Ongoing List of Topics:

- URL: http://www.ece.mtu.edu/faculty/bamork/EE5223/index.htm
- Labs - EE4224/5224 - Start Wed this week
  - Locals: confirm operation.
  - Online Students - I will e-mail you Remote Desktop instructs

- Aside for the day: CCVTs for voltage measurement + Comm
- Radial Protection (read sections 12.5, 12.6, also G&S Ch.10)
- Basic issues of radial protection, see “Radial Prot” handout
- Type 51 (inverse time-overcurrent relay) settings
- Fuse characteristics
- Instrument transformers: VTs, CTs, CCVTs, MOCTs, etc.
- CTs - pedestal vs. bushing
- CT saturation & accuracy, ratios, multi-ratio CTs
Simplest - share 1 or 2 bits of info as part of control logic.

Complex - Real-time control, intranet (10 Gbs).
Radial Protection

Dist. Sub.

34.5 - kv
41.6 - kv
69 - kv
115 - kv

Recloser (CB w/ relays)

50/51/79

Cust 3

F1

F2

F35

Sectionalizers

Cust 1

Cust 2

- Not all faults are permanent. Wind, squirrels, birds, etc

- Must wait approx 30 cycles or so for air to de-ionize (after de-energizing).

"Fast trips" first.

- Reclose.

Give up? => Slow trip, Fuse Blows
Fuse Curves

Fast trips $\Rightarrow$ prevent melt damage
Slow trips $\Rightarrow$ long enough to clear

$F_2$

Max Clear

Fast trip $< t_1$
Slow trip $> t_2$

$t_1$
$t_2$

Isc

Isq for fault at Cust.2
3 phase: 2-3%

L-L: 8-10%

L-L-G: 10-17%

L-G: 70-80%

NEXT: Read Radial Protection handout posted in Week 2!