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| **Course-29 Title: Digital Logic Design** |  |
| **Course No.: CCE 221 Credit : 3 Contact Hours: 3** | **Total Marks: 100** |

* 1. **Rationale:**

A computer engineer needs to know about number system, logic design and the basic building blocks used in digital systems, in particular digital computers.

* 1. **Objectives:**

1. To learn about basic concept on number system, universal gates and truth tables.
2. to know about Boolean function and De-Morgan, canonical forms and minimization techniques
3. to learn about combinational and sequential circuits and basic flip flops
4. to know about synchronous and asynchronous counters

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| **11.3**  **Learning Outcomes** | **11.4**  **Course Content** | **11.5**  **Teaching Strategy/ Learning Experience** | **11.6 Assessment Strategy** |
| 1. Explain number systems | Number systems and codes. | Lecture | Short Question |
| 1. Apply De-Morgan law for the Boolean function 2. State and explain De-Morgan | Digital logic: Boolean algebra, De-Morgan's law, Logic gates and their truth tables. | Lecture  Exercise | Spot Test  Short Question |
| 1. Evaluate canonical forms 2. Apply minimization techniques 3. Explain combinational logic circuits | Canonical forms, combinational logic circuits, minimization techniques. | Lecture  Exercise  Assignment | Spot Test  Quiz  Short Question  Assignment |
| 1. Determine decoder and encoder function 2. Differentiate MUX and DEMUX 3. Draw data handling logic circuit | Arithmetic and data handling logic circuit, decoders and encoders, Multiplexers and Demultiplexers. | Lecture  Exercise  Assignment | Spot Test  Quiz  Short Question |
| 1. Explain flip flops and race problems | Combinational Circuit design, Flip-flops, race around problems. | Lecture  Exercise  Assignment | Spot Test  Quiz  Short Question |
| 1. Design synchronous and asynchronous circuits | Counters: Asynchronous and Synchronous counters and their applications. | Lecture  Exercise  Assignment | Spot Test  Quiz  Short Question  Assignment |
| 1. Apply state diagram for logic circuits 2. State and explain Mealy and Moore machine | Synchronous and asynchronous logic design: state diagram, Mealy and Moore machine. | Lecture  Exercise  Assignment | Spot Test  Quiz  Short Question |
| 1. Explain state minimization and assignments 2. Demonstrate pulse mode logic and mode logic design | State minimization and assignments. Pulse mode logic, Fundamental mode logic design. | Lecture  Exercise  Assignment | Spot Test  Quiz  Short Question  Assignment |

**RECOMMENDED BOOKS AND PERIODICALS**

**Text Books**:

1. Digital logic and Computer Design. M. Morris Mano

2. Digital System Analysis. Tocci