Introduction

In laboratory and experimental work, the source of energy electric is very important. Most products in electronics require using the current and voltage source. I propose to develop a programmable power supply as my senior project. The requirement I propose for this project is that the programmable power supply will provide the user an output voltage from one to fifteen volts at a current level up to 1 amp.

Description

For the user interface, the power supply will consist of a switch to turn the power ON or OFF; a green or red LED to monitor the power is ON or OFF, a keypad for the user to enter the desired voltage. An LCD display will show the correct information entered from the keypad, and the output terminal.

The figure below represents the programmable power supply.

Figure 1: Sketch of Programmable Power Supply (PPS)

The programmable power supply will receive an alternate current source of 120 volts, and the step-down transformer will reduce it to 15 volts and the microcontroller will control the output as the user desires.
**Block Diagram**

As this project will require having an embedded system, I propose to use a MC9S12 as microcontroller, and this is the overall view of the programmable power supply.

![Block Diagram of PPS](image)

**Figure 2: Block Diagram of PPS**

**Function**

The programmable power supply will provide to the user the possibility to run any electronic product that needs low voltage and current. I have some components available at the electronic lab, for example a 120V-60Hz step-down voltage transformer. I have some rectifier component that I used on my previous instrumentation class. The case that I use for my sketch is also available at the electronic lab. I will order other components that I will need from the different electronics products provider (National, Freescale).

There are many tools available here at the lab such as solder iron, screw drivers and measurement equipments that I will use during the developing process of the project. When the programmable power supply will be built, I will use it as source to power a different electronics product such as electronics keyboard, a small electric motor.

The programmable power supply that I propose to build will have few features for the user interface; therefore it makes the product easy to be familiar with.
If you compare it with other small power supply, which has many features for the user interface, it makes the product difficult to use. So the cost will be less also.

For the reason of safety with the applications of the programmable power supply, I propose to use the current limiting source instead of fixed current. It will be safe to use it with any electronics products requiring low currents and voltage.