x86	2.1 – 2.5	2.5 Hours
Assembly Language Fundamentals: basic elements of Assembly language, assembler (assembling and linking programs), defining data, symbolic constants, 64-bit programming	3.1 – 3.6	5 Hours
Data Transfers, Addressing, and Arithmetic: data transfer instructions, addition and subtraction, data-related operators and directives, indirect addressing, flags, jump and loop instructions	4.1 – 4.6	4 Hours
Procedures: linking to an external library, stack operations, defining and using procedures, saving and restoring registers, program design using procedures	5.1 – 5.5	2.5 Hours
Conditional Processing: Boolean and comparison operators, conditional jumps, conditional loops, conditional structures	6.1 – 6.5	2.5 Hours
Integer Arithmetic: shift and rotate instructions, multiplication and division, extended addition and subtraction, ASCII and packed decimal arithmetic (optional)	7.1 – 7.4	4 Hours
Advanced Procedures: local variables, parameters, pass by value and pass by reference, stack frames, memory models, recursion, creating multi-module programs, Java byte codes (optional)	8.1 – 8.5	3.75 Hours
Strings and Arrays: string primitive instructions, string routines, two-dimensional arrays, searching and sorting (optional)	9.1 – 9.5	2.5 Hours
Structures and Macros: structures and unions, macros (defining, invoking, and examples), macro functions	10.1 – 10.2	2 Hours
Memory Management, 32-Bit Windows Programming (optional), floating-point processing	11.1 – 11.4 12.1 – 12.2	2.5 Hours
High-Level Language Interface: general conventions, inline assembly code, linking to C++ programs	13.1 – 13.4	1.25 Hours
Disk Fundamentals: tracks, cylinders, sectors, partitions, file systems (FAT and NTFS), disk directory, reading and writing disk sectors, system-level file functions, decoding a FAT table (optional)	15.1 – 15.2	2 Hours
BIOS-Level Programming and DOS programming: BIOS-level keyboard input and VIDEO programming (optional), DOS function calls, DOS file I/O services, run-time program structure, interrupt handling, memory organization (cache and virtual memory)	14.1 16.1 – 16.3 17.1 – 17.5	3 Hours

Submitted by: Vo, Pop, and McMullin

Notes:
- 1 hour = 1 hour of face time
- The above outline allows for 3 hours review and exams
- 16 Week Term: 1 week = 2.8333 hours (face time)
- 6 Week Term: 1 week = 7.5 hours (face time)
- Keep in mind that most holidays affect MW or MWF classes, so this timeline – NOT the topical outline – may need adjustment