Lecture 1: Transmission planning

• Transmission vs. transportation
• Transmission system capacity
• Two quasi-orthogonal issues
  – Reliability
  – Congestion
• Assessment using real and reactive criteria
Lecture 2: Generation planning

- **Two contexts**
  - Traditional vertically-integrated regulated monopolies
  - Modern competitive power markets

- **Assessing needs**
  - Probabilistic models – LOLP
  - Deterministic short-cut – reserves
  - Global and local needs

- **Options and modeling**
  - Conventional generation
  - Renewable generation
  - Demand-side resources - negawatts
Lecture 3: Strategic & least-cost planning

- Resolving conflicting objectives
- Considering an expanded set of options
- Managing uncertainty and risk

Lecture 4: Cascading blackouts

- A large system problem – “big is different”
- In a man-machine system of 3 elements
  - Current generating and carrying hardware
  - Control and protective devices
  - Practices and procedures
- Failures in the 2nd and 3rd elements, with the system stressed, initiate all cascading blackouts
- Measuring and reducing stress