

## Course Descriptions

### Process Technology

#### **PTEC 1113 Introduction to Process Technology**

Introduction to process operations in the petrochemical industry including: operator roles, responsibilities and expectations; plant terminology; safety and environmental responsibilities; applied organic and inorganic chemistry; applied physics; plant equipment, utility systems; product handling; flow diagrams; general process overviews; basics of process control; and plant organizations. This course will expose students to an overview of the Process Technology associate degree program, including the mental and physical requirements of the Process Technician career. Plant tours will be conducted.

#### **PTEC 1124 Process Troubleshooting**

This course utilizes heat, mass and energy balances and operating data to identify and correct process abnormalities using techniques such as “cause and effect” and “root cause” analysis. Students will acquire and develop troubleshooting techniques associated with petrochemical processes through group exercises in a work team environment.

#### **PTEC 1313 Safety, Health, and Work Practices**

Introduction to occupational safety, health and environmental practices and associated equipment including: safety mindset and attitude; personal safety equipment; general safety policies and procedures; hazards communication; HAZWOPER/emergency response; first aid and CPR; industrial hygiene; exposure monitoring; and environmental compliance. This course will give students an overview of various governmental regulations mandated by OSHA, EPA, SARA, RCRA, DOT, NFPA, etc.

#### **PTEC 2014 Process Technology I- Equipment**

This course teaches the basic principles of process automation and demonstrates their applications in modern industrial practice. The course, continuing with PTEC 2024 Industrial Instrumentation I, provides a deeper understanding of process dynamics. Course content: basic control concepts; function structure of feedback control; sensors and transmission systems; controllers; control valves; process dynamics, tuning control systems; cascade control, dead time, feed forward multivariable and digital control.

#### **PTEC 2024 Industrial Instrumentation**

This course is designed to introduce the student to a simple pneumatic control loop. Specifically, the student will be introduced to pressure, temperature, level and flow transmitters and the various transducers used in the detection of changes in process variables; pneumatic controllers, valve positioners, control valve types, pneumatic relays and the null-balance system are also included as part of the control loop.

#### **PTEC 2124 Process Technology II- Systems**

A familiarization with the general types of processes found in the chemical and refining industry including: distillation and fractionation; reaction; absorption; adsorption; extraction; stripping; cracking; reforming; alkylation; delayed coking; hydro-processing; and sulfur recovery. This course also includes an explanation of product blending and water treatment, as well as steam and electrical power generation.

#### **PTEC 2214 Process Technology III- Operations**

This course will concentrate on the duties, responsibilities and expectations of the Process Operator with emphasis on understanding and adherence to procedures associated with start-up, shutdown, normal and temporary plant operations. Equipment monitoring, preventive maintenance, training and response to abnormal and emergency operating conditions are stressed as they apply to the work crew and operations team. Students will receive a “sense of reality” regarding the career of a Process Technician, including tips on adjusting to shift work, diversity in the workplace and communicating with the work team and customers.

#### **PTEC 2243 Principles of Quality**

The history of Quality will be explored from Deming’s theories to current applications in today’s petrochemical industry. Internal and external customer/supplier relationships of a business which affect the qualitative aspects of quality and the statistical methods, which affect the

quantitative aspects of measuring quality, will be stressed throughout this course. Students will be exposed to the benefits of continuous improvement and quality work as they pertain to developing a high performance work team.

**PTEC 2301 Industrial Observation**

Process Technology students will spend time job shadowing professional process technicians at local refineries.

**PTEC 2314 Oil & Gas Production I**

**PTEC 2443 Pipeline Operations & Controls**