

ECE 661: ELECTROMAGNETIC TRANSIENTS IN POWER SYSTEMS

Course Data: Lecture 3. Credit 3. Prerequisites: ECE461 or equivalent.

Textbook: P. Chowdhuri: *Electromagnetic Transients in Power Systems*. Research Studies Press Limited/ John Wiley & Sons, Inc., 1996.

Instructor: P. Chowdhuri, Professor of Electrical Engineering

Goals: To develop an understanding of the phenomena of electrical transients and to apply techniques to protect electrical power systems against such transients.

Prerequisites by Topic: Power system fundamentals

Topics:

1. Sources of Transients
 - a. Lightning
 - b. Switching
2. Traveling Waves on Transmission Lines
3. Lightning
 - a. Physical Phenomena of Lightning
 - b. Direct Stroke
 - c. Induced Stroke
4. Simple Switching Transients
 - a. Circuit Closing
 - b. Circuit Opening
5. Abnormal Switching Surges
 - a. Current Suppression
 - b. Capacitive Switching
 - c. Restrike Phenomena
 - d. Ferroresonance
 - e. Interruption in DC Systems
6. Behavior of Windings under Transient Conditions
7. Protection Against Transients
 - a. Shielding
 - b. Grounding
 - c. Surge Protectors
 - d. Insulation Coordination
 - e. Protection of Low-Voltage and Control Systems

Spring 2001

**ECE 661: Electromagnetic Transients
in Power Systems**

**P. Chowdhuri
Room: PH311
Tel.: 372-3682**

Course Policies

1. Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119.

2. Final grades will be based on the following:

Test 1	20%
Test 2	30%
Final	50%

Letter Grades: A = 90-100; B = 80-89; C = 70-79; D = 60-69; F = below 60

3. Homework will be assigned on a regular basis. Computation by digital computer and use of computer plotting will be needed. Although homework will not count in the final grade, performance on homework will be weighed in for borderline cases.

4. Students are encouraged to take active part in technical discourse.

5. Office hours are as follows:

8:00 a.m. to Noon, MWF

Students may see me at any other mutually convenient times. Students are encouraged to keep in touch with me on a regular basis to discuss technical topics and/or their personal concerns.

For distance-learning students, I am available via e-mail (pchowdhuri@tntech.edu), telephone (931-372-3682) and FAX (931-372-6369). For multiple students in one site, I plan to visit on a regular basis at mutually convenient times.

6. Discussion among students concerning homework and course topics is highly encouraged. However, plagiarism and unethical behavior will not be tolerated.

7. Technical tours will be arranged when possible. Students are strongly advised to participate in these tours.