POWER AND ENERGY SOCIETY
INDUSTRY APPLICATIONS SOCIETY
NEW YORK CHAPTER
2016

Electrical Power System Engineering Methods

Name of Course: Electrical Power System Engineering Methods.
Dates: Thursdays, April 14, 2016 to June 2, 2016
Place: Parsons Brinckerhoff, One Penn Plaza, New York NY 10119
Time: 6:00 PM to 8:00 PM
Contact: Thomas Li, PE: Chairman: Education Committee: Thomas.Li@Jacobs.com (212) 946-2333
Chris Kwong, PE: Vice-Chair: PES & IAS NY Chapter: Chris.Kwong@Jacobs.com (212) 946-2334
Arnold Wong: Chairman: Program Committee: WONGAR@ConEd.com (212) 460-4189

Cost:

1.	IEEE Member:	$350.00;	Two or more:	$300.00
2.	Non-Member:	$450.00,	Two or more:	$400.00
3.	IEEE Student Member:	$50.00	Non-IEEE Student Member:	$150.00

Course Duration: 8 weeks Lecture Hours: 2.00 hours / week; 2 PDH / 0.2 CEUs; Total 16 PDH / 1.6 CEU

Instructor: Geradino A. Pete, PE
President Vector Engineering Services Corporation

Reserve Now: **Class size limited**. **Please make checks payable to: IEEE PES/IAS NY Chapter.**

Mail check for registration to: IEEE,
Arnold Wong
5 Fifth Place
Syosset, NY 11791

Course Description:
This course will be an advanced presentation of the material covered in the IEEE Power Systems 101 course and includes a detailed analysis of the components, concepts and design/code applications of electrical power systems. The participants will get a detailed presentation of the engineering principals associated with:

- Power system configuration including generation, transformation, transmission, subtransmission, primary and secondary distribution subsystems and customer loads.
- Power circuit impedance, voltage, current, frequency, and apparent, real and reactive power relationships under normal, overload and fault conditions.
- Power circuit configuration including single-phase and three-phase and wye and delta connections.
- Overvoltage and insulation coordination.
- Undervoltage and power transfer capacity.
- Voltage and reactive power control including generator excitation, synchronous condensors, shunt reactor and capacitor banks, transformer tap changers and line charging.
- Transformer theory including wye and delta transformations, three-winding transformers, power, voltage-regulating and phase angle-regulating applications, neutral grounding transformers, voltage, current and auxiliary transformers and saturation considerations.
- Symmetrical versus asymmetrical current.
- Fundamentals of system protection.
- Symmetrical components.
- Transmission line protection including non-directional and directional overcurrent and distance protection, phase and ground protection, and zero sequence mutual compensation.
- Generator theory including prime movers, real and reactive power mechanisms of electric generators, synchronous and induction generators and motors, generator capability curves, steady-state, transient and subtransient current.

- Generator protection including phase and ground fault protection, loss of excitation, loss of synchronism, directional and non-directional overcurrent protection, reverse power, negative sequence protection, overload, overspeed and overvoltage protection.
- Grounding theory and design including touch-and-step criteria, ground resistance and ground resistivity measurements, ground grid design, ground protective relay coordination, effect of surface material, criteria for tolerable voltage, transferred potentials, ground electrodes, ground mat and ground grid design.

Who should attend?

- Students studying Electrical Engineering.
- Engineers new to the field or with limited experience.
- Experienced engineers seeking an overview of the contemporary electrical power systems.
- Managers and supervisors without previous experience in electrical power systems.
- Electricians, Technicians, Installers and Field Personnel seeking overview of electrical power systems.
- Engineers seeking to obtain continuing education credits to satisfy New York State's re- registration requirements for professional engineers.

Requirements:
Quizzes/Tests and home work will be given at the discretion of the instructor. A certificate of completion will be given to all participants who successfully complete the course. For partial attendance, a certificate for the attended day-course/s with its PDH/CEU's will be issued.

NOTE: If an attendee cannot attend a particular session, another person can attend from the same company.

Required Reference Book:
Electric Power Systems for Engineers and Technicians,
Geradino A, Pete, PE, included in the course material (pdf file only, participant to print their own copy if desired).

Suggested Text:
Westinghouse Electrical Transmission and Distribution Reference Book, Westinghouse Central Station Engineers, 1965.

NOTE: If an attendee cannot attend a particular session, another person from the same company can attend.

COURSE OUTLINE SCHEDULE

Lesson	Subject
1.	Electric Power Systems Engineering Principles
2.	Transformers and Transformer Connections
3.	System Protection Schemes
4.	Transmission Line and Substation Protection
5.	Generating Sources and Sources
6.	Generator Protection
7.	Grounding
8.	Power System Studies