Prof. Mack Grady, Rogers 301, Mack_Grady@baylor.edu, 710-3307. Office Hours MWF 3-4pm. 
The course will be very similar to last Spring’s course. Check out the website 
https://web.ecs.baylor.edu/faculty/grady/. The lectures are public on BU public media space 
https://mediaspace.baylor.edu/channels

Prerequisites. Completion of EGR 1302 with a grade of B or better. MTH 1322, and credit or concurrent 
enrollment in PHY 1430.

Topics: Linear circuit elements, sources, Kirchhoff’s laws, mesh and node equations, Thevenin and Norton 
equivalent circuits, resistive network analysis, sinusoidal steady-state analysis, power, transient analysis of 
simple circuits. Chapters 1 – 5, 7 – 8, 10 – 12 in Wylie’s Electrical Circuit Analysis (Baylor) by Dorf and 
Svoboda.

Tests. Six 30 minute tests, no book, but you are allowed one sheet of notes (both sides). Work paper is 
provided for the test. Typically held on Fridays of every two-to-three weeks. To discourage copying, each 
test has several slightly different versions of the same problem(s). Be prepared to work mostly problems 
with no numbers. Your overall test grade will be based upon your best five tests.

Homework. Problems assigned every class period, and due two classes later (e.g., homework assigned on 
Monday will be due on Friday). Staple your homework sheets together, and do not fold. Neatness counts 
since the TA and I will grade them. You are encouraged to work together on homework, but remember that 
on tests, the work must be all yours.

Notebook. You will be provided with a professional notebook for taking class notes, to tape-in handouts, 
show in-class examples, and to tape-in homework AFTER it has been graded and returned to you. The 
notebook should show me what you have learned. You will leave them with me on test days, so I can grade 
them before the next class.

Final Exam. Comprehensive. You are allowed one sheet of notes, front and back.

Grading. 60% Tests, 10% Homework, 10% Notebook, 20% Final Exam. Typically the top third get A’s, middle 
third get B’s, some bottom thirds get C’s or lower.

Other Items. I plan to video-record all lectures for BU’s public https://mediaspace.baylor.edu/channels. 
Be prepared to answer questions in class about HW problems. When needed, we can have evening TEAMS 
meetings to work on homework problems together. Regular attendance is important and affects your 
grade. All Baylor policies will be followed.
**Battery, Ohms Law**

- **Battery**: Strong, large \( R_{TH} \)
- **Weak Battery**: Larger \( R_{TH} \)

\( V_{TH} \) decreases. 

Use units to check answers.

**Voltage, Amps, Resistance, Ohms Law**

- \( V = IR \)
- \( I = \frac{V}{R} \)

**Power, Watts, Joules, Energy**

- \( P = VW \)
- \( J = W \cdot sec \)
- \( 12.5 \) \( V \) \( 10^A \) \( 1250 W \)
- \( V_{MAX} \)
- \( V_{MIN} \)

**KVL**

- \( 0(V) \)
- \( V_{AC} \)
- \( AC \) from rotating machine

**DC + Sinusoidal**

- \( V(t) \)
- Technically \( DC \)

**1 Joule = (1 W)(1 s)**

- \( 1 \) \( J = 1000 \) \( W \cdot sec \) = Teaspoon of Gravel

- \( 1 \) \( kWH = 1000 \) \( J \)
- \( 1 \) \( kWHr = (1000) \cdot \left( 3600 \frac{sec}{hr} \right) \)

- \( 12 \) \( J = 3,600,000 \) \( J \cdot C \)
- \( 3 \) \( MJ \)

**Lightning**

- 50KA
- \( e^{-t} \) Variation
- 2 \( \mu s \)
- \( E_{peak} = 2000 \) \( V \cdot \mu s \)

**Battery V, I, J Graphs**

**KCL**

- \( I_A + I_B + I_C = 0 \)
- Pump 3\( W \)
- \( I_A \) to \( I_A + I_B + I_C = 0 \)
- \( I_C \)
MN1300
Size: D (LR20)
Alkaline-Manganese Dioxide Battery

Coppertop D Constant Power

- 250 mA
- 500 mA

Service Hours

Coppertop D Constant Power

- 1000 mA

Service Hours

Coppertop D Constant Resistance

- 2.2 Ohm
- 3.5 Ohm
- 5.1 Ohm
- 10 Ohm

Service Hours

Coppertop D Constant Temperature at 250 mA

- 0°C
- 21°C/70°F

Service Hours