

PWRP - POWER PLANT TECHNOLOGY

PWRP 201 Power Plant Equip & Optrns. 3 Credits

Provides the student with an introduction to the major systems and components that make up a modern power plant. Students learn how electric power is produced and distributed; how boilers, turbines, and condensers operate; and what the general responsibilities of plant operators are during all phases of plant operation. Specific attention is given to the flow of water and steam through the steam cycle, how combustion occurs, types of boilers and turbines, operation of steam cycle support systems, bearings and lubrication, turbine control, pollution control, and plant safety. This course covers the various types of equipment used in the production of electricity, including pumps, valves, air compressors, coal pulverizers, fans, cooling towers, condensers, and heat exchangers.

Lecture Hours 3

Department: Engineering & Industrial - COT

PWRP 203 Energy Sources & Conversion. 3 Credits

Allows students to study the various forms of energy and the processes used to convert chemical and potential energy into thermal, mechanical, and in some instances, electrical energy. Energy sources that will be studied include fossil fuels (coal, oil, and natural gas), hydro, wind, fuel cells, solar, derived fuel, geothermal, and nuclear. Combustion and reaction will be discussed in detail for those energy sources that require combustion to convert from one energy form to another.

Lecture Hours 3

Department: Engineering & Industrial - COT

PWRP 210 Turbines, Accessories & Bsc Op. 3 Credits

Prerequisite(s): PPT 135, PPT 175

This course also covers the safe and efficient operation of gas turbines and heat recovery steam generators and their different applications as used in combine cycle and cogeneration configurations. Students will learn how thermal energy is converted to mechanical energy as the steam passes through a typical industry steam turbine. Steam turbine start-up and shut-down procedures will also be studied.

Lecture Hours 3

Department: Engineering & Industrial - COT

PWRP 214 Power Generation. 4 Credits

Prerequisite(s): PPT 175.

Introduces the basic elements of generator design, protection, and operation. Students are introduced to the theoretical aspects of reactive power in power systems by analyzing the inductive and capacitive components of the system, with an emphasis on megavar loading as it is affected by the excitation system. The generator's auxiliary systems, including hydrogen cooling systems, stator cooling systems, seal oil systems, and generator degassing procedures, are also introduced and the function and types of exciters commonly found in power plants are examined.

Lecture Hours 4

Department: Engineering & Industrial - COT

PWRP 216 Elect Systm Cmpnts & Prctcns. 3 Credits

Prerequisite(s): PPT 175.

Introduces typical devices used to protect personnel and prevent damage to plant equipment. Also covered are generator, bus, and line differential protection, as well as high- and low-pressure protection. The material presented includes trip and alarm logic for chemical protection, turbine protection, boiler protection, and generator protection. Devices covered include fuses over current relays and over- and under-voltage relays. The course covers practices for electrical protection of plant equipment and personnel.

Lecture Hours 3

Department: Engineering & Industrial - COT

PWRP 218 Adv Plant Optrns & Trblshntng. 4 Credits

Prerequisite(s): PWRP 201.

Allows students to gain the knowledge necessary to comprehend overall power plant operations and respond to abnormal operating conditions. Students will also participate in root cause analysis exercises while troubleshooting different operating scenarios.

Lecture Hours 4

Department: Engineering & Industrial - COT

PWRP 296 Internship/Cooperative Educ. 2 Credits

(45 hours/credit) Provides students with the opportunity to supplement coursework with practical work experience related to their educational program. Students work under the immediate supervision of experienced personnel at the business location and with the direct guidance of the instructor.

Lecture Hours 2

Department: Engineering & Industrial - COT