

# ECE 4613: Power Transmission Systems

**Text:** Power System Analysis and Design, J.D. Glover & M. Sarma, Third Edition

## Topical Outline of Course

Topics Covered in Chapters 1-6, 12 and 13

1. Fundamentals of balanced three phase networks
  - a. Phasors and Complex Power
  - b. Three phase circuits
  - c. Transformers
  - d. Per-Unit System
  - e. Network Equations and Y-Matrix formulation
2. Transmission Lines Modeling and Steady State Performance
  - a. Line Parameters (R,L,C) including solid, stranded and bundled conductors
  - b. Equivalent Circuit
    - i. Lossless, Long, Medium and Short line presentation
    - ii. Equivalent and nominal  $\pi$  representation
    - iii. Maximum Power Flow and Line Loadability
    - iv. Reactive Compensation Techniques
3. Power Flow
  - a. Solutions of Linear and Nonlinear Algebraic Equations
  - b. Power-Flow Problem
  - c. Power-Flow Solutions by Gauss-Seidel and Newton-Raphson
  - d. Fast Decoupled Power Flow
4. Transient Operations and Transient Stability
  - a. The Swing Equation
  - b. Equal-Area Criterion