Winter School on Advanced Technologies Applied to Renewable Energy Systems

December 26 to 29 in Sousse, Tunisia

This winter school brings together researchers, industrialists and experts to explore the latest technological innovations (AI, IoT, etc.) in the field of renewable energies. Workshops are planned on management, forecasting energy consumption in smart grids and green hydrogen applied to electric vehicles.

Organized by: The Laboratory of Sciences and Techniques of Automation and Industrial Computing (Lab-STA), Laboratory of Electronics and Information Technology (LETI), ENIS, University of Sfax, Tunisia, and Laboratory of Electrical Engineering and Power Electronics (L2EP), HEI-Junia Lille, France.

The winter school is supported by Doctoral School Sciences and Technologies EDST-ENIS and Digital Research Center of Sfax (CRNS).

Honorary Chairs	General Chairs	Program Chairs	Organizing committee
Mohamed CHAABANE, Tunisia	Moez ALLOUCHE, Tunisia	Hafedh ABID, Tunisia	Mariem GHAMGUI, Tunisia
Ines KAMMOUN, Tunisia	Maher KHARRAT, Tunisia	Karim DAHECH, Tunisia	Tarak AROUI, Tunisia
Ahmed FAKHFAKH, Tunisia	Amin SALLEM, Tunisia	Mourad LOULOU, Tunisia	Yousef AGREBI ZORGANI, Tunisia
M. Slim ABBES, Tunisia			

Workshop 1
- Artificial Intelligence in Renewable Energy Applications
- Bassem BEN HAMED, ENET'Com, Tunisia

Workshop 2
- Intelligent Energy Management in Smart Grids (Real Case studies)
- Dhaker ABBES & Khaled ALMAKSOUR, Junia, France

Workshop 3
- Technico-Economic Analysis and Real Cases studies of PV Power Plants
- Abdelkarim OUALI, STEG, Tunisia & Amin SALLEM ISGI, Tunisia

Workshop 4
- Green Hydrogen and Fuel Cells Applied to Electric Vehicles
- Adel AITOUCHE, CRIStAL-Junia, France

Registration Fees

Academic (Tunisian University)	800 DT
Academic (Foreign University)	280 €
Participant from Industry	900 DT

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Program (Presentations are in French)

Thursday, December 26, 2024

00:00pm – 03:00pm : Registration

W1 : Artificial Intelligence in Renewable Energy Applications

This workshop will introduce the fundamental concepts of AI and machine learning, exploring their applications and impact across various industrial sectors. Participants will practice a modeling project using a real dataset, following the key steps of the machine learning cycle.

03:00pm-04:30pm	Artificial Intelligence in Renewable Energy Applications (Bassem BEN HAMED, ENET'Com, Tunisia)
04:30pm-05:00pm	Coffee break
05:00pm-06:00pm	Artificial Intelligence in Renewable Energy application (Bassem BEN HAMED, ENET'Com, Tunisia)

Friday, December 27, 2024

W2 : Intelligent Energy Management in Smart Grids

This workshop will explore the principles of optimal and predictive energy management systems within local electrical networks. Participants will learn about strategies based on forecasts of consumption, production, and CO2 emissions, utilizing feedforward neural networks trained on data from the smart-grid demonstrator at the Catholic University of Lille, France.

09:00am-10:30am	What is an Energy Management (Dhaker ABBES, Junia, Lille, France)
10:30am-11:00am	Coffee break
11:00am-00:30pm	Energy Management Optimization: Real Case study (Junia Smart grid Demonstrator) (Khaled ALMAKSOUR, Junia, Lille, France, and Dhaker ABBES, Junia, Lille, France.
00:30pm-02:30pm	Lunch
02:30pm-04:00pm	Forecasting Electricity Consumption Using Artificial Intelligence: Practical tutorial (Khaled ALMAKSOUR , Junia, Lille, France, and Dhaker ABBES, Junia, Lille, France)
04:00pm-04:30pm	Coffee break
04:30pm-06:00pm	Forecasting Electricity Consumption Using Artificial Intelligence: Practical tutorial (Khaled ALMAKSOUR , Junia, Lille, France, and Dhaker ABBES, Junia, Lille, France)

Saturday, December 28, 2024

W3 : Technico-Economic Analysis and Real Cases studies of PV Power Plants 1MWp

During this workshop, participants will explore the various aspects necessary to assess the feasibility of medium-voltage (MV) grid-connected self-production photovoltaic (PV) power plants. They will learn to control the technical elements of the project, demonstrate its economic viability, calculate key financial indicators, and analyze sensitivity to different economic and technical parameters.

08:30am-09:00am	Project Management of a PV Power Plants (Amin SALLEM, ISGI, Tunisia)
09:00am-10:30am	Presentation of MV Grid Connected self-production PV Power plants in Tunisia (Abdelkarim OUALI, PV Consulting Engineering and Trainer, Tunisia)
10:30am-11:00am	Coffee break
11:00am-00:30pm	Technical feasibility study of Grid connected PV Power plants (Abdelkarim OUALI, PV Consulting Engineering and Trainer, Tunisia)
00:30pm-02:30pm	Lunch
02:30pm-04:00pm	Economic study of Grid connected PV Power Plants – possible scenarios and sensitivity analysis (Abdelkarim OUALI, PV Consulting Engineering and Trainer, Tunisia)
04:00pm-04:30pm	Coffee break
04:30pm-06:00pm	Case study of 1 MWp Grid connected PV Power Plants, economic analysis (Determination of financial indicators) (Abdelkarim OUALI, PV Consulting Engineering and Trainer, Tunisia)
06:00pm-07:00pm	Evaluation Exam (Amira GADDOUR, Elites training centrer Sfax - ANME, Tunisia)

Sunday, December 29, 2024

W4: Green Hydrogen and Fuel Cells Applied to Electric Vehicles

This workshop will cover the various types of hydrogen production (grey, blue, and green) along with methods for storage and applications in powering fuel cells (FCs) for light-duty electric vehicles (FCEVs). Participants will be introduced to two types of fuel cells: proton electrolyte membrane fuel cell (PEMFC) and solid oxide fuel cell (SOFC). Simulations will be carried out using Matlab Simulink and Homer.

08:45am-09:30am	Green Hydrogen status report in Tunisia (Fathi HAMAD, ANME, Tunisia)
09:30am-10:30am	Green Hydrogen and Fuel Cells Applied to Electric Vehicles (Adel AITOUCHE, CRIStAL-Junia, France)
10:30am-11:00am	Coffee break
11:00am-01:00pm	Green Hydrogen and Fuel Cells Applied to Electric Vehicles (Adel AITOUCHE, CRIStAL-Junia, France)
01:00pm-02:30pm	Lunch and Departure

Registration link:

https://forms.gle/mWdKptbHdXUS29416