

SPWG 171: ADVANCED POWER SYSTEMS CONTROLS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2021
Credits:	4
Total Contact Hours:	108
Lecture Hours :	54
Lab Hours:	54
Hours Arranged:	0
Outside of Class Hours:	108
Prerequisite:	SPWG 170A by department consent based off of experience and/or industry certification.
Transferable to CSU:	Yes
Transferable to UC:	No
Grading Method:	Standard Letter, Pass/No Pass

Catalog Course Description

This course is intended for the diesel technology student intending to pursue a career in stationary power generation maintenance and repair. The last course in the series for Power Generation, this course will provide a basic overview of ATS components and operations. This course will provide a background in UPS battery systems as well as flywheel energy storage systems. This course will prepare students for the EGSA or CEP certifications. 54 lecture hours, 54 lab hours.

Course Objectives

- Identify Automatic Transfer Switch (ATS) functions, device options, and operations.
- Identify and implement switchgear start-up design drawings and operator's manual instructions for maintenance and repair of switchgears.
- Demonstrate knowledge of installation, operation and service of Flywheel UPS systems.
- Perform paralleling, tuning and troubleshooting of engine generators.
- Identify XLM, LM, and EPG Switchgear operation and repair procedures.

Major Course Content

- UPS systems
 - Define common UPS system industry terms
 - Identify UPS product line
 - Understanding major power disturbances and how the UPS deals with these power problems
 - Installation, operation and service of UPS systems
- Flywheel energy storage systems
 - Common Flywheel system industry terms
 - Identify Flywheel product line
 - Understanding major power disturbances and how the Flywheel deals with these power problems
 - Installation, operation and service of flywheel systems

- UPS Battery
 - Learn and define common Battery bank system industry terms
 - Identify Battery bank product line and system set up
 - Understanding major power disturbances and how the UPS battery systems deals with these power problems.
- Installation, operation and service of UPS battery systems
- Testing and maintaining system batteries in information technology centers, power plants, and other systems that require DC power

Lab Content

- Flywheel
 - Installation, start-up, maintenance and repairs of UPS Flywheel
 - Commissioning of flywheel system to load demand
 - Identify system components and parts placement
 - Interpret schematics for SMS and MMS UPS flywheel systems
 - Troubleshooting flywheel systems
 - Configure flywheel UPS remote monitoring and notification capabilities
 - Install UPS View software for system programming, diagnosis and file management
- UPS Battery
 - Identify symbols and components utilized in (Battery) UPS system
 - Identify features, ratings and common configuration for UPS systems
 - Identify system components and parts placement
 - Troubleshooting UPS battery systems
 - Double Conversion UPSB
 - Identify Vented Lead-Acid (VLA) and Valve Regulated Lead-Acid (VRLA) types of batteries and their operating principles & parameters.
- Manufacturer's installation and operating instruction guidelines and applicable regulatory standards to develop a correct battery/cell inspection form for battery life trending
- Identify and correctly use various types of test equipment and hand tools required to install and maintain batteries.

Suggested Reading Other Than Required Textbook

LP030 UPS Flywheel Student Battery Conductance Reference Value Chart
Testing and Adjusting Vacuum Pump

Examples of Outside Assignments

UPS Battery Backup Calculator

Instruction Type(s)

Lecture, Lab