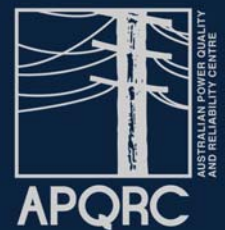


# 2020 Continuing Professional Development Courses



**THE AUSTRALIAN POWER QUALITY & RELIABILITY CENTRE IS OFFERING THE FOLLOWING CONTINUING PROFESSIONAL DEVELOPMENT COURSES IN 2019:**

- **RENEWABLE ENERGY GENERATOR CONNECTION**
  - **BRISBANE 12-13 MARCH 2020**
  
- **RENEWABLE & DISTRIBUTED GENERATION**
  - **SYDNEY 2-3 APRIL 2020**
  
- **INTRODUCTION TO QUALITY OF ELECTRICAL SUPPLY**
  - **WOLLONGONG 30 APRIL - 1 MAY 2020**
  - **MELBOURNE 7-8 MAY 2020**
  
- **BATTERY ENERGY STORAGE**
  - **WOLLONGONG 14-15 MAY 2020**
  
- **ADVANCED QUALITY OF ELECTRICAL SUPPLY**
  - **MELBOURNE 2-3 JULY 2020**
  - **WOLLONGONG 10-11 SEPTEMBER 2020**
  
- **POWER QUALITY WITH A FOCUS ON RENEWABLE ENERGY**
  - **BRISBANE 13-14 AUGUST 2020**
  
- **SOLAR PV ENERGY SYSTEMS**
  - **MELBOURNE 27-28 AUGUST 2020**
  
- **FUNDAMENTALS OF POWER SYSTEMS**
  - **SYDNEY 20-21 AUGUST 2020**
  - **MELBOURNE 5-6 NOVEMBER 2020**
  
- **PSCAD TECHNICAL WORKSHOP - EMT STUDIES INCLUDING SUPPORT TO RENEWABLE INTEGRATION**
  - **BRISBANE DATES TO BE ADVISED**
  - **SYDNEY DATES TO BE ADVISED**
  
- **PSCAD TECHNICAL WORKSHOP - ESSENTIALS OF ELECTROMAGNETIC TRANSIENT SIMULATION FOR POWER SYSTEM STUDIES**
  - **WOLLONGONG DATES TO BE ADVISED**



**UNIVERSITY  
OF WOLLONGONG  
AUSTRALIA**

## **CUSTOMISED IN-HOUSE COURSES AVAILABLE**

We can come to you to provide customised courses on a range of topics at your location.

## **ENQUIRIES**

For more information, contact Ms Raina Lewis, University of Wollongong.  
Phone: (02) 4221 3335      Email: [raina\\_lewis@uow.edu.au](mailto:raina_lewis@uow.edu.au)



## **TRAINING INVESTMENT**

The course investment provides for an inclusive industry related training package with course notes, lunches and morning and afternoon tea. Participants may count course hours towards their CPD requirements

## **INTRODUCTION TO QUALITY OF ELECTRICAL SUPPLY**

**30 APRIL-1 MAY 2020 (WOLLONGONG) AND 7-8 MAY 2020 (MELBOURNE)**

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### **COURSE BENEFITS**

Following the course you will have gained the following knowledge and skills:

- A systematic understanding of the various power quality disturbances and the types of load affected.
- Knowledge of the standards for particular types of disturbances and actions to take if limits are exceeded.
- Distinguishing the different types of available power quality monitoring equipment and their particular applications.
- Knowledge of how utilities and customers can improve their power quality.

### **WHO SHOULD ATTEND?**

This introductory course is suitable for all individuals working in the electrical power engineering industry. This includes managers, utility specialists and technical staff who wish to advise customers on power quality concerns, or who service large customers or who wish to understand aspects of network design, construction and maintenance techniques for maximising quality of supply.

## **RENEWABLE ENERGY GENERATOR CONNECTION 12-13 MARCH 2020 (BRISBANE)**

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### **COURSE BENEFITS**

Transformations in the Australian electricity network prompted the Australian Energy Market Operator (AEMO) to revise pre-connection study requirements for new generators connecting to the network increasing the complexity of the process. Implementation of the NER and AEMO's system strength impact assessment and modelling guidelines has introduced significant challenges for networks, proponents and consultants related to the acquisition, analysis and use of generator and network modelling data and performing the required pre-connection studies. This course will provide a detailed overview of the modelling and simulation requirements of large asynchronous generators connecting to weak networks, prompting the most onerous of connection processes.

The course will cover a number of topics related to the connection of renewable energy generators including modelling techniques. Preliminary and full impact assessments will be investigated using real-world indicative examples and simulation outcomes. Delegates will also learn the importance of detailed modelling techniques, the data that is required and how it is implemented in relation to connecting generators meeting their technical performance requirements

### **WHO SHOULD ATTEND?**

This course is designed to assist individuals directly involved in the process of connecting renewable energy generators.

## **RENEWABLE & DISTRIBUTED GENERATION 2-3 APRIL 2020 (SYDNEY)**

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### **COURSE BENEFITS**

By attending the course, you will gain knowledge and skills to assist you to:

- Appreciate different renewable and distributed generation resources, their operation, and functional aspects
- Gain an understanding of the impact of different renewable and distributed generation resources on electricity networks
- Gain knowledge of guidelines and standards for integration of these new energy resources into electricity grids
- Become aware of the design of interfaces for different types of renewable energy resources
- Gain a practical understanding of various power quality problems associated with renewable and distributed generation
- Gain knowledge of how to accommodate these devices economically without violating network constraints

### **WHO SHOULD ATTEND?**

Managers, utility specialists and technical staff who wish to advise customers on renewable energy integration, or who provide services to large clients, or those who wish to understand aspects of network design, construction and maintenance techniques for maximising renewable energy penetration.

## **BATTERY ENERGY STORAGE 14-15 MAY 2020 (WOLLONGONG)**

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### **COURSE BENEFITS**

By attending the course, you will gain knowledge and skills to assist you to:

- Appreciate the different battery energy storage technologies and their relative advantages and disadvantages
- Have a systematic understanding of the capabilities of battery energy storage systems and how they should be designed
- Understand battery management systems and their importance
- Gain knowledge of guidelines and standards for integration of energy storage systems into electricity grids
- Gain a practical understanding of various power quality problems associated with energy storage systems

### **WHO SHOULD ATTEND?**

Any individual who is interested or requires better understanding of the capabilities of battery energy storage systems, their advantages and disadvantages and how they can best be integrated into the electricity networks of the future

## **ADVANCED QUALITY OF ELECTRICAL SUPPLY**

**2-3 JULY 2020 (MELBOURNE) AND 10-11 SEPTEMBER 2020 (WOLLONGONG)**

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### **COURSE BENEFITS**

Following the course, participants will be able to:

- Calculate harmonic distortion levels, apply standards for harmonics and assess the effectiveness of mitigation methods.
- Calculate unbalance factors, understand the effects of unbalance on loads and appreciate unbalance standards
- Determine sag characteristics at a site and assess for sag mitigation strategies
- Understand how power electronic devices can be used to mitigate harmonics, unbalance and sags
- Better understand power quality monitoring methodologies

### **WHO SHOULD ATTEND?**

This advanced course is designed for utility specialists, consultants, engineers and senior technical staff who wish to advise customers on power quality concerns, or who service large customers or who wish to understand aspects of network design, construction and maintenance techniques for maximising quality of supply.

## **POWER QUALITY WITH A FOCUS ON RENEWABLE ENERGY 13-14 AUGUST 2020 (BRISBANE)**

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### **COURSE BENEFITS**

By attending the course, you will gain knowledge and skills to assist you to:

- Gain a systematic understanding of the various power quality disturbances, including their causes and the types of loads affected.
- Familiarise yourself with the standards for particular types of disturbances and mitigation strategies if standard limits are exceeded.
- Distinguish the different types of available power quality monitoring equipment and their particular applications.
- Appreciate different renewable and distributed generation resources, their operation, and functional aspects;
- Gain a systematic understanding of the impact of different renewable and distributed generation resources on electricity network operation, control and protection
- Gain knowledge of guidelines and standards for integration of renewable energy resources into electricity grids
- Have a systematic understanding of the capabilities of battery energy storage systems and how they should be designed
- Gain knowledge of guidelines and standards for integration of energy storage systems into electricity grids

### **WHO SHOULD ATTEND?**

Managers, utility specialists and technical staff who wish to advise customers on renewable energy integration, or who provide services to large clients, or those who wish to understand aspects of network design, construction and maintenance techniques for maximising renewable energy penetration.

Graduates, end-users or personnel working in all areas of power system design want to understand how the system interacts with distributed generation, will also benefit from attending this course.

## **SOLAR PV ENERGY SYSTEMS 27-28 AUGUST 2020 (MELBOURNE)**

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### **COURSE BENEFITS**

The course will cover all areas of solar PV energy generation and network integration including:

- Solar PV cell technology
- Solar inverter technology
- Standards related to the integration of solar PV
- Solar PV network integration

### **WHO SHOULD ATTEND**

The course is designed for engineers, technical officers and other staff working in areas where solar PV generation systems are of interest. No prior knowledge is required.

## **FUNDAMENTALS OF POWER SYSTEMS**

**20-21 AUGUST 2020 (SYDNEY) AND 5-6 NOVEMBER 2020 (MELBOURNE)**

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### **COURSE BENEFITS**

This course will provide an introduction to electrical power distribution systems. Topics that will be covered include: the building blocks of electrical power systems, power system components including their function and operating principles and basic power system circuit theory.

### **WHO SHOULD ATTEND**

This course is ideal for individuals transitioning into the electrical engineering space and/or electrical engineers seeking a refresher course. Rather than being highly mathematical, the course is designed to give participants an overview of the important components and aspects of power system operation.

## **PSCAD TECHNICAL WORKSHOP - EMT STUDIES INCLUDING SUPPORT TO RENEWABLE INTEGRATION (BRISBANE AND SYDNEY)**

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### **COURSE BENEFITS**

This three-day course is delivered by the engineering team from Manitoba Hydro International Ltd. (MHI), Canada in conjunction with the Australian Power Quality and Reliability Centre (APQRC) of the University of Wollongong, Australia. It is intended for practicing engineers in power systems working in utilities, manufacturing, consulting, and academia who are interested in developing an in-depth understanding of the modern tools available for electromagnetic transient studies. Practical examples, based on the extensive experience of the staff at MHI will be specifically presented to provide a practical aspect to the course topics

## **PSCAD TECHNICAL WORKSHOP - ESSENTIALS OF ELECTROMAGNETIC TRANSIENT SIMULATION FOR POWER SYSTEM STUDIES (WOLLONGONG)**

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### **COURSE BENEFITS**

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## **ENQUIRIES**

Please call **Ms Raina Lewis** at the Australian Power Quality and Reliability Centre, University of Wollongong  
Phone: (02) 4221 3335 Email: [raina-lewis@uow.edu.au](mailto:raina-lewis@uow.edu.au)  
<http://www.elec.uow.edu.au/apqrc/>