Course Syllabus

1. **Overview of resource planning**: basic principles and processes; relationship with other planning and operations functions; effects of uncertainty.

2. **Reliability evaluation**: basic models of loads and resources; continuous transition Markov process and discrete state characterization; reliability indices and criteria; effective capacity; computational schemes.

3. **Reliability worth**: basic economic considerations; the value of service concept; customer surveys; computations.

4. **Multi-area reliability**: model for the interconnection system; maximum flow principles; state space decomposition; Monte Carlo simulation.

5. **Production costing**: models of loads and resources for probabilistic simulation; multi-state and multi-block units; energy limited plants; storage plants; time-dependent units; expected emission calculations; computational procedures.

6. **Marginal costing**: basic concepts of short-run marginal energy and marginal capacity costs and schemes for their evaluation.

7. **Supply-side planning**: optimal resource mix determination; optimal capacity expansion; mathematical programming framework; long-run marginal costs; sensitivity analysis.

8. **Demand-response resources**: the role of loads in electricity markets and the impacts on planning: the notion of price-responsive load and demand elasticity; demand response resources; characteristics of demand-side programs; economic considerations; assessment of impacts.

9. **Integrated planning**: framework for consistent assessment of supply and demand-side resources; incorporation of uncertainty; least cost planning; internalization of environmental externalities; mathematical programming formulation.

10. **Impacts of competitive environment on planning decisions**: the risk issues, the effects of various financial and spot markets; assessment of the worth of assets; application of financial tools in planning.

Papers of interest will be reviewed and discussed. Students will form teams to undertake the study and preparation of a presentation on a topic related to the course outline. Homework assignments are not corrected but solutions are posted. Grading is based on the midterm exam, the presentation and the Final Exam.

**Final Exam** is scheduled for 7:00 – 10:00 p.m. on Thursday, December 20, 2018 in Rm. 2013 ECEB.