






### Topics for Today:

- Course Info:
  - Web page: <http://www.ee.mtu.edu/faculty/bamork/ee5220/>
  - Book, references, syllabus, more are on web page.
  - Software - Matlab. ATP/EMTP [ License - [www.emtp.org](http://www.emtp.org) ] ATP tutorials posted on our course web page
  - [EE5220-L@mtu.edu](mailto:EE5220-L@mtu.edu) (participation = half letter grade, 5%)
- Term Project - Final Report - completed by Fri April 25<sup>th</sup> 
- Term Project - On-campus teams present on Tues Apr. 29<sup>th</sup> 1pm - 3:30pm)
- Class collaborative exercise - "HW11" -- last chance to get participation points!  
Due noon April 30<sup>th</sup>.
  -  E-mail discussion, contribute, assemble results, add notations, hand in.
  -  Case 1a and 1b simulation posted at L38. Three-pole switching, CB issues
  - Case 2 - statistical switch 
  -  Case 3 - repeat Dr. Bohmann's example on reactor switching.
- All work needs to be completed and turned in by noon April 30<sup>th</sup>. (Dr. Mork is traveling to NSF on afternoon of Thurs May 1<sup>st</sup>, and will be in back in the office the afternoon of Mon May 5<sup>th</sup>. Grade submission deadline (immovable) is 5pm May 5<sup>th</sup>. Given lead times in grading and calculating grades, it will be nearly impossible to stretch submission dates past April 30<sup>th</sup>. If you have a very compelling situation, please contact me.

## Class Exercise or "homework 11"

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As discussed in the previous lectures, we have one last collaborative class exercise which will count as HW11. This can be turned in any time before noon on Wed Apr 30th. The solution can be freely-shared and discussed and collaborated on via our e-mail discussion forum. Submittal should be just like with homeworks, one by each homework pair, or it can be individually submitted if you work alone. Case 1 simulation has been built for you, but you should take a look at parameters and modify them for the voltage level and MVAR size of the cap bank of your choosing.

Case 1a - Cap bank deenergization, with grounded neutral.

Case 1b - Cap bank deenergization, with ungrounded neutral.

Case 2 - Statistical Switching - Synchronized closing (energization) of cap bank.

Case 3 - Reactor Deenergization, pp.10-15 of Reactor Switching Handout.

In each case, document the problem and the simulation, then provide an explanation of what is happening and why in the context of the concepts and theories involved.

## Class Wrap-Up

- Pre-Req: - Circuit Analysis. - R-L-C.
  - "Easy" course.
  - Time since took the course.
- Add time-domain review videos to the existing 6 videos.
- Flexibility - A couple days extra. For
  - Must caught up in time for
    - Midterm
    - End-of-semester.
- Deadlines: Friday - on-campus  
Monday - on-line.
- Posting answers: within ~5 days.

## Content:

- Ckt analysis / ATP simulation Pkg.
  - 3 weeks.
- Cap Bank Sw.
- XFMR models, inrush.
- T-Line Models
- Lightning
- Insulation Coordination
  - Surge Arresters
  - Dielectrics

# Term Projects

- WK 6: start process.
  - Proj Expectation
  - Report Outline
  - Propose idea
- WK 8 - detailed outline.
- WK 12 - Journal
- WK 14 - Report done
- Finals wk - Presentations.

# Weighting 5-

- Midterm: 30%
- Participatib: 5%
- Homework: 30%
- Term Proj: 35%
- Jnl Pop: 10%
- Outline
- Report: 25%

- Tech Briefings.  
- Others?

= Martratech  
- Web Cam  
- Require?

