Topics for Today:

- URL: http://www.ece.mtu.edu/faculty/bamork/EE5223/index.htm
- EE5223: 45 on-campus students; 9 online students
  20 BSEE students; 36 MSEE students
- Labs - EE5224 - Plan to begin in Week 3 (Tues 10am Jan 22nd)*
- Bus Configurations (Ch.10, sect 10.1 - 10.10)
  - Single Bus, Single Bus w/tie
  - Main & Transfer
  - Ring Bus
  - Breaker-and-a-half
  - Breaker-and-a-third
- Software - Aspen “OneLiner”(installed on software server)
- Zones of protection - let’s look at Assignment #1
- Zones of protection - generators, motors as fault source.
- Reading Relaying One-Lines (examples posted in Week 1)
EE5224 Lab - 33 registered so far!

Labs begin Tues Jan 29th.

Open lab seats:
• Tues 10-noon
• Wed 10-noon
• Wed 4-6pm
• Thurs 4-6pm
Bus Configurations

- Flexibility
  - Maintenance
  - Operation
- Reliability, if something fails
  - "Backup" Strategies
Next: Bus Configs - Sects. 10.1 - 10.10.

- Single Bus
- Double Bus
- Ring Bus
- "Breaker-and-a-half"
- "...third"
Single Breaker, Single Bus

Ch. 10 - Tables 10.1 & 10.2

- Line to another Sub
- Radial Load
- Gen
Radial System
- Backfeed thru sect. Sw.
in interim for maintenance.
Single Bus w/ Bus Tie Breaker 69-kV
Main & Transfer - Fig. 10.3
Double-Bus Double Breaker
Ring Bus - One CB per circuit
Breaker-and-a-half

Bay

Bus 1

Bus 2

1.5 CBS/Line

Breaker-and-a-third: 4 CBS/Bay
Zones of Protection
a) Circle the zones of protection for the following power system.

b) State which CB's Trip for a fault at:
   1) L1
   2) Bus III
   3) G2
   4) T4
   5) Bus II
   6) Load
   7) M1

c) For a fault on bus I and CB3 fails which CB opens as backup?

d) Does CB2 need to operate for a bus I fault?

e) For a fault on L4 which CB's back up CB11?

f) For a fault on L2 which CB's back up CB4?

g) CB6 & 9 Trip → Where was fault?

h) CB 6, 9, 8, 11 Trip → Where was fault

i) CB2 Trips Where was fault

j) CB1 Trips Where was fault

k) CB7 Trips Where was fault

l) For a fault on bus III, which CB's
   1) Trip first
   2) If the ones which should trip first don't which ones should trip next.