

EE710.htm
METU
Graduate School of Natural and Applied Sciences

1.Course Code and Title :**EE 710 Electricity Trading**

2. Catalogue Data

Basic structure of liberalized electrical markets, principles of deregulation, competition and market architecture, market power, wholesale trading, risk management, bilateral and multilateral contracts, hedging, eligible customers, national and cost based tariffs, price cap and revenue cap techniques, stranded costs, balancing and settlement task, spare-reserve capacity, marginal costs, quality of electricity, conditions for quality, retail wheeling, regulation of retail prices, demand management, regulation of transmission system, congestion management, implicit and explicit auctioning, ancillary services, regulation of distribution system, electricity trading by renewables, back-up and capacity trading by renewables, energy regulatory authorities, licensing, market monitoring, market monopoly, cross-monopoly, oligopoly, dominant position and abuse.

3.Frequency :**Spring**

4.Faculty Member(s) involved in course

1. Prof. Dr. Osman SEVAİOĞLU, 2. Prof. Dr. İsmet ERKMEN, 3. Prof. Dr. Nezh GÜVEN

5.Background required

Principles of electrical power transmission and distribution systems and system analysis, principles economy, marketing, pricing and cost analysis

6. Overlapping and Complimenting Courses

None

7. Textbook(s)

1. Power System Economics, Designing Markets for Electricity, Steven STOFT, IEEE Press, Wiley-Interscience, 2002, 468 pages, 2. Electricity Economics, Geoffrey ROTHWELL and Thomas GOMEZ, IEEE Press, Wiley-Interscience, 2003, 300 pages, 3. Effective Power Marketing, Clark W. GELLING, PennWell, 1998,204 pages, 4. Retail Wheeling, Peter C. CHRISTIANSEN, PennWell, 1996, 328 pages, 5. Market Operations Electric Power Systems, SHAHIDEHPOUR, H. YAMIN Zuyi LI, IEEE Press, WOHN WILEY, 2002, 6. Energy Power and Risk Management A. EYDELAND, K. WOLYNIEC, John Wiley, 2003, 7. Creating Competitive Power Markets, J. D. LAMBERT, 2001, 8. Electricity Retail Wheeling Handbook, J. M. STUDEBAKER, The Fairmont Press, 2001, 9. Privatization, Restructuring and Regulation of Network Utilities, D. M. NEWBERY, 10. The Walras-Pareto Lectures, University de Lausanne, MIT

Press, 2001, 11. Power Branding, Ann CHAMBERS, PenWell Books, 1998, 12. Making Competition Work in Electricity, Sully HUNT, John Wiley, 2002, 13. Effective Power Branding, C. W. GELLING, PenWell Books, 1997, 14. Deregulation of Electric Utilities, Ed. by. G. ZACCOUR, Kluwer Academic Publishers, 1998, 15. 5. Electricity Reform, Social and Environmental Challenges, Ed. by Njeri WAMUKONYA, UNEP, United Nations Environmental Program, UNEP Riso Center, Roskilde, Denmark, 16. Power System Restructuring and Deregulation, Ed. By. Loi Lei LAI, John WILEY, 2001

8. References

1. Power System Analysis, John J. GRANGER AND W. D. STEVENSON, Mc. Graw Hill, 1994, 786 pages, 2. Electric Power Systems, B. M. WEEDY and B. J. CORY, John Wiley and Sons, 1999, 546 pages, 3. Electrical Energy Systems Theory: An Introduction, Olle I. ELGERD, Tata Mc Graw Hill Publishing Company Ltd., New Delhi, 1975, 564 pages, 4. Enerji Ekonomisi, F. Behçet YÜCEL, Febel Ltd. Şti, Tel. 0 212 252 83 00, 858 pages, 242 pages

9. Course Objectives

Main objective of the course is to make the students acquainted with the basic principles electricity trading. Electricity trading is an area where, engineering, economy, regulation and legislation disciplines intersect. The subject is rather new and the need for graduates equipped with relevant and up to date knowledge about electricity trading is rapidly growing as the electricity market is deregulated within the directives of EU. A successful student is expected to gain knowledge on the structure, participants, relations and principles of the deregulated electric power market. 11111

10. Course in relation to Program(s)

This course is intended to be one of the basic courses for the "Energy Engineering" Program to be established in the mean future under the framework of Graduate School of Natural and Applied Sciences. 11. 11. 11. 11. 11.

11. Course Outline

1. Week: **Basic structure and operating principles of electrical power systems; generation, transmission and distribution systems, operating states of a power system,**
2. Week: **Principles of deregulation, vertical unbundling, third-party access, non-discrimination, competition and market architecture,**
3. Week: **Wholesale electricity trading, risk management, estimation of medium and long term wholesale market prices,**

4. **Week: Principles of contracting, bilateral and multilateral contracts, short, medium and long term contracting, hedging**
5. **Week: Concept of eligible customers, eligibility conditions, aggregation of non-eligible customers, rights and duties of eligible customers,**
6. **Week: Regulation of end user electricity prices, components of electricity prices, national and cost based tariffs, pricing of the losses and illicit utilization, price cap and revenue cap techniques,**
7. **Week: Stranded costs in electricity prices, sources of stranded costs, estimation of the effect of stranded costs on electricity prices, remedies for stranded costs,**
8. **Week: Balancing and settlement task, functions of balancing and settlement centers, spare-reserve capacity, marginal costs, secondary or spot markets, software and hardware aspects of balancing and settlement task,**
9. **Week: Quality of electricity, conditions for quality, retail wheeling, competition among main and other retailers, daily load curve, demand management, demand elasticity, techniques for electricity metering, recording and billing**
10. **Week: Transmission system management, regulation of the transmission system, financing of transmission system investments, transmission system usage and service charges, congestion management, congestion pricing; ordering, implicit and explicit auctioning, grid code,**
11. **Week: Ancillary services; objectives and types of ancillary services, pricing of ancillary services,**
12. **Week: Distribution system management, regulation of distribution systems, financing of distribution system investments, distribution system service and connection charges, distribution code,**
13. **Week: Electricity trading by renewables, customer problems associated with renewables, Back-up and capacity trading by wind and river type renewables, incentives for renewables,**
14. **Week: Duties of energy regulatory authorities, market power; market monitoring, monopoly, cross-monopoly, oligopoly, dominant position and abuse,11111**

12. Course Conduct

It is possible to conduct the course by means of term paper/project assignments, assigned seminars, invited seminars, tutorials, criticism and computer applications. For the first year however, the course will be given in formal lectures by means of power point presentation, as most of the

instructive effort will be devoted to preparation of the main course material.11111

13. Grading

Formal examinations (2 midterms and one final)

14. Effective Date :**Spring 2004**

15. Prepared by :Prof. Dr. Osman SEVAİOĞLU

Course accepted by Graduate Committee in meeting held on/...../.....

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Chairperson of Department

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