

Internet-Based Short Course on your own PC
Teaching Power Systems with Integrated Software Laboratory
By Prof. Ned Mohan, University of Minnesota

Friday April 28, 2006

2:30PM – 5:30PM Minneapolis Time

(On-demand video can be watched anytime of your choosing for 3 months after the broadcast)

Objective: To show that in just a one-semester undergraduate course, with an integrated state-of-the-art software laboratory, students can learn almost twice the number of topics with much greater depth than in conventional courses. We will use evaluation versions of *PowerWorld* and *PSCAD/EMTDC*, and *MATLAB/Simulink*. This assertion is backed up by a **textbook** listed as a **Reference** below.

13-Week Proposed Structure of Lecture Topics and Laboratories

Week	Topics	Laboratory
1	Topic 1: Overview Topic 2: Fundamentals	Lab 1: Visit to a local substation
2	Topic 3: Energy Sources	Lab 2: Introduction to <i>PSCAD-EMTDC</i> ; 3-phase circuits
3	Topic 4: Transmission Lines	Lab 3: Transmission Lines using <i>EMTDC</i>
4	Topic 5: Power Flow	Lab 4: Power Flow using <i>PowerWorld</i> and <i>MATLAB</i>
5	Topic 6: Transformers	Lab 5: Transformer Saturation in <i>PSCAD-EMTDC</i> ; Including off-nominal and phase-shifting transformers in <i>PowerWorld</i>
6	Topic 7: Distribution Systems	Lab 6: Power Quality using <i>PSCAD-EMTDC</i>
7	Topic 8: HVDC, FACTS	Lab 7: Power Converters and HVDC using <i>PSCAD-EMTDC</i>
8	Topic 9: Voltage Regulation and Stability	Lab 8: Voltage Regulation and Stability using <i>PowerWorld</i>
9	Topic 10: Synchronous Generators	Lab 9: Synchronous Generators and Automatic Voltage Regulation in <i>EMTDC</i> .
10	Topic 11: Transient Stability	Lab 10: Transient Stability using <i>MATLAB</i>
11	Topic 12: AGC, Economic Dispatch	Lab 11: AGC using <i>Simulink</i> and OPF using <i>PowerWorld</i>
12	Topic 13: Short-Circuit Faults, Relays, Circuit Breakers	Lab 12: Transmission Line Faults using <i>PowerWorld</i> and <i>MATLAB</i>
13	Topic 14: Transient Over-Voltages, Surge Arrestors, Insulation Coordination	Lab 13: Over-voltages and Surge Arrestors using <i>PSCAD-EMTDC</i>

REFERENCE:

First Course on Power Systems by Ned Mohan, 2006 edition, ISBN 0-9715292-7-2, www.mnpere.com.

Intended Audience:

Although of direct interest to educators, this course will also be very useful to Practicing Power Engineers as a refresher, and a good Power Systems introduction to non-Power Professionals and students.

Registration:

This course is completely **FREE-OF-CHARGE** but the registration is required by April 3, 2006 by sending an e-mail to mohan@umn.edu so we may send you the password (to help us, type Registration for the Power Systems Course on the subject line and leave the rest of the e-mail blank).