Physics II
Lab 5 – Experimental Determination of an Unknown Capacitance [1]

NAME:

SECTION:

PURPOSE: In this experiment, you will determine an unknown capacitance by examining the drop in potential across the capacitor as it discharges through the internal resistance of a voltmeter.

PROCEDURE:

1. Use a voltmeter as a resistor. Discharge a capacitor thorough the voltmeter. Measure the time it takes to discharge to 80%, 60%, ... of the initial voltage.

2. Do the above ten times.

3. Average as indicated in the table, and find the corresponding standard deviations σ.

$V(t)/V_0$	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9	t_{10}	$\bar{t}$	σ
0.8												
0.6												
0.4												
0.2												

4. Plot $[-\ln(V/V_0)]$ as the ordinate and $\bar{t}$ as the abscissa. Use σ as the error bars.

5. Draw a straight line, and from the slope deduce the value of C. The value of R will be given to you by the instructor.

6. Turn in

   - This sheet of instructions (write your name and section number on it).
   - Your table.
   - Your graph.
   - Your calculation, and final value of C.

[1] Important: Read this in its entirety before doing the lab.