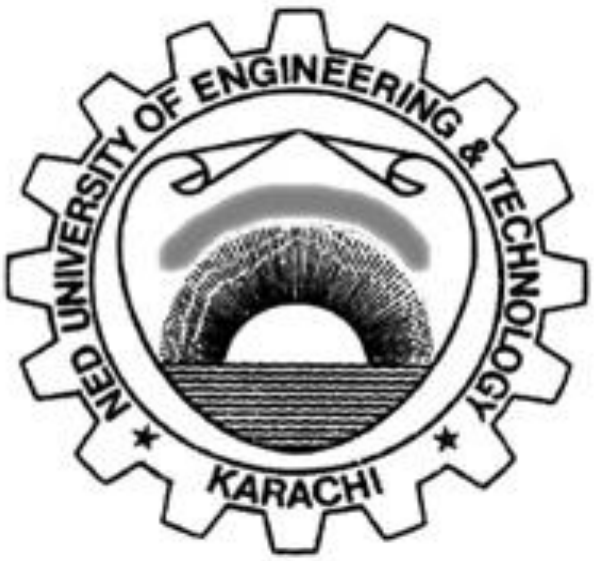
Practical Workbook
CS-220
Digital Logic Design



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Department: _____

Department of Computer & Information Systems Engineering
NED University of Engineering & Technology

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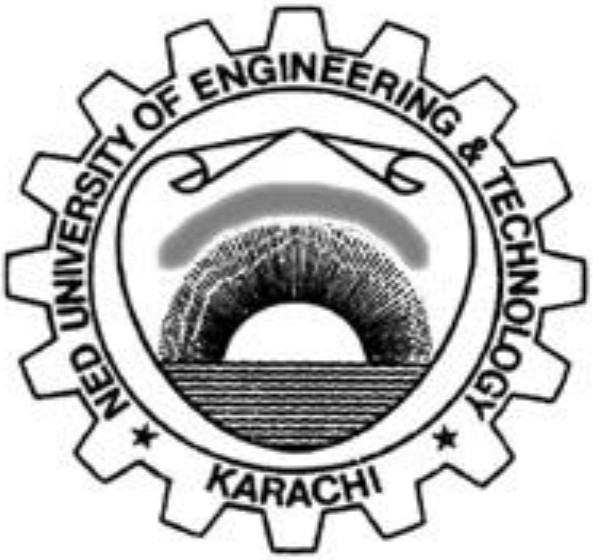

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INTRODUCTION

Digital Logic Design is the one of the fundamental courses taught in CIS Department. The digital logic design area covers the digital building blocks, tools, and techniques in the design of computers and other digital systems. It is one of the areas that differentiate computer engineers from electrical engineers and computer scientists. It covers a variety of basic topics, including switching theory, combinational and sequential logic circuits, and memory elements.

The course profile of CS-220 Digital Logic Design lays down the following Course Learning Outcome:

"Practice designing and testing digital logic circuit of MSI (medium scale integration) level (P3, PLO-3)"

All lab sessions of this workbook have been designed to assist the achievement of the above CLO. A rubric to evaluate student performance has been provided at the end of the workbook.

In this Practical Workbook, laboratory sessions based on both combinational and sequential logic are covered. The lab sessions fall into two categories:

1. Hardware implementation and IC testing. It covers combinational and sequential circuit building on a bread board or logic trainer board, and testing of various MSI ICs including registers and different types of counters.
2. Logic circuit simulation on CAD software – Electronics Workbench (EWB). EWB is excellent simulation software for beginners, where circuits can be designed and tested before physical implementation. Various laboratory sessions of this workbook provide activities and exercises on EWB.

All laboratory sessions of this workbook incorporate brief theoretical backgrounds, as details may be covered in the respective theory classes. Exercises / activities are included with all the sessions for the students to practice.

Three appendices are also included in this workbook. The first one provides pin diagrams for all the ICs required for the laboratory work provided in this workbook. It will help the students in preparing the pin diagrams for the circuits. Second appendix covers hardware equipment /components other than ICs that are commonly required in building circuits / mini projects. Third appendix discusses generation of square wave via 555 timer IC and a hardware debouncing circuit for mechanical switches as such switches are extensively used for input purpose in logic circuits.

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