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## COMPUTER ORGANIZATION AND DESIGN

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**CTC 212      Computer Organization and Design****4.0 UNITS**

The operation of Flip-Flops as memory elements and counter analysis of Ripple/Synchronous mod counters are covered as building blocks for future design application. The major emphasis on counters is on the design of irregular and truncated counters using D and J-K Flip-Flops and integrated circuit applications of Up/Down counters and dividers. Also includes a coverage of timers, oscillators, and three-state operation. Registers are covered and include counting (Ring and Twisted Ring) shifting (Left/Right) and timing applications. The latter part of the course is devoted to arithmetic applications including 2's complement adders and subtractors with overflow and underflow detection, and BCD arithmetic and arithmetic/logic I.C. units. Computer instructions, timing and control, executions of instructions, and designs of a basic accumulator-based computer are also covered. The laboratory exercises are organized to support the above theory and to enable students to design, assemble, and test applications constructed with MSI/LSI chips.