AAF ALGERIAN AMERICAN FOUNDATION
for Culture, Education, Science and Technology

Smart Grids Program

1-Program Coordinators:

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2-Program Description:

Regulation, economics, environment are key factors in the drastic changes in the production, distribution and operation of electric power systems. Advances in power electronics and communication, and emphasis on renewable energy and electric vehicles, as well as consumer participation in both production and consumption of electricity are the major drivers in making the power system a **Smart Grid.** The objective of this course is to present the state of the art in smart grids from basic background to case studies. Participants are also encouraged to present posters on their related activities and interact with the instructors. Some of the topics that will be presented are:

- Smart Grid Basics and Issues
- Technical Issues
- Renewable Energy and Storage
- Electric Vehicles
- Operation and Architectures
- Cyber Security
- Poster Presentations and Open Discussions

Algeria has plans to exploit solar and wind energy. Integration of these resources with the current grid is certainly and important issue that this course will address. Several researchers at Algerian universities are pursuing similar activities and this proposed course will be a forum to exchange ideas which might lead to collaboration in both research and teaching.

3-Covered topics:

This program is broad and will cover basic concepts, advanced techniques and most recent scientific and technological achievements in the field.

The main topics of the program will include:

- Smart Grid Overview
- Power System Basics
- Distributed Energy Resources, Intermittent Resources
- Voltage/Var Technical Issues
- Power Quality, disturbances monitoring using advanced signal processing techniques
- Disturbance classification, voltage sag and swell signatures
- Communication Cybersecurity
- Storage
- Vehicles to Grid: V2G
- Smart Buildings
- Impact of High PV Penetration on Power System Operation - a Case Study
- Energy Storage Systems in the Residential Sector - A Case Study
- Microgrids – a Case Study
- Participants Posters and Discussions

4-Desired Learning Outcomes:

Participants will be exposed to the latest technologies and learn theoretical and practical knowledge on diverse relevant aspects of smart grid issues, solutions and case studies.

Instructors will guide and assist participants, working in academia and research centres to develop their skills, establish working relationships and build partnerships for future collaborative projects between Algerians abroad and Algerians at home.

5-Who Should Attend the Course?

Faculty members and graduate students in the field of electric power systems, engineers, economists, information technology personnel who deal with any aspects of smart grid design, planning and operation.

Sonelgaz and other energy companies could also benefit from this course