



AT-SGIRE: Advanced Teaching and training on Smart grid and Grid Integration of Renewable Energy Systems

Stakeholders Training AGENDA

German Jordanian University

AT-SGIRE: *Advanced Teaching and training on Smart grid and Grid Integration of Renewable Energy Systems*

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AT-SGIRES: Advanced Teaching and training on Smart grid and Grid Integration of Renewable Energy Systems

Review table

Version	Date of Submission	Quality check		Technical check	
		Reviewer	Date	Reviewer	Date
V01	14.06.2020	Adib Allahham	19.06.2020	Adib Allahham	19.06.2020
V02	21.06.2020				

AT-SGIREs: Advanced Teaching and training on Smart grid and Grid Integration of Renewable Energy Systems

1.1 Training Description

This training covers technical characteristics of the smart grid, developing smart grids for a low-carbon future, microgrids and distributed energy future. The training will also consider the following topics:

- Innovative renewable energy sources,
- Introducing the concepts of various components of the smart grid, and smart generation (resources and potentials) including renewables energy resource (wind & solar), and energy storage systems,
- Substations in Smart Grids,
- Test technologies for the smart grid,
- Data acquisition systems for Smart Grids,
- Dispatching center and energy management in Smart Grids.

1.2 Learning Outcomes

At the end of the training, participants will be able to:

- Identify the critical elements of smart grids and visualize the roadmap towards next-gen electricity networks.
- Understand modern technologies and the smart grid challenges in distribution/transmission networks.
- Evaluate technology options about renewable energy generation, energy storage, data handling and for smart grids.
- Understanding of energy storage technology:
 - Know the testing standards of different technologies used in smart grid.
 - Know the vision and strategy for the electricity networks of the future.

1.3 Target groups and basic background

The training sessions are targeting the following groups: stakeholders in Jordan. For more details about the target group, please read the capacity building plan of AT-SGIREs project. The trainees must have the basic understanding of:

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- Power System,
- Power Electronics,
- Electrical network configuration,
- Preliminary knowledge of renewable technology systems integration, functioning and working principles.

1.4 Training Material

- Basics module Part I (UNEW module) and Part II (GJU module).

1.5 Additional References

1. Mah, Daphne, et al., eds. Smart grid applications and developments. Springer, 2014.
2. Huang, Qi, et al. Innovative testing and measurement solutions for smart grid. John Wiley & Sons, 2015.
3. Buchholz, Bernd M., and Zbigniew Styczynski. Smart grids-fundamentals and technologies in electricity networks. Vol. 396. Heidelberg: Springer, 2014.
4. Migliavacca, Gianluigi, ed. Advanced technologies for future transmission grids. Springer Science & Business Media, 2012.
5. Thomas, Mini S., and John Douglas McDonald. Power system SCADA and smart grids. CRC press, 2015.
6. Liu, Xue, and Fanxin Kong. "Datacenter power management in smart grids." Foundations and Trends® in Electronic Design Automation 9.1 (2015): 1-98.
7. Michaelides, Efstathios E. Stathis. Alternative energy sources. Springer Science & Business Media, 2012.

1.6 Proposed Trainers

1. Dr. Adib Allahham (University of Newcastle)
2. Dr. Hani Muhsen (German Jordanian University)
3. Dr. Jumana Alshawawreh (Technical Tafila University)
4. Dr. Samer As'ad (Middle East University)

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1.7 Agenda of Workshop Session of Stakeholders

Day 1

11 November, 2020

Seminar Room: German Jordanian University, Amman
Activity Hall, Building F

Start Time	Stop Time	Duration (hours)	Content
09:00	09:30	0:30	Registration
09:30	10:00	0:30	Welcoming (Prof. Alaaldeen Al-Halhouli)
10:00	11:00	1:00	Smart Grid Overview (Dr. Hani Muhsen)
11:00	12:00	1:00	Technical Characteristics of Smart Grid (Dr. Jumana Alshawawreh)
12:00	12:30	0:30	Coffee break
12:30	13:15	0:45	Pillars of Smart Distribution (Dr. Adib Allahham)
13:15	14:00	0:45	Smart Generation - Resources and Potentials (Dr. Samer As'ad)
14:00	15:00	1:00	Lunch Time
15:00	16:00	1:00	Energy Storage Systems (Dr. Samer As'ad)
16:00	16:30	0:30	Workshop closing and evaluation

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Day 2

12 November, 2020

Seminar Room: German Jordanian University, Amman
Activity Hall, Building F

Start Time	Stop Time	Duration (hours)	Content
09:00	09:30	0:30	Registration
09:30	10:00	0:30	Substations in Smart Grids (Dr. Jumana Alshawawreh)
10:00	11:00	1:00	Current Test Technologies for Smart Grid (Dr. Hani Muhsen)
11:00	12:00	1:00	Data acquisition systems for Smart Grids (Dr. Adib Allahham)
12:00	12:30	0:30	Coffee break
12:30	13:15	0:45	Dispatching center and energy management in Smart Grids (Dr. Jumana Alshawawreh)
13:15	14:00	0:45	Active Network Management (Dr. Hani Muhsen)
14:00	15:00	1:00	Lunch Time
15:00	16:00	1:00	Hardware-in-Loop (HIL) Simulation for testing Smart Grids (Dr. Adib Allahham)
16:00	16:30	0:30	Workshop closing and evaluation