Product Name : Digital logic trainer	**Product Code :** NLAB-ELECTRICALAB210002

Description :

Digital logic trainer

Technical Specification :

The Digital Trainer should be a modular course covering concepts, theory and applications for digital electronics training. It should be designed start the student with the basics of digital technology and goes onto advanced digital topics. All necessary equipment for digital trainer experiments such as multiple output power supply, clock generator, logic indicator, data switches, toggle switches, push buttons, pulsars and 7 segment displays should be installed on the base station. The base station should be able to work with modules required for experiments. A comprehensive operation manual and experiment manual are provided to be used together in doing the experiments. The digital trainer modules should have more 30 different types of ICs for student to explore.

Courseware:

The Digital Trainer should be included with operation manuals and experiment manuals which includes step-by-step chapters with theoretical

information and practical student experiments. Each chapter must
include student tests with an answer key.

The Digital Trainer should be able to conduct the following topics of experiments:

Technical Specifications:

a. Basic Digital Logic Training Module.

- Should be covered the following Topics of Experiment:

- Fundamental of AND, OR, INVERTER, NAND and NOR.

- Basis of AND, OR, INVERTER, NAND and NOR with ICs.

- XOR logic with ICs.

- Practical NAND and NOR gate circuits.

- Active high and active low inputs and outputs.

- Product of sums circuits.

- Sum of products circuits.

- Pulse distortion and propagation delay.

- Schmitt trigger gates.

- Parity circuit.

- Fundamentals of diode and BJT logic.

- Open collector TTL outputs.

- Three state outputs.

- D type latches.

- Introduction to JK flip-flop.

- Serial in shift register.

- Parallel in shift register.

- Fundamental of RS Lathes.

b. Advanced Digital Logic Training Module.

- Should be covered the following Topics of Experiment:

- Binary ripple counters.

- Modulus counters.

- Binary counter IC devices.

- Principle of synchronous binary counters.

- Programmable up/down binary counters.

- BI-directional and universal shift register.

- Decimal to binary decoders.

- Binary to decimal decoders

- Half adders and full adders

- Digital magnitude comparator circuit

- Multiplexer.

- Demultiplexer.

- Random Access Memory (RAM).

- Digital to Analog conversion.

- Analog to Digital conversion.

c. Modules:

The Digital Trainer should include
experimental board modules that closely follow the courseware. The
modules must be made of high quality epoxy coated fiber glass printed
circuit board with the electronic components mounted on the surface.
Each board should be printed with a clearly laid out silk screened
schematic circuit diagram showing circuit construction and operation.
The PCB modules must have all the components requested for the
experiments mounted on to them. The modules should encompass of digital
logic training modules and advanced digital logic training modules. The
base station should also be able to facilitate digital application
modules. Connections should be made by 2mm stackable test leads which
are provided together with the modules.

d. Student Base Station

Serves as the platform for carrying out the student experiments. Provide for all the primary needs of the experiment modules.

- **Fixed regulated DC power supplies :** +5V, +15V, -15V, variable 1.5 ~ 15VDC

- **Logic indicators :** 16 logic indicator

- **Data switches :** 16 (for TTL & CMOS)

- **Toggle switches :** 4 (SPDT)

- **Push buttons :** 3 (2NO, 1NC)

- **Pulsers :** 2 pulsers (A,A and B,B)

- **Seven segments :** 4 seven segment digital displays

- **Clock generator :** 1Hz â€" 100kHz

- **Test leads :** 1 set of stackable 2mm test leads