

Who Should Attend?

Facilities and Project Engineers as well as new Electrical, Instrumentation or Controls Engineers who need to improve their basic understanding of electrical systems within oil and gas facilities.

The Participant Will Learn:

- The key components of facilities electric power distribution which include circuit arrangements, wiring, cabling, terminations, conduit, low voltage boards, low and medium voltage switchgear, and single-phase and three phase schemes
- Operation, components, electromotive forces, turns and voltage ratios, losses, efficiency, rating, and connections of transformers
- The difference between direct current motors, alternating current motors, enclosures and how to select motors
- Protection including fuses, direct tripping, relaying, and coordination
- About emergency power to include power requirements, generator sets, direct current systems, batteries, and an overview of uninterruptible power supplies (UPS)
- Power generation which includes an overview of emergency, prime, base, peak and co-generation, quality, sizing, operation, control, and power factor correction
- Grounding and bonding with an overview of systems, equipment, ignition sources, separately derived systems, performance, and substation grounding
- Hazardous areas with general information on classifications, NEC, IEC, equipment protection, certification, and definitions

All classes available at your location. Contact us today.

www.jmcampbell.com | 1.405.321.1383

Electrical Engineering Fundamentals for Facilities Engineers (E-3)		
Course Outline		Daily schedule is approximate.
DAY 1	CONCEPTS <ul style="list-style-type: none"> • Introduction to electrical systems and documentation • Group project • Red Thread Exercise 1 • Develop basic one line diagram • Fundamentals of Electricity • Basic DC & AC Circuits 	<ul style="list-style-type: none"> • Fundamentals of Electricity • Basic DC Circuits, Exercise 2 • Ohms Law and cable voltage drop, Exercise 3 • Power Conversion and efficiency • Fundamentals of Electricity • AC Circuits
DAY 2	CONCEPTS <ul style="list-style-type: none"> • Power Distribution, Exercise 4 • Determine System Voltage required, Exercise 5 • Redundancy • Power Generation, Exercise 6 	<ul style="list-style-type: none"> • Generator Determination • Emergency Power, Exercise 7 • Emergency Power System
DAY 3	CONCEPTS <ul style="list-style-type: none"> • Transformers, Exercise 8 • Size Transformer, Motors, Exercise 9 • Motor Troubleshooting, Exercise 9 	<ul style="list-style-type: none"> • Motor Troubleshooting, Exercise 10 • Determine Cable and Starter Size
DAY 4	CONCEPTS <ul style="list-style-type: none"> • Electrical Equipment Protection, Exercise 11 • Determine Short Current, Exercise 11 • Determine Short Current, Exercise 12 • Select Protection Scheme 	<ul style="list-style-type: none"> • Hazardous Area Classifications, Exercise 13 • Determine Area Classification • Grounding & Bonding, Exercise 14 • Grounding Puzzle
DAY 5	CONCEPTS <ul style="list-style-type: none"> • Electrical Safety, Exercise 15 • Electrical Safety Puzzle • Programmable Electronic Systems (PES), Exercise 16 • Course Review and Summary 	<ul style="list-style-type: none"> • Cause & Effect Development • Adjustable Speed Drives (ASD, VFD, or VSD), Review Test

About the Course:

This course applies fundamental electrical engineering principles to oil and gas facilities design and operation. The course is designed for Facilities Engineers with or without a background in electrical engineering and can accelerate the development of new Facilities Electrical Engineers. Through the use of individual and group problem solving, attendees will learn about transformers, motors, generators, one-line diagram interpretation, protection and coordination of electrical equipment, emergency power, direct current systems, uninterruptible power supplies, site and standby generation, variable speed drives, programmable electronic systems, electrical safety, grounding and bonding, lighting, and hazardous areas. Participants will gain a better understanding of electrical components and systems and will develop a greater appreciation for electrical engineering.