

Process Power Plant Course Descriptions

PROP 102: Introduction to Process Technology (3)

This course is designed to provide an introduction to process plant operations including ethanol plants, chemical and refinery plants, natural gas facilities, gasification operations, combined cycle and food processing operations. Student is required to complete a tour of a process facility during this course. Equipment overviews and the initiation/maintenance of a career portfolio are components of this course.

ENTR PROP 103: Applied Math (3)

This course will teach basic math skills and apply those to energy industry situations. Students will learn the metric system, basic volume and area calculations as well as algebra and trigonometry and how they apply to industry specific situations.

ENTR PROP 105: Safety (3)

This course covers the personal protective equipment and proper safety work practices and procedures commonly used in the energy industry. Students will also gain a working knowledge of standard safety practices set by the Occupational Safety and Health Administration.

ENTR PROP 106: DC Fundamentals (2)

This course covers basic direct current theories and applies those theories to the electrical system and related equipment. Students will study methods of producing a voltage, such as batteries, magnetic fields, basic series and parallel circuits. Students will also study basic DC circuit calculations.

ENTR PROP 108: AC Fundamentals (3)

This course covers basic alternating current theories and applies those theories to electrical systems and related equipment. Students will also study basic generator and motor design, construction and operating principles.

PROP 201: Process Equipment (3)

This course is designed to provide the basic operating principles of equipment used in the process technology industry such as valves, piping, pumps, compressors, generators, motors, lubrication systems, heat exchangers, furnaces, boilers, cooling towers, separators, reactors and distillation columns. The mechanical design characteristics, scientific principles, and the interactions of the various pieces of plant equipment will be explored.

ENTR 112: Basic Print Reading (2)

This course covers schematics, prints, piping and instrument diagrams used in the energy industry. Students will learn how to interpret simple block and single-line diagrams, which will prepare them for the logic and electrical schematics included in this course.

ENTR 116: Instrumentation & Control (4)

This course provides a comprehensive look and study of instrumentation components, control theory, control systems and typical controllers associated with the operation of energy facilities.

ENTR 118: Thermodynamics (3)

Students enrolled in this course will study heat transfer, fluid flow and the conservation of energy. Specific equipment design considerations based on thermodynamic principles will be covered.

ENTR 120: Water Purification & Treatment (2)

This course covers industrial water treatment processes. Students will study boiler water treatment, raw water treatment, and the design and operation of ion exchangers. The course also covers cooling water treatment equipment and waste water treatment equipment and systems.

PROP 216: Process Boilers (2)

This course provides a comprehensive study of industrial manufacturing plant boilers and furnaces, and supporting auxiliary systems. Students will study typical process plant boiler, oxidizer and furnace types, their operation, safe firing theory, troubleshooting techniques, and typical maintenance.

PROP 235: Hydrocarbon Chemistry (3)

This course provides a fundamental study of the organic chemistry of hydrocarbons associated with crude oil. This course will also focus on process chemistry, chemistry fundamentals, typical process reactions and process solubility theory.

PROP 237: Distillation & Refinery Operations (4)

This course provides a comprehensive study of processes associated with refining, and petrochemical distillation. This course will also focus on equipment designs, operation requirements and technician responsibilities associated with the operation of typical distillation facilities.

PROP 239: Gas Processing (3)

This course provides a comprehensive study of the processing technologies associated with the production of natural gas and other gases found within natural gas fields. Students will study gas laws, molecular structure, process theory, terminology, equipment and the auxiliary systems which support the production and processing of gases.

PROP 244: Ethanol & Bio-Fuels Production (4)

Students enrolled in this course will study the design, operation, equipment and process flows of ethanol plants and bio-fuels facilities including biodiesel plants. The student will have the ability to interpret basic flow diagrams and understand related

terminology. The equipment design and operation used in these facilities will be a focus as well as safety considerations, typical maintenance, and startup/shutdown procedures.

PROP 212: Auxiliary Systems & Refrigeration (3)

This course provides a comprehensive study of industrial manufacturing plant auxiliary systems, including fluid power, piping and piping systems, pumps and pump drive systems, compressors and fan systems, refrigeration, and hydraulic systems, but not restricted to these components.

PROP 218: Process Operations & Troubleshooting (3)

This course is designed to provide instruction in the different types of troubleshooting techniques, procedures, and methods used to solve process problems. Students will use existing knowledge of equipment, systems, and instrumentation to understand the operation of an entire unit in a facility. Students study concepts related to commissioning, normal startup, normal operations, normal shutdown, turnarounds, and abnormal situations, as well as the Process Technician's individual and team role in performing tasks associated with these concepts within an operating unit.

ENTR 220: Practical Applications (2)

Students will participate in hands-on lab activities, internships or industry job shadowing to gain entry-level job competencies.