

Fill this form and send or fax a copy before 19<sup>th</sup> October 2007 to:

Mrs. Eleni Avlonitou  
National Technical University of Athens - NTUA  
School of Electrical and Computer Engineering  
Electric Power Division  
Electric Energy Systems Laboratory  
9, Heron Polytechniou str.  
157 73 Zografou, ATHENS  
GREECE  
Phone: +30-210-7723699  
Fax: +30-210-7723968

## Pre-Registration Form

Name: \_\_\_\_\_  
Company: \_\_\_\_\_  
Position: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Company main activity: \_\_\_\_\_

### COURSE FEES

The course fees include attendance of lectures, documentation, coffee breaks, lunches and one official dinner.

Members of the EES-UETP: 525 EUR  
University non members of the EES-UETP: 900 EUR  
Industry non members of the EES-UETP: 1500 EUR

NTUA will send an invoice to each registered participant, after the reception of the filled Registration Form.

Payments are requested before the beginning of the Course.

### ACCOMMODATION

Special prices have been arranged at the following recommended hotel nearby the University:

GOLDEN AGE Hotel, 57 Michalakopoulou str., Zografou, Athens, tel. +30 210 -7240861, fax. +30-210-7213965, [goldenage@ath.forthnet.gr](mailto:goldenage@ath.forthnet.gr). The price for a single/ double room is 115 euros (breakfast and taxes are included).

Reservations before October 25<sup>th</sup>, 2007 are warmly recommended – password: **NTUA-Course**

### INFORMATION - REGISTRATION

Mrs. Eleni Avlonitou  
National Technical University of Athens - NTUA  
School of Electrical and Computer Engineering  
Electric Power Division  
Electric Energy Systems Laboratory  
9, Heron Polytechniou str. 157 73 Zografou, ATHENS  
GREECE  
Phone: +30-210-7723699, Fax: +30-210-7723968  
e-mail: [eavlon@power.ece.ntua.gr](mailto:eavlon@power.ece.ntua.gr)



**National Technical University of Athens**  
**Electric Energy Systems Laboratory**

## 2007 Course Program

**Probabilistic Planning and  
Operation of Power  
Transmission Systems in a  
Competitive Market**

**November 12<sup>th</sup> -14<sup>th</sup>, 2007**  
**Athens, Greece**



COURSE LOCATION

LIBRARY BUILDING OF NTUA Campus  
9, Heron Polytechniou str. 157 73 Zografou, ATHENS  
GREECE



## OBJECTIVES

The general trend in modern power systems is to increase competition in order to achieve better performance and efficiency in the electricity production, transmission and distribution. In the competitive electrical energy market the role of transmission systems becomes more important, since it must enable the competition. Therefore, strategies must be developed to ensure that the system will be able to optimally utilise its facilities since it will experience an increase in the number of energy sales and purchases.

In the competitive electrical energy market, several players have access to the transmission systems even though in a regulated way. Next to the traditional thermal and large hydroelectric plants, these players include producers based on renewable energy sources (like wind) and aggregate distributed generators. This means that the commercial and the energy/power transactions through the transmission systems become more and more frequent tasks, superimposing the original system task aimed at feeding the load demand. The task of quickly and accurately evaluating the merits of transactions is becoming an important function of utility system planners and operators. This is because it affects vital system attributes (security, adequacy, quality, etc.), puts a strain on the existing transmission system and may restrict the economic dispatching of power generation. Furthermore, the reliability performance of the transmission system together with the reliability indices of service supplied to system customers constitute one of the major aspects that are taken into account in the system planning and operating phases. It is therefore evident that there is a need for planning and operating considerations that must be followed by the transmission system operators, energy suppliers and customers in order to assure that they will be able to operate reliably and safely together.

All the above aspects need a probabilistic modelling and evaluation assessment since the existing deterministic criteria and standards can not simulate realistically all the existing features of transmission systems and their customers. The objective of the seminar is to identify the

most important areas that need probabilistic modelling and evaluation assessment and present:

- the state of the art knowledge of the existing computational methods
- efficient computational methods that can be applied for the analysis of the respective problems (analytical techniques, simulation approaches, artificial intelligence methods)
- application examples by using practical transmission systems and case studies
- important conclusions concerning the necessary procedures and practices for the planning and operation of transmission systems in the new market environment.

The instructors of the seminar have significant teaching and research experiences in the respective areas of concern.

## INTENDED AUDIENCE

This course is intended for professionals of Electric Power Utilities, System Operators (Independent System Operators – ISOs, Regional Transmission Operators – RTOs, Transmission System Operators - TSOs), power system consultants, researchers and post-graduate students.

The number of attendees is limited.

## COURSE DURATION

Three days, from Monday, 12<sup>th</sup> to Wednesday 14<sup>th</sup> of November 2007.

## CONTENTS

### Monday, 12<sup>th</sup> November

- |               |  |
|---------------|--|
| 09.00 – 09.15 | Registration and documentation   |
| 09.15 – 09.30 | Opening Session  |
| 09.30 – 11:00 | <b>Introduction – Transmission System Challenges – Probabilistic Modelling Aspects</b> (E. Dialynas)                               |
| 10:30 – 11:30 | Coffee Break   |
| 11:30 – 13.00 | <b>Transmission System Considering Uncertainty – Standards – Probabilistic Modelling – Optimisation Issues</b> (A. Papalexopoulos) |
| 13:00 – 14:00 | Lunch  |
| 14:00 – 15:00 | <b>Transmission System Considering Uncertainty – Standards – Probabilistic</b>   |

### Modelling – Optimisation Issues

(A. Papalexopoulos)

15:00 – 15:30

Coffee Break

15.30 – 17:00

**Probabilistic Load Flow Modelling and Applications** (N. Hatzigiorgiou)

### Tuesday, 13<sup>th</sup> November

09:00 – 10:30

**On Line Security Assessment of Power Systems Using Automatic Learning Techniques** (N. Hatzigiorgiou)

10:30 – 11:00

Coffee Break

11.00 – 12.30

**Assessment of Transmission System Performance - Quality of Supply - Indices** (E. Dialynas)

12:30 – 13:30

Lunch

13:30 – 15:00

**Well-being Analysis of Power Systems** (V. Miranda)

15:00 – 15:30

Coffee Break

15:30 – 16:30

**Well-being Analysis of Power Systems** (V. Miranda)

### Wednesday, 14<sup>th</sup> November

09:00 – 10:30

**Decision Making Using Risk and Reliability Indices** (M. Matos)

10:30 – 11:00

Coffee Break

11.00 – 12.00

**Decision Making Using Risk and Reliability Indices** (M. Matos)

12:00 – 13:00

**Reliability and Cost Assessment of Composite Generation and Transmission System Operating in a Competitive Market** (E. Dialynas)

13:00 – 14:00

Lunch

14:00 – 15:00

**Reliability and Cost Assessment of Composite Generation and Transmission System Operating in a Competitive Market** (E. Dialynas)

15:00 – 16:00

Final Discussion and closing session

## INSTRUCTORS

**Evangelos Dialynas** (NTUA, Greece)

**Manuel Matos** (INESC-Porto, Portugal)

**Vladimiro Miranda** (INESC-Porto, Portugal)

**Alex Papalexopoulos** (ECCO International Inc., USA)

**Nikos Hatzigiorgiou** (NTUA, Greece)

## COORDINATORS

**Evangelos Dialynas** (NTUA, Greece)

dialynas@power.ece.ntua.gr

**Nikos Hatzigiorgiou** (NTUA, Greece)

nh@power.ece.ntua.gr