

# Components required per group for each laboratory

## ECE 209: *Circuits and Electronics Laboratory*

### Abstract

This document lists the components required for the smooth execution of every laboratory in the class. Students are *not* required to purchase these components; they are stocked within the laboratory.

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## Per-group required-component lists grouped by laboratory

### Lab 1: Introduction to the Digital Oscilloscope and Function Generator

Quantity	Component
1	Phase-shift generator (custom circuit assembled on printed/perforated circuit board)

### Lab 2: Meters, Measurements, and Errors

Quantity	Component
1	15 k $\Omega$ (code: <del>brown</del> <del>green</del> <del>orange</del> or 153) resistor
2	1 M $\Omega$ (code: <del>brown</del> <del>black</del> <del>green</del> or 105) resistor
1	500 $\Omega$ (code: 501) potentiometer
1	<a href="#">HP 972A</a> 20 kHz digital multimeter (at lab bench) — ammeter must be functional
1	<a href="#">HP 974A</a> 100 kHz digital multimeter (at lab bench) — ammeter must be functional

### Lab 3: Introduction to Operational Amplifiers; Step and Freq. Resp. of F.O. Circuits

Quantity	Component
1	10 nF (code: 103, 10n, or 0.010MF) capacitor
2	1 k $\Omega$ (code: <del>brown</del> <del>black</del> <del>red</del> or 102) resistor
1	10 k $\Omega$ (code: <del>brown</del> <del>black</del> <del>orange</del> or 103) resistor
1	47 k $\Omega$ (code: <del>yellow</del> <del>violet</del> <del>orange</del> or 473) resistor
1	<a href="#">LM741</a> (or half of an <a href="#">LM747</a> ) operational amplifier

### Lab 4: Freq. Resp. of F.O. Active Circuits

Quantity	Component
1	200 pF (code: 201, 200, or 200p) capacitor
1	33 k $\Omega$ (code: <del>orange</del> <del>orange</del> <del>orange</del> or 333) resistor
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Quantity	Component
1	100 k $\Omega$ (code: <b>brown-black-yellow</b> or 104) resistor
1	LM741 (or half of an LM747) operational amplifier

#### Lab 5: Properties of S.O. Circuits

Quantity	Component
1	10 nF (code: 103, 10n, or 0.010MF) capacitor
1	20 nF (code: 203, 20n, or 0.020MF) capacitor
1	68 nF (code: 683, 68n, or 0.068MF) capacitor
2	100 nF (code: 104, 100n, or 0.10MF) capacitor
1	560 $\Omega$ (code: <b>green-blue-brown</b> or 561) resistor
2	10 k $\Omega$ (code: <b>brown-black-orange</b> or 103) resistor
1	18 k $\Omega$ (code: <b>brown-gray-orange</b> or 183) resistor
1	LM741 (or half of an LM747) operational amplifier
1	Adjustable inductance box

#### Lab 6: Nonlinear Circuits: Diode and Transistor Switch

Quantity	Component
1	1 k $\Omega$ (code: <b>brown-black-red</b> or 102) resistor
1	10 k $\Omega$ (code: <b>brown-black-orange</b> or 103) resistor
1	2N2222 (or 2N3904) NPN BJT
2	1N914 generic small-signal silicon diode (alternates: 1N914A, 1N914B, or 1N4148)

#### Lab 7: Digital-to-Analog (D/A) Application

Quantity	Component
1	1 k $\Omega$ (code: <b>brown-black-red</b> or 102) resistor
15	10 k $\Omega$ (code: <b>brown-black-orange</b> or 103) resistor
1	LM741 (or half of an LM747) operational amplifier

## Complete list of components required per group

! Because parts are replaced at the end of each class, the laboratory must have a stock !  
! of enough components for **one large section** of the class (e.g., 10 groups). !

### Total components required for a single lab group

Quantity	Component
1	200 pF (code: 201, 200, or 200p) capacitor
1	10 nF (code: 103, 10n, or 0.010MF) capacitor
1	20 nF (code: 203, 20n, or 0.020MF) capacitor
1	68 nF (code: 683, 68n, or 0.068MF) capacitor
2	100 nF (code: 104, 100n, or 0.10MF) capacitor
1	560 $\Omega$ (code: <span style="background-color: #90EE90;">green</span> <span style="background-color: #6495ED;">blue</span> <span style="background-color: #A52A2A;">brown</span> or 561) resistor
2	1 k $\Omega$ (code: <span style="background-color: #A52A2A;">brown</span> <span style="background-color: #000000;">black</span> <span style="background-color: #DC143C;">red</span> or 102) resistor
17	10 k $\Omega$ (code: <span style="background-color: #A52A2A;">brown</span> <span style="background-color: #000000;">black</span> <span style="background-color: #FF8C00;">orange</span> or 103) resistor
1	15 k $\Omega$ (code: <span style="background-color: #A52A2A;">brown</span> <span style="background-color: #90EE90;">green</span> <span style="background-color: #FF8C00;">orange</span> or 153) resistor
1	18 k $\Omega$ (code: <span style="background-color: #A52A2A;">brown</span> <span style="background-color: #808080;">gray</span> <span style="background-color: #FF8C00;">orange</span> or 183) resistor
1	33 k $\Omega$ (code: <span style="background-color: #FF8C00;">orange</span> <span style="background-color: #FF8C00;">orange</span> <span style="background-color: #FF8C00;">orange</span> or 333) resistor
1	47 k $\Omega$ (code: <span style="background-color: #FFFF00;">yellow</span> <span style="background-color: #8A2BE2;">violet</span> <span style="background-color: #FF8C00;">orange</span> or 473) resistor
1	100 k $\Omega$ (code: <span style="background-color: #A52A2A;">brown</span> <span style="background-color: #000000;">black</span> <span style="background-color: #FFFF00;">yellow</span> or 104) resistor
2	1 M $\Omega$ (code: <span style="background-color: #A52A2A;">brown</span> <span style="background-color: #000000;">black</span> <span style="background-color: #90EE90;">green</span> or 105) resistor
1	500 $\Omega$ (code: 501) potentiometer
1	<a href="#">2N2222</a> (or <a href="#">2N3904</a> ) NPN BJT
2	<a href="#">1N914</a> generic small-signal silicon diode (alternates: <a href="#">1N914A</a> , <a href="#">1N914B</a> , or <a href="#">1N4148</a> )
2	<a href="#">LM741</a> (or half of an <a href="#">LM747</a> ) operational amplifier
1	Phase-shift generator (custom circuit assembled on printed/perforated circuit board)
1	<a href="#">HP 972A</a> 20 kHz digital multimeter (at lab bench) — ammeter must be functional
1	<a href="#">HP 974A</a> 100 kHz digital multimeter (at lab bench) — ammeter must be functional
1	Adjustable inductance box