DSE 2157 COMPUTER SYSTEM ARCHITECTURE [3 0 0 3]

Number Representation and Arithmetic Operations, Character Representation, Memory locations and addresses, Memory operations, Addressing modes, CISC and RISC. Hardware for addition and subtraction, Multiplication, Hardware implementation, Booth's algorithm, Division, Floating point representation, IEEE standard floating point representation, Floating point arithmetic. Bus organization, comparison of hardwired and micro-programmed approach, hardwired control design, Booths multiplier design, Micro-programmed multiplier control unit. Internal organization of memory chips, Structure of Larger Memories, Cache mapping functions, Replacement algorithms, Virtual memories. Accessing I/O devices, Interrupts, Enabling and Disabling Interrupts, DMA. Pipeline Organization, Data Dependencies, Handling Data Dependencies, Hardware Multithreading, SIMD Processing, Graphics Processing Units (GPUs), Shared Memory Multiprocessors, Interconnection Networks, Cache Coherence, Write-Through Protocol, Write-Back protocol, Directory-Based Cache Coherence.

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