



Power and Drives

ENGRTEC 4600

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Lab

Course Description:

ENGRTEC 4600, Power and Drives, is a 3-hour course designed to introduce the student to high-voltage power generation/transmission to production facilities and distribution within the facility. Further the course will focus on applications related to motors and variable frequency drives. Applications for power (12,000 volts to 120 volts) are found in typical production facilities.

Prerequisites and Co-requisites:

Prereq: 2300.

Course Goals / Objectives:

- Students will have a basic understanding of how power is generated and transmitted from the generator to a facility (transmission) and throughout the facility (distribution)
 - Students will understand components of power
 - Students will understand the purpose and important functions of power distribution components in a typical manufacturing facility
 - Students will have a basic understanding of motors
 - Students will understand the concept and design of single speed motor control
 - Students will understand how variable frequency drives (VFD) are applied in motor control
 - Students will have an appreciation for industrial safety regulations
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Course Topics:

- Power generation, turbines, renewable energy
 - Phases, 3-phase power, power demand, transmission, transformers
 - Fuses, grounding
 - Circuit breakers, GFIC
 - Power/Energy, real power, horsepower
 - Reactive power, apparent power, power factor, load analysis
 - Switchgear, MCC
 - Single line diagrams, UPS, preventive maintenance
 - Synchronous motors, AC motors, DC motors
 - Motor starters, 3-phase electrical schematics, MCC components
 - Intro to VFDs, configuration of VFDs
 - VFD speed reference, VFD troubleshooting
 - Arc flash, Lock Out Tag Out
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Designation:

Required