

ECE Course Outline

ECE6322 - Power System Planning and Reliability (3-0-3)

Prerequisites: ECE 4320

Corequisites: None

Catalog Description: To introduce basic concepts as well as analysis and optimization techniques underlying reliability assessment of electric power systems and planning techniques.

Textbook(s):

Endrenyi, *Reliability Modeling in Electric Power Systems*, John Wiley, 1978. (required)
(comment: Print on demand.)

Topical Outline:

Review of Power System Planning Techniques

Review of Probability concepts

Power System Reliability

- Component

- System

- Margin requirements

- Cost of interruptions

- Value based reliability analysis

- Transmission access impact

- Generation reliability

- Transmission reliability

- Distribution reliability

Corporate planning

- Forecasting

 - Load growth

 - Economic environment

 - New technologies

- Project financing

Amortization

Cost of capital

Taxation

Cost-benefit analysis

Long-term reliability

Generation planning

Engineering models

Simulation tools

Load forecast models

Production costing

Economic dispatch

Pollution dispatch

Reliability constraints

Inventory management (cost vs. risk)

Least cost planning / integrated utility planning

Comparative evaluation of alternatives

Available tools

Corporate models

Transmission planning

Engineering models

Environmental constraints

Reliability/security constraints

Value based transmission resource analysis (VBTRA)

Available VBTRA tools

Impact of transmission access

Impact of third party producers

Corporate models