

COURSE FEES

The course fees include lectures attendance, course aids (lectures on pen drive, leaflets, brochures), coffee breaks, three lunches and a course dinner in a restaurant.

Members of the EES-UETP: **367.50 EUR**
University non-members of the EES-UETP: **900.00 EUR**
Industry non-members of the EES-UETP: **1500.00 EUR**

The Course Secretariat will send an invoice/receipt to each registered participant, after the reception of the filled Registration Form, together with the bank transfer.

The number of attendees is limited and the registration deadline is 15th July 2018.

The course is held only with the minimum number of 12 people.

Other information can be found at:
<http://www.ees-uetp.com/>

or by phone

Ms. Paula Castro
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INFORMATION, REGISTRATION AND COURSE LOCATION

Ms. Paula Castro
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Dr. Ricardo Bessa
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ACCOMMODATION

The following hotels are suggested: Hotel Ibis Porto S. João (5 minutes walking distance from INESC TEC), Axis Business (15 minutes walking distance from INESC TEC), NH Collection Porto Batalha (down town) and Eurostars Porto Douro (down town/Douro River).

Hotel Ibis (Porto S. João) ***
Phone: (+351) 22 551 31 00
<http://www.ibishotel.com>

Hotel Axis Business & SPA ****
Phone: (+351) 229 052 000
<http://www.axishoteis.com/>

Hotel NH Collection Porto Batalha****
Phone: +351 210 020 848
<https://www.nh-collection.com/hotel/nh-collection-porto-batalha>

Eurostars Porto Douro****
Phone: +351 223 402 750
<http://www.eurostarshotels.com.pt/eurostars-porto-douro.html>



**Electric Energy Systems University
Enterprise Training Partnership**

<http://www.ees-uetp.com/>

2018 Course Program

**Advanced Data Analytics for Energy
Systems**

September 3rd - 5th, 2018



INESC TEC
Campus da FEUP
Rua Dr. Roberto Frias, s/n
4200 - 465 Porto

**Organized by
INESC TEC**

OBJECTIVES

The technological revolution in the electric power system sector is producing large volumes of data with relevant impact in the business and functional processes of system operators, energy utilities and grid users. This course aims to cover different theoretical and practical aspects of data analytics in energy systems, according to the following viewpoint:

(1) The future generation of big data functions will combine spatial-temporal information and distributed learning techniques that exploit recent advances in high performance and distributed computing.

(2) The output should be probabilistic (uncertainty) information and with high value for integration in decision-aid methods under risk.

(3) Deep learning techniques represent an added value for automatic feature extraction and reduction, but manual feature engineering using domain (expert) knowledge cannot be abandoned.

(4) Machine learning algorithms can be used to control grid assets, for instance embedded in reinforcement learning techniques or to create proxy models for complex physical systems.

(5) Creation of new business models for knowledge extraction from data is also expected in a near future. Some examples are data analytics for consumer engagement in demand response, big data pre-processing from grid sensors, electricity markets modelling and predictive maintenance of electrical assets.

COURSE DURATION

Three days – from September 3rd to September 5th, 2018.

CONTENTS / SCHEDULE

Day 1

Monday, September 3

9h00-9h15 – Registration

9h15-9h30 – Course Opening (*Ricardo Bessa*)

9h30-10h30 – Data streams and online learning (*João Gama*)

10h30-11h00 – Coffee-break

11h00-12h30 – Data streams and online learning (*João Gama*)

12h30-14h00 – Lunch

14h00–16h30 – Statistical learning for uncertainty forecast (*Jethro Browell*)

16h30-17h00 – Coffee-break

17h00-18h00 – Feature engineering to improve time series forecasting (*Ricardo Bessa*)

Day 2

Tuesday, September 4

9h30-10h30 – Reinforcement learning for data-driven optimization (*Damien Ernst*)

10h30-11h00 – Coffee-break

11h00-12h00 – Reinforcement learning for data-driven optimization (*Damien Ernst*)

12h00-13h15 – Lunch

13h15-14h15 – Introduction to deep learning (*Stefan Leijnen*)

14h15-15h15 – Implementation of deep learning with TensorFlow (*Frank Aldershoff*)

15h15-16h15 – Decision-making under risk (*Manuel Matos*)

16h15-16h30 – Coffee-break

16h30-18h00 – Data analytics for asset management (*Bruce Stephen*)

Day 3

Wednesday, September 5

9h00-10h30 – Data analytics in transmission system operators (*Miguel Moreira da Silva*)

10h30-11h00 – Coffee-break

11h00-12h30 – Big data analytics for electrical utilities (*Pedro Ferreira*)

12h30-13h30 – Lunch

13h30-15h00 – Data mining for modelling electricity markets (*José Villar Collado*)

15h00-16h30 – Consumer engagement with big data techniques (*Vassilis Nikolopoulos*)

INSTRUCTORS

Bruce Stephen

University of Strathclyde, Scotland

Damien Ernst

University of Liège, Belgium

Jethro Browell

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João Gama

INESC TEC/FEP, Portugal

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COURSE COORDINATOR

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