PROCESS TECHNOLOGY (PRT)

PRT F101  Introduction to Process Technology
3 Credits
Introduction to process operations in industry. Non-mathematical overview of general information, processes, procedures and equipment a process operator would be expected to know and use.
Lecture + Lab + Other: 3 + 0 + 0

PRT F110  Introduction to Occupational Safety, Health and Environmental Awareness
3 Credits
Overview of the field of safety, health and environment within the process industry. Covers plant hazards, safety, and environmental systems and equipment, and applicable government regulations and industry standards.
Lecture + Lab + Other: 3 + 0 + 0

PRT F117  Drafting for Technicians
3 Credits
Offered As Demand Warrants
Skills and techniques needed to produce process piping and instrumentation drawings.
Lecture + Lab + Other: 2 + 2 + 0

PRT F120  Water Quality Management for Process Industries
4 Credits
Offered As Demand Warrants
Overview of the chemistry, biology, hydraulics and hydrology related to water management in industries. Water distribution systems, water processing, operation of water works, wastewater processing, advanced wastewater treatment and water reuse.
Lecture + Lab + Other: 3 + 3 + 0

PRT F130  Process Technology I: Equipment
4 Credits
Selected process equipment including rotating machinery and process units. Emphasis on equipment components, construction, preventative maintenance and safety. Includes hands-on experience.
Prerequisites: PRT F101.
Lecture + Lab + Other: 3 + 2 + 0

PRT F135  Stationary Equipment
4 Credits
Offered Fall
A detailed hands-on lecture/lab course covering stationary equipment used in a variety of process industries. Piping, valves, vessels, tanks, exchangers, heaters, boilers, mineral processing, mill equipment and distillation equipment are covered.
Lecture + Lab + Other: 3 + 2 + 0

PRT F140  Industrial Process Instrumentation I
3 Credits
Physics of pressure, temperature, level and flow measurement; mechanical and electrical aspects of instruments used to control dynamics of processes. Dynamics of automatic control including proportional control, automatic reset, derivative action and integral timing.
Prerequisites: DEV M105 or higher; or permission of instructor.
Lecture + Lab + Other: 2 + 2 + 0

PRT F144  Industrial Process Instrumentation II
3 Credits
Continuation of PRT F140. Emphasis on repair, maintenance and calibration, including hands-on physical training on a wide variety of process instruments.
Prerequisites: PRT F140.
Lecture + Lab + Other: 2 + 2 + 0

PRT F160  Oil and Gas Exploration and Production I
3 Credits
Surveys oil and gas exploration and production issues including marketing, geology, reservoir economics, legal aspects of resource ownership, drilling and production technologies, product separation, safety and environmental issues. Course may not be audited.
Prerequisites: Must be enrolled in the PRT program or permission of Program Chair.
Lecture + Lab + Other: 3 + 0 + 0

PRT F230  Process Technology II: Systems
4 Credits
Integration of equipment concepts to show how the individual components interact as part of a system and how each system works within an entire processing facility. Emphasis on the common systems found in each Alaska process industry. Systems topics include upstream oil and gas productions, petrochemicals and refinery processes, refrigeration, power generation, milling, boilers and heaters, coolers and heat exchangers.
Prerequisites: PRT F130.
Lecture + Lab + Other: 3 + 2 + 0

PRT F231  Process Technology III: Operations
4 Credits
Duties and responsibilities of the process operator on the job. Includes the details of normal operation, upset conditions, emergency action plans, startups, shutdowns, operating modes, turnarounds and routing maintenance activity.
Prerequisites: PRT F230.
Lecture + Lab + Other: 3 + 2 + 0

PRT F240  Industrial Process Instrumentation III
3 Credits
Offered As Demand Warrants
A study of digital and analog industrial measurement and control instrumentation, including continuous analog control loops, relay logic and programmable logic controllers. Emphasis is on commonly used process measurement devices, control methods and strategies, and the proper selection, identification, design, installation and operation of instrumentation.
Prerequisites: PRT F140; PRT F144; or permission of instructor.
Recommended: MATH F113X or higher.
Lecture + Lab + Other: 2 + 2 + 0
PRT F248  Valve Maintenance and Instrumentation  
3 Credits  
Offered As Demand Warrants  
Specific advanced subjects of industrial process valve maintenance and instrumentation. Includes calibration, configuration, troubleshooting, and use of valves with instrumentation. Concepts of contemporary plant control systems, commonly used industrial process measurement, control communication protocols and topologies related to valve control will be discussed. Covers maintenance and operation of gate, globe, ball, plug, check and special-purpose valves. Details of actuators and various accessories related to valve maintenance and control will be explained and related to valve selection based on application.  
**Recommended:** PRT F130.  
**Lecture + Lab + Other:** 3 + 1 + 0

PRT F250  Process Troubleshooting  
3 Credits  
Troubleshooting process operations and problems. Using indicators, variables and controllers along with a formalized process of troubleshooting. Troubleshooting examples will reflect current needs of industry.  
**Prerequisites:** PRT F230  
**Lecture + Lab + Other:** 3 + 0 + 0

PRT F255  Quality Concepts for the Process Industry  
1 Credit  
Introduction to current quality concepts applied to role of process technician. Includes quality concepts with respect to the client and the role of statistical processes used by the operator in achieving quality.  
**Lecture + Lab + Other:** 1 + 0 + 0

PRT F275  Process Technology Internship  
1-9 Credits  
Offered As Demand Warrants  
Working experience in and exposure to various stages and settings within the process industry. Endorsed and promoted by Alaska Process Industry Careers Consortium, the internship is an intensive exposure to the various duties and responsibilities of the process operator in Alaska. A maximum of 9 credits may be earned.  
**Prerequisites:** Permission of instructor.  
**Recommended:** PRT F101, PRT F110, PRT F140.  
**Lecture + Lab + Other:** 0 + 5.45 + 0