**Power System Planning and Reliability**

**Instructor: Sakis Meliopoulos**

|  |
| --- |
| **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  Meliopoulos, *Basic Power System Planning Methods*, (Notes provided by instructor)  **Grading Policy**  Homework: 0% (but required) Three major assignments: 3 x 25% (midterm and two projects, or three projects) Final exam or project: 25% |
| **Topical Outline:**  Review of Power System Planning Techniques  Review of Probability concepts  Power System Reliability  Component  System  Margin requirements  Analytical Techniques  Cost of interruptions  Value based reliability analysis  Transmission access impact  Generation reliabiity  Transmission reliability  Distribution reliability  Corporate planning  Forecasting  Load growth  Economic environment  New technologies  Project financing  Amortization  Cost of capital  Cost Accounting  Taxation  Cost-benefit analysis  Long-term reliability  Probabilistic Production Costing  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/securiety constraints  Value based transmission resource analysis (VBTRA)  Available VBTRA tools  Impact of transmission access  Impact of third party producers  Corporate models |