**Capital University of Science & Technology**

Department of Electrical and Computer Engineering

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| **Project Title** | | **12v Variable Power Supply** | |
| **Course Title** | | **Workshop Practice – CPEG 1021** | |
| **S#** | **Student Name** | | **Registration Number** |
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**Project Idea**

**12v Variable Power Supply**

**Project Objectives**

**Adjustable Output Voltage:** Provides a variable voltage range from 0V to 12V, allowing precise adjustments to meet different application requirements.

**Adjustment Knob:** Provides precise voltage tuning through a single control mechanism, allowing the user to easily adjust the output voltage within the 0V to 12V range.

**Overload Protection:** Includes built-in overload, overcurrent, and short-circuit protection mechanisms to ensure the safety of connected devices and the power supply unit.

**Power Indicator:** Incorporates an LED indicator to signal the power-on status of the device.

**Durable Build:** Enclosed in a robust casing to protect against physical damage and ensure long-term reliability.

**Universal Input Voltage:** Supports a wide input voltage range (e.g., 100-240V AC) for compatibility with various power sources.

**Ease of Use**: Plug-and-play functionality with intuitive controls, suitable for beginners and professionals alike.

**Applications**

**Electronics Testing and Prototyping:** Used by electronics enthusiasts and engineers to test, troubleshoot, and prototype circuits and devices.

**Educational Labs:** Ideal for students and educators in electronics and physics labs for practical demonstrations and experiments.

**Repair Workshops:** Useful in servicing and repairing electronic devices requiring adjustable power input.

**DIY Projects:** Provides flexible power options for hobbyists working on small-scale electronic projects.

**Battery Charging:** Can be used to charge low-capacity batteries by setting specific voltage levels.

**LED and Motor Testing:** Suitable for testing components such as LEDs, small DC motors, and sensors requiring specific voltage.

**Home Automation Projects:** Powers low-voltage home automation devices and systems.

**Embedded Systems Development:** Serves as a power source for microcontroller and embedded system boards like Arduino and Raspberry Pi.

**Block Diagram**

