

Lab 4 Grading Standard:

- 1) *In grading, do not explicitly assign points to the various sections. Rather, take points off for incorrect, incomplete or missing items.*
- 2) *When you take point off, be sure to write a short comment as to why the points were lost.*
- 3) *Example: (-1) What is the measured value of the component?
(-3) What is the mathematical formula that you are plotting on top of your data?*

General Notes:

- The axis of all plots must be labeled. This should include the quantity, the units and numerical values.
- The boxed questions should be answered in the lab book.
- Procedures must have a circuit diagram.
- Measured values of components used should be recorded in the lab book.
- Relevant formulas should be included in the lab book.
- Formulas for computed quantities in tables should be near the table in the book.

Failure to measure a component value when possible (max -1 per occurrence)

Missing units on components, plot axes, tables ... (-1 per occurrence).

Missing plot (-4 per occurrence).

Missing axes labels on plots (-1 per label).

Missing column labels on tables (-1 per label).

Missing formula for computed quantity in table (-1 per table)

Missing important formulas (-2 per occurrence)

No fit to linear curves (-2 per occurrence).

No fit values with units (-2 per occurrence).

No comparison of fit values with expectations when possible (-2 per occurrence).

Missing theoretical calculations when expected (-3 per occurrence).

Failure to answer questions (-2 per question, maximum of -10)

In this lab, the theoretical curves should agree extremely well with their measured data. These curves must be overlaid on the measured Bode and phase plots! They were warned many times that this needs to be present, so be severe if they neglected to do it.

Some of the students might have found a small rise in the very high-frequency gain of their RC circuits. This is due to some stray inductances in their circuit producing a resonance in the several 100 kHz region. If they saw this and then mapped it out and made some comment about it, give some sort of bonus in points. If they saw some hint of this, but ignored it, take off some points.

Pre-lab Signature:	10
Purpose/Introduction	5
There should be a two to five line description of what they are going to do in this lab. This is all or nothing for five points.	
RC Voltage Divider:	
Procedure:	5
There should be a several line procedure that shows the circuit, indicates where they are going to measure voltages, what the measured values of the components are.	
Data:	10
They should have tables of collected data and then Bode and Phase plots for the RC circuit.	
Analysis:	10
There needs to be a comparison of theory and experiment. <u>They should have the formulas that describe the gain and phase as a function of frequency and they should overlay these on their data.</u> They should comment on how well things agree or disagree. In principle, there should be excellent agreement.	
RL Voltage Divider:	
Procedure:	5
The procedure should include circuit diagrams, measured values of components and a description of what they are going to do.	
Data:	5
Same as above.	
Analysis:	5
Same as above. Some may see the resonant behavior at high frequency. If they see this, they need to comment on it. <u>Relevant formulas need to be in the lab book.</u>	
RLC Circuit: Same breakout as in RL	15
Band-Pass Filter: 15 points total	
Procedure	5
The procedure should include circuit diagrams, measured values of components and a description of what they are going to do.	
Data	5
Same as above.	
Analysis	5
Same as above. Relevant formulas need to be in the lab book.	
Questions:	10
Conclusion/Summary	5