

EE100B  
Experiment 5

**The Design of Waveform Generators**

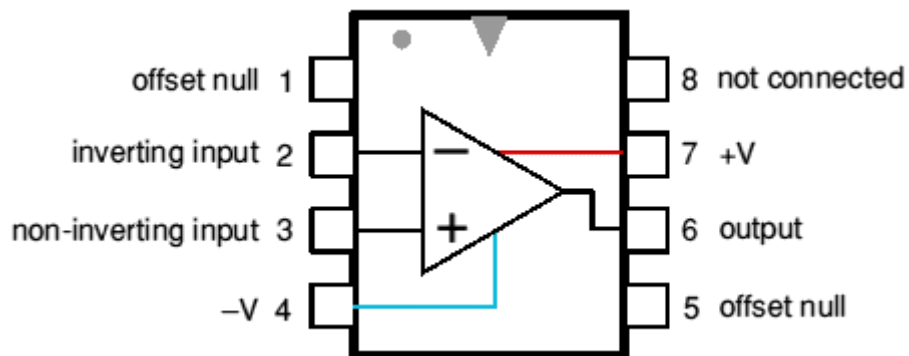
College of Engineering  
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**Objective**

To design and implement a sine wave oscillator and a square wave oscillator using the knowledge you learned from class.

**Equipment**

Op-amp (741), a variety of resistors and capacitors, function generator, oscilloscope, digital multimeter, DC power supply, breadboard



**Figure L5.1** 741 Op-Amp Pin Connections

**Prelab**

Read the sections of your textbook relevant to this laboratory session.

1. Design a sine wave oscillator using the op-amp that provides the output signal with amplitude of 4V to 6.5V and a frequency of 1 kHz.
2. Design a square wave oscillator using the op-amp that provides the output signal with amplitude of 4V to 6.5V and a frequency of 1 kHz.

## Laboratory Procedure

### Sine wave oscillator

Assemble the circuit as per your design in the prelab. Measure the amplitude of the output signal achieved by the actual circuit. Measure the frequency of the output signal. If the design requirements are not satisfied, adjust the circuit parameters accordingly. Adjust the circuit parameters to make the performance as good as possible. State any differences or modifications between the original design and the one assembled on your breadboard. Compare the theoretical results to those obtained experimentally (by calculating the percentage of error).

### Square wave oscillator

Assemble the circuit as per your design in the prelab. Measure the amplitude of the output signal achieved by the actual circuit. Measure the frequency of the output signal. If the design requirements are not satisfied, adjust the circuit parameters accordingly. Adjust the circuit parameters to make the performance as good as possible. State any differences or modifications between the original design and the one assembled on your breadboard. Compare the theoretical results to those obtained experimentally (by calculating the percentage of error).