5TH CLASS POWER ENGINEERING COURSE SUMMARIES

COURSE PEN3400: SAFETY & CODES

Students will be able to discuss and describe fire safety, building safety, confined space entry and Workplace Hazardous Materials Information Systems (WHMIS) as well as demonstrate working knowledge of occupational health and safety legislation, provincial acts and regulations and codes for boilers from both the Canadian Standards Association (CSA) and the American Society of Mechanical Engineers (ASME) related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3405: APPLIED SCIENCE

Students will be able to perform simple calculations, complete arithmetic operations and define basic terms in the study of mechanics, as well as describe the principles of thermodynamics and modes of heat transfer related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3410: ELECTRICITY & WELDING

Students will be able to discuss the design and accessories of an electrical circuit, lighting systems and electric motors, as well as define welding terms and describe methods of weld inspection related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3415: PLUMBING & PIPING

Students will be able to explain various water supply and drainage systems and describe the operating principles, design, construction, operation, troubleshooting and maintenance of piping, valves, steam traps and thermoil systems related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3420: BOILER DETAILS

Students will be able to describe and demonstrate an understanding and operation of the various types of boilers and name, identify and explain the operating principles of steam and hot-water boilers and boiler fittings related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3425: BOILER OPERATION

Students will be able to name, identify and explain the design and operation of fuel cut-off, feedwater, operating, combustion and programming controls, as well as describe the preparation, start-up, shutdown, abnormal conditions, routine operation checks and service and maintenance required for hot-water boilers related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3430: HEATING SYSTEMS

Students will be able to describe the operating principles, design, construction, operation, troubleshooting and maintenance of steam and hot-water-heating systems related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3435: HUMAN COMFORT

Students will be able to describe the operating principles, design, construction, operation, troubleshooting and maintenance of warm-air heating systems; ventilation and filtration systems; infrared and electric heating systems; and humidification systems and processes related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3440: REFRIGERATION THEORY

Students will be able to explain refrigeration theory, refrigerant properties and the principles of compression refrigeration systems and the components of refrigeration compressors related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3445: HEATING & COOLING

Students will be able to explain the design and construction of heat exchange systems, describe components used in refrigeration systems and demonstrate the operation and maintenance of cooling towers related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3450: AC & REFRIGERATION

Students will be able to explain and describe the operation of various air-conditioning systems and the operating principles of metering devices, capacity controls and operational and safety controls on refrigeration systems as well as start-up procedures related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3455: PUMPS & COMPRESSION

Students will be able to explain the operating principles and maintenance procedures for different types of air compressors and pumps and be able to explain principles of lubrication and the simple care and maintenance of bearings related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3460: WATER TREATMENT

Students will be able to explain common external and internal water treatment methods including sampling, testing procedures and equipment related to 5th class power engineering.
***Prerequisite**: None*

COURSE PEN3465: PEN PRACTICUM A

Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.
***Prerequisite**: None*

COURSE PEN3470: PEN PRACTICUM B

Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.
***Prerequisite**: None*