

| | | |
|--|---|-----------------------|
| Program | BS Data Science | |
| Course Code | CC-110L | |
| Course Title | Digital Logic Design (Lab) | |
| Credit Hours | Theory | Lab |
| | 3 | 1 |
| Lecture Duration | 90 minutes (1.5 Hours), 2 lectures per week, 3 hours lab session per week | |
| Semester | 2 | |
| Pre-requisites | Courses | Knowledge |
| | | |
| Follow Up Courses | Computer Organization and Assembly Language | |
| Course Learning Outcomes (CLOs) | | |
| CLO No | Course Learning Outcome | Bloom Taxonomy |
| CLO-1 | Acquire knowledge related to the concepts, tools and - techniques for the design of digital electronic circuits | C2 (Understand) |
| CLO-2 | Demonstrate the skills to design and analyze both combinational and sequential circuits using a variety of techniques. | C2 (Understand) |
| CLO-3 | Apply the acquired knowledge to simulate and implement small-scale digital circuits | C3 (Apply) |
| CLO-4 | Understand the relationship between abstract logic characterizations and practical electrical implementations. | C2 (Understand) |
| Aims and Objectives | 1. Get the theoretical and the practical knowledge of the fundamental circuitry of the computers. | |
| Learning Outcomes: | Student will have knowledge of | |
| | <ul style="list-style-type: none"> • Number Systems and Boolean Algebra • Combinational Circuits • Sequential Circuits • Registers and Memory elements • Lab experience of ICS | |

| | |
|--|---|
| Syllabus | Number Systems, Logic Gates, Boolean Algebra, Combination logic circuits and designs, Simplification Methods (K-Map, Quinn Mc-Cluskey method), Flip Flops and Latches, Asynchronous and Synchronous circuits, Counters, Shift Registers, Counters, Triggered devices & its types. Binary Arithmetic and Arithmetic Circuits, Memory Elements, State Machines. Introduction Programmable Logic Devices (CPLD, FPGA) Lab Assignments using tools such as Verilog HDL/VHDL, MultiSim |
| Contents | <ol style="list-style-type: none"> 1. Number Systems, 2. Logic Gates, 3. Boolean Algebra, 4. Combination logic circuits and designs, 5. Simplification Methods (K-Map, Quinn Mc-Cluskey method), 6. Flip Flops and Latches, 7. Asynchronous and Synchronous circuits, 8. Counters, 9. Shift Registers, 10. Counters, Triggered devices & its types. 11. Binary Arithmetic and Arithmetic Circuits, 12. Memory Elements, 13. State Machines. 14. Introduction Programmable Logic Devices (CPLD, FPGA) Lab Assignments using tools such as Verilog HDL/VHDL, MultiSim |
| Teaching-learning Strategies | The students will be given all round knowledge of the subject oral/on white board/assignments/sudden quizzes during class rooms only. |
| Assignments | Assignments will be assigned throughout the course. |
| Textbooks | <ol style="list-style-type: none"> 1. Digital Fundamentals by Floyd, 11/e. 2. Fundamental of Digital Logic with Verilog Design, Stephen Brown, 2/e |
| Reference Material/Suggested Readings | All reference Material/readings will be provided during lectures as per the class performance and their interest in the degree program overall. |
| Notes | Students will take their own notes during class. |