

## 5th Class Power Engineering (PEN) Curriculum Mapping

### Program Curriculum

A collection of 13 CTS courses has been developed to align with the current 5th Class Power Engineering course outline. These courses, when combined, cover the technical training content.

Alberta Training Profile	CTS Course Alignment to Training Topics	Assessment
Topic	CTS Course Number and Name	
Fire Safety	PEN3400: Safety & Codes	
Building Safety		
Confined Space Entry		
Introduction to WHMIS		
Personal Safety Equipment		
Occupational Health and Safety Legislation		
<i>Boiler and Pressure Vessels Act</i>		
Introduction to CSA and ASME Codes for Boilers		
SI Units	PEN3405: Applied Science	
Basic Arithmetic Operations		
Transposition		
Area and Volumes of Solids		
Application of Basic Mechanics		
Introduction to Thermodynamics		
Introduction to Electricity	PEN3410: Electricity & Welding	
Lighting Systems		
Welding Terms and Inspection		
Building-water Supply Systems	PEN3415: Plumbing & Piping	
Sanitary-drainage Systems		
Piping Materials and Connections		
Piping Expansion, Support and Installation		
Steam Traps		
Introduction to Valves		

Alberta Training Profile	CTS Course Alignment to Training Topics	Assessment
Topic	CTS Course Number and Name	
Water-tube Boilers	PEN3420: Boiler Details	
Cast Iron Sectional and Modular Boilers		
Fire-tube Boilers		
Electric Boilers		
Basic Fittings for Steam Boilers		
Basic Fittings for Hot-water Boilers		
Low-water Fuel Cut-offs and Feedwater Controls	PEN3425: Boiler Operation	
Heating Boiler Operating Controls		
Boiler Combustion Controls		
Boiler Programming Controls		
Basic Boiler Operation		
Routine Boiler Maintenance and Inspection		
Combustion and Draft		
Burners for Boilers		
Heat Gains and Losses	PEN3430: Heating Systems	
Steam-heating Equipment		
Steam-heating Systems		
Hot-water-heating Systems		
Hot-water-heating Systems Equipment		
Warm-air Heating System Equipment	PEN3435: Human Comfort	
Warm-air Furnace Components and Maintenance		
Ventilation and Air Filters		
Infrared and Electric Heating		
Humidification		
Electric Controls for Heating Systems		
Refrigeration Theory	PEN3440: Refrigeration Theory	
Refrigerants		
Compression Refrigeration Systems		
Refrigeration Compressors		

Alberta Training Profile	CTS Course Alignment to Training Topics	Assessment
Topic	CTS Course Number and Name	
Heat Exchangers for Refrigeration Systems	PEN3445: Heating & Cooling	
Refrigeration Accessories		
Cooling Towers		
Air-conditioning Systems 1	PEN3450: AC & Refrigeration	
Refrigeration Metering Devices and Capacity Controls		
Refrigeration Cycle Controls		
Compression Refrigeration Systems and Pre-start-up Procedures		
Compression Refrigeration System Operations		
Air Compression		
Types of Pumps	PEN3455: Pumps & Compression	
Pump Operation and Maintenance		
Lubrication		
Types of Bearing Lubrication		
Introduction to Therm-oil Heaters and Systems		
Microturbines		
Internal Combustion Engine Gen-Sets		
Water Treatment	PEN3460: Water Treatment	
Monitoring and Testing		
CTS COURSES THAT ALLOW STUDENTS ADDITIONAL PRACTICAL TIME. THE HOURS REPRESENTED BY THESE FOUR COURSES ARE OVER AND ABOVE THE 325 HOURS.		
	PEN3465: PEN Practicum A	
	PEN3470: PEN Practicum B	