Digital Electronics Laboratory

The Digital Electronics Laboratory serves as a fundamental component of the undergraduate curriculum in the Department of Electronics and Communication Engineering. It is designed to provide students with a comprehensive understanding of the principles and practical applications of digital circuit design. This lab plays a critical role in bridging the gap between theoretical learning and real-world implementation, allowing students to develop the technical competencies required for advanced study and industry readiness in the fields of digital systems, embedded systems, and VLSI design.

Within this lab, students explore the intricacies of both combinational and sequential logic **circuits** through hands-on experimentation. Beginning with basic logic gates, learners progress to designing and analyzing complex digital components such as multiplexers, demultiplexers, encoders, decoders, flip-flops, counters, shift registers, and finite state machines. These components are studied not only at the logic gate level but also in terms of how they interact within larger digital systems. The laboratory experience is enhanced through the use of digital trainer kits, discrete 74-series logic ICs, oscilloscopes, and logic analyzers, which allow students to construct and observe the behavior of digital circuits in real time. In addition to hardware experiments, students also engage with modern software simulation tools such as Logisim, Multisim, and Proteus to model and test circuit behavior in virtual environments.

A significant focus of the lab is the introduction to Hardware Description Languages (HDLs), particularly Verilog and VHDL. Through these languages, students learn how to describe digital circuits at the register-transfer level (RTL), simulate their performance using tools like Xilinx Vivado or ModelSim, and implement designs on FPGA development boards. This experience provides a foundation for understanding the design flow used in the digital hardware industry, from specification and simulation to synthesis and testing.

Furthermore, the Digital Electronics Lab aligns with DTU's broader efforts to provide industry-relevant education. Collaborations such as the Samsung Innovation Lab on campus give students access to emerging technologies and opportunities for research and product development in areas like consumer electronics, IoT, and embedded systems. Overall, the Digital Electronics Lab fosters a deep understanding of how digital systems function and are developed. It equips students with the practical skills to analyze, design, simulate, and implement digital hardware systems, making it a vital part of their engineering education and a strong foundation for future careers in the semiconductor and electronics industry.

Department of Electronics and Communication Engineering
DELHI TECHNOLOGICAL UNIVERSITY

DIGITAL ELECTRONICS LABORATORY

Lab Incharge	Prof. Neeta Pandey
Co- Lab Incharge	Dr. Deva Nand
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Lab Attendant	Mr. Mohan Kumar

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Lab In-Charge –

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DIGITAL ELECTRONICS LABORATORY
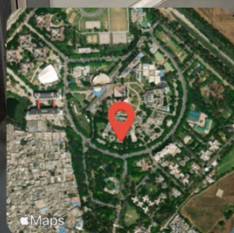
Department of Electronics & Communication Engineering

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