


A Novel Practical Approach for Teaching Electronics for UG & PG Hearing Impaired Students

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Teaching electronics with the practical approach for any UG & PG students need really a practical environment. It is further difficult for teaching Electronic subjects along with the hands on practical knowledge for UG & PG students of hearing impaired. A novel methodology has been proposed focusing towards teaching basic electronics to hearing impaired students of UG & PG level.

In this Approach, a User Interface has been designed where the faculty can able to present an interactive user environment that has several components to enhance the teaching and learning aspects with practical approach. The designed system has as a predefined systematic procedure for teaching various topics along with the hands on experience with the blend of theory, practical and exercises. Low cost hardware with PCB has been designed for each and every experiment to demonstrate without going to further any instrumentation and provided as an integrated environment to demonstrate and impart practical aspects of basic electronics.

Objective	Layer architecture of Basic Electronics Module & Its GUI
<ul style="list-style-type: none">❖ This System is designed to solve many problems by integrating experiments of each subject in an interactive way in real environment along with assistive videos, animations that are specially designed for hearing impaired students.❖ This System provides the complete solution in real environment by building useful projects and product designs by integrating the theory and practical's.❖ This System contains different experiments, modules, subjects that make them understand in easy and interactive way.	<div><div><div>Circuit Layer (Designed PCB for Experiment)</div><div>Middle Layer (Arduino use as Target board)</div><div>Application Layer (Smart GUI using master board)</div></div><div><div>Basic Electronics</div><div></div><div>Basic electronics comprises the minimal "electronics components" that make up a part of everyday electronics equipment. These electronic components include resistors, transistors, capacitors, diodes, inductors and transformers. Powered by a battery, they are designed to work under certain physics laws and principles</div><div><div>Basic Electronics Laws</div><div>Components of Electronics</div><div>Semiconductor Diode</div><div>Transistors</div><div>Switch, Relay & PCB</div><div>Transformers</div><div>Back</div></div></div></div>

Experiment covered by this Module	Working Procedure	Block Diagram
<ul style="list-style-type: none">▪ To find the value of Resistance, voltage, current, Power using Ohms Law.▪ To find the value of Resistance, voltage, and current using Kirchhoff's Current Laws.▪ To find the value of Resistance, voltage, and current using Kirchhoff's Voltage Laws.▪ To find the value of Resistance, voltage, and Power dissipation across Resistance R1, R2, R3, Req in Parallel.▪ To find the Value of Resistance, voltage, Power dissipation across Resistance R1, R2, R3, and Req in Series.▪ To calculate capacitance value, Charge, Energy and voltage.▪ To Study NPN as Switch and Amplifier.▪ To verify Zener Breakdown voltage.▪ To verify the graph of Half wave rectifier.▪ To verify the graph of Centre-Tap rectifier.▪ To verify the graph of Full Bridge wave rectifier	<div><div><div>Start SEK-UI</div><div>Select the subject</div><div>Select Experiment Module</div><div>Select Lab</div><div>Connect the target board to host system</div><div>Cross check all connection</div><div>Run the experiment using UI</div><div>Note down all Parameter</div></div><div><div>Basic Computer</div><div>Basic Electronic</div><div>Programming language</div><div>Computer Network</div><div>Microcontroller</div><div>Cloud computing</div></div><div><div>Basic electronics law</div><div>Component of electronics</div><div>Semiconductor diode</div><div>Transistor</div><div>Switch relay & PCB</div><div>Transformers</div></div></div>	<div><div><div>Target Extension Board</div><div>Target Board</div><div>Host Board</div><div>Graphical User Interface</div></div><div>USB to UART</div></div>

Framework Features	Target Audience
<ul style="list-style-type: none">❖ Smart UI with all information about basic electronics & Its Hands on Practicals.❖ Practical environment for on board interfacing various components, solve the issue of instructor presentation and provides a participatory teaching learning environment.❖ A Practical interactive environment that helps to learn new technology with on board interfacing facilities by solving real world problems.	<ul style="list-style-type: none">❖ Students: Who are hearing impaired & pursuing technical education❖ Faculties: Who are teaching technical courses to hearing impaired students and others❖ Students & Faculties of mainstream classrooms at school as well as college level

Collaborators	
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