# Lab 3 Checklist

**Name:**_____

**Lab title and introduction**

- Lab title, your name, date, and lab partner.
- Brief introduction (one to three sentences) explaining the purpose of this lab.

**I. First Order High Pass Active Filter (50 pts total)**

1. Differential equation relating $v_{out}$ and $v_{in}$ for circuit of Figure 1.
2. Selected values for $R_1$, $R_2$, and C to meet design specifications.
3. PSPICE simulation of circuit's frequency response.
4. PSPICE simulation of circuit's step response.
5. Measured values for $R_1$, $R_2$, and C used in circuit implementation.
6. **DEMO**: Have a teaching assistant initial this sheet, indicating that they have observed your circuit's operation.
   _____
   - Circuit sinusoidal operation is observed for at least one value of input frequency
   - Circuit design parameters $R_1$, $R_2$, and C are appropriate (show TA analysis from pre-lab providing design approach).
   - Discuss with TA whether circuit's frequency response is consistent with expectations from pre-lab analysis and PSPICE simulations.
   - Discuss with TA whether circuit's step response is consistent with expectations from pre-lab analysis and PSPICE simulations.
7. Plot your experimental frequency response data in your lab report using Microsoft Excel. Also provide either a sketch or a picture of your step response. Compare your experimental data and simulation results and discuss any discrepancies. Does your circuit's response meet the design specifications?

**II. High Gain Amplifier (50 pts total)**

(a) Circuit Design (20 pts total)

1. Sketch of amplifier circuit. Include desired values for circuit components (e.g. resistor values).
2. Expected gain, input and output resistances for your overall amplifier circuit, and for each stage within your amplifier circuit. (Hand calculations using information in Module 3.3).

(b) Circuit Implementation and testing (30 pts total)

1. Measured values of circuit components used in your design.
2. Measured values of the circuit's gain, input resistance, and output resistance. Does the circuit meet specifications?
3. **DEMO**: Have a TA initial this sheet, indicating that he/she has observed (i) your circuits' operation; (ii) your measurements verifying that the circuit meets the design specifications, and (iii) your calculations of gain and input and output resistance for the overall circuit and for each stage within the circuit.
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4. Comparison of measured and expected gain, input and output resistances for your circuit and discussion of any discrepancies between measurements and expectations.

 