Mastery Test Part 1 Preview

Review Session for
"Basic Electricity"
A Fairfield University E-Course
Powered by LearnLinc

Basic Electricity

Two Sections

- Electron Flow and Resistance
  - 5 on-line sessions
  - Lab
- Inductance and Capacitance
  - 5 on-line sessions
  - Lab

Mastery Test, Part 1

Basic Electricity (Continued)

- Text: "Electricity One-Seven," Harry Mileaf, Prentice-Hall, 1996, ISBN 0-13-889585-6 (Covers several Modules and more)
- References:
  - "Digital Mini Test: Principles of Electricity Lessons One and Two," SNET Home Study Coordinator, (203) 771-5400
  - Electronics Tutorial (Thanks to Alex Pounds)
  - Electronics Tutorial (Thanks to Mark Sokos)
  - Basic Math Tutorial (Thanks to George Mason University)
  - Vector Math Tutorial (Thanks to California Polytec at atom.physics.calpoly.edu)

Section 1:
Electron Flow and Resistance

- 0BJECTIVES: This section introduces five basic electrical concepts as well as the underlying atomic structure of electrical materials.
  - Conductance(G),
  - Resistance (R),
  - Current (I),
  - Power (P), and
  - Electromotive force (E) or voltage (V).

Section 2:
AC, Inductors and Capacitors

- 0BJECTIVES: This section introduces AC voltage / current and additional circuit components (inductors, transformers and capacitors).

Section 1 Schedule:

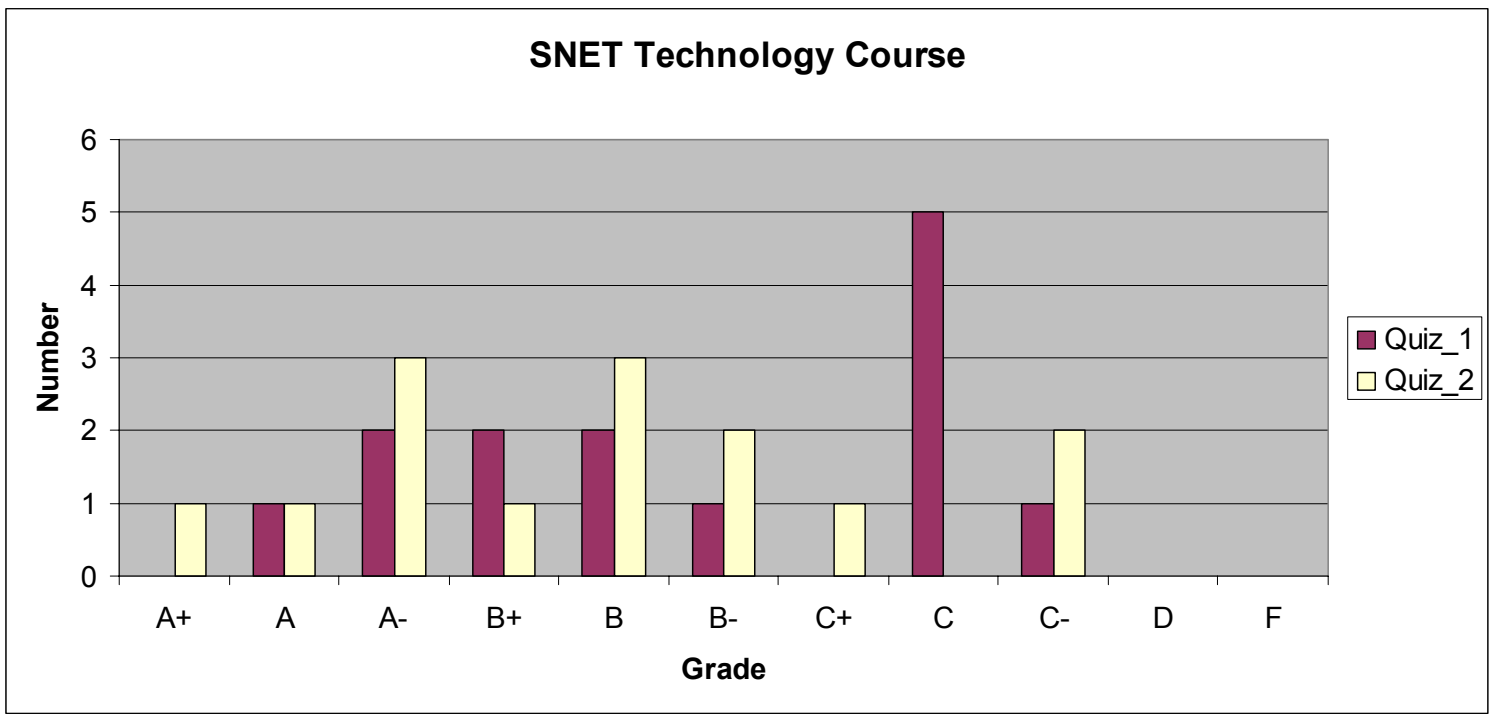
Session a – 03/04 *03/06 & 03/08 were Math Tutorials*	Atoms, Charge and Current	Text 1.1 – 1.39
	Conductivity (G), Electric Fields and Electromotive Force (EMF)	Text 1.40 – 1.68
Session b – 03/11	Resistance (R), Conductance (G), Ohms Law (Ω) & Power (Watts)	Text 2.1 – 2.52
Session c – 03/13 (lab - 03/16, sat.)	Resistors in Series and Parallel and Working with Equations	Text 2.53 – 2.98
Session d – 03/18	Series / Parallel Simplification Voltage and Current Dividers	2.99 – 2.115
Session e – 03/20	Kirchoff, Thevenin & Norton	2.116 – 2.133
Session f – 03/25	**Review (Discuss Quiz_1)**	**1.42, 1.63, 2.5, 2.129 Sokos**

Section 2 Schedule:

Session 2a – 03/27	AC & Sine Waves	Text 3.1 – 3.41
Vector Math – 04/01	Sine Waves, Magnitude, Phase and Vectors	Text 4.1 – 4.24
Session 2b – 04/03 (Fri. Q&A session)	Inductors and Circuits	Text 3.42 – 3.73
Session 2c – 04/08	Transformers	Text 3.74 – 3.100
Session 2d – 04/10 (lab - 04/13, Sat.)	Capacitors	Text 3.101 – 3.135
Session 2e – 04/15 Quiz 2 (due 04/22)	More Capacitors	Text 3.135 – 3.148
Session 2f – 04/22	Review (Discuss Quiz 2)	Text Chapter 2
Fri. Q&A – 04/26	**Review: Mastery Test Part 1**	**Text Chap. 2 and 3**
Sat. – 04/27	**Mastery Test Part 1**	

Quiz Results to Date

- The class had a B- and B average – Nice Job.
- Most of you should find the Mastery Test Part 1 easy.
- 2 or 3 of you need to correct minor deficiencies.



Topics for Mastery Test

1. Schematic symbols (R, C, L, T, sources, switches and Ground)
2. Definitions
3. Formulas and how to use them
   a. Ohm's law
   b. Power in resistors
   c. Kirchoff's Laws (voltages around a loop, currents at a node)
4. Parallel and serial combination of components
   a. Components are in parallel when they have both terminals in common
   b. Components are in series when the same current goes through both.

Topics
continued

5. Component specifications and their meanings
   a. Value: color codes
   b. Powers of ten:
      milli (-3), micro (-6), nano (-9), pico (-12),
      killo (3), mega (6) and giga (9)
   c. Tolerance
   d. Power rating (resistors)
   e. Voltage rating (capacitors, polarized)
   f. Current ratings (inductors, transformers, wire gauge and switch contacts)

Topics
continued

6. Digital Multi-Meter / Volt-Ohm-Meter capability and use
7. Use of batteries
8. Conductors and Insulators
9. Short and open circuits
10. **No AC, Thevenin, or Norton**

Mastery Test

- Tomorrow – Saturday, 27 April 2002
- Bannow Science Center
  - Classroom near Physics lab
- 9 to 11 am – be on time
- 50 multiple choice questions
- Makeup session - Tuesday, 30 April 2002
  - McAuliffee Hall 2nd floor at 6 pm sharp
    - Stone mansion on North Benson Road
    - Main university entrance, take first right and park
- Good luck

Module: Basic Electronics (AC Circuits and Impedance: two parts)

- Text: "Electricity One-Seven," Harry Mileaf, Prentice-Hall, 1996, ISBN 0-13-889585-6 (Covers much more material than this section)
- References:
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  - Electronics Tutorial (Thanks to Alex Pounds)
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  - Basic Math Tutorial (Thanks to George Mason University)
  - Vector Math Tutorial (Thanks to California Polytec at atom.physics.calpoly.edu)
- Alternating Current and Impedance
  - 5 on-line sessions plus one lab
- Resonance and Filters
  - 5 on-line sessions plus one lab

Module 2, Section 1

Alternating Current and Impedance

- 0BJECTIVES: This section applies AC voltage / current in circuits with resistors, inductors, capacitors and transformers. The concept of impedance as an extension of resistance (we now have a magnitude and phase) is introduced using a vector analogy.

Section 3 Schedule:

(Preliminary)

Mastery Test – 05/03	Results and Discussion	
Session 3a – 05/06	Sine Waves, Magnitude, Phase and Vectors (again)	Text 4.1 – 4.24
Session 3b – 05/08	R-L Circuits	Text 4.25 – 4.54
Session 3c – 05/13	R-C Circuits	Text 4.55 – 4.76
Session 3d – 05/15 (lab - 05/18, Sat.)	Series LC Circuits	Text 4.77 – 4.88
Session 3e – 05/20 Quiz 3 (due 05/26)	Parallel LC Circuits	Text 4.114 – 4.122
Session 3f – 05/27	Review (Discuss Quiz 3)	