1. **Course Description & Prerequisites**

This class will focus on a series of topics related to Locational Marginal Pricing. Information presented in the course "Restructured Electricity Markets: Locational Marginal Pricing" will be used as background material and will be assumed as already known.

2. **Course Outline**

**First time slot:** Recent history of electricity market restructuring in Texas.

1. Milestones in Texas electricity restructuring (15 minutes)
   - Offer-based economic dispatch in the absence of transmission constraints.

2. Introduction to the basics of offer-based economic dispatch, including notation to be used for the rest of the course (75 minutes).
   - Surplus
   - Feasible production set
   - Need for centralized coordination
   - Optimization formulation
   - Generation offers
   - Demand specification
   - Demand bids
   - Dispatch calculation
   - Pricing rule
   - Incentives
   - Dispatch supporting prices
   - Value of lost load and implications for pricing and incentives
Second time slot: Generalizations of offer-based economic dispatch.
This section will generalize the basic formulation to the case where there are multiple commodities. This will be the bridge to considering

1. Transmission constraints (90 minutes):
   - Ancillary services: reserves and regulation
   - Decision variables
   - Generator constraints
   - System constraints
   - Commodities

Third time slot: Locational marginal pricing (90 minutes).

1. This will be the core material on locational pricing.
   - Optimal power flow
   - DC optimal power flow
   - Offer-based optimal power flow
   - Examples

Fourth time slot: LMP continued and introduction to hedging

1. Locational marginal pricing, continued (30 minutes).
   - Properties of locational marginal prices
   - Congestion rent (merchandising surplus) and congestion cost
   - Contingency (or security) constraints

2. Introduction to hedging of energy and transmission price risk (60 minutes).
   - Volatility of energy prices
   - Forward markets
   - Contracts for differences
   - Relationship to capital formation
   - Transmission prices
   - Financial transmission rights
   - Revenue adequacy

Optional additional topics:
   - Transmission planning
   - Highlighting the recent developments of transmission for wind in Texas

3. References

This class will cover topics from a number of fields. Consequently the course slides will be the main material used. More literature and online slides at http://users.ece.utexas.edu/~baldick/classes/394V/EE394V.html