

EN 128
4th Class Power Engineering Part A Online
10 Credits

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Created: 15/02/2000

Revised: 10/02/2021

Approval: 10/06/2021

The Implementation Date for this Outline is 31/08/2021

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EN 128 Version: 14



4th Class Power Engineering Part A Online

Calendar Description

This is a self-paced online course study of the Pan Global 4th Class Power Engineering material leading to provincial certification. The SOPEEC curriculum, which is used by all provincial power engineering regulatory bodies, has been used as a benchmark for the development of this course.

Rationale

This course is of particular interest to students looking for a new career or are presently employed as field operators or working with small boilers. Candidates who are considering a career in Power Engineering in their province of residence or work, may be required to successfully complete an approved course. Lakeland College is an approved program with ABSA in the province of Alberta. For those outside of Alberta needing to transfer the course completion please check with your provincial jurisdiction.

By successfully completing both this course and EN 129 (Part B) the student is provided with the theoretical knowledge necessary to challenge the provincial government Fourth Class Power Engineer's Certificate of Competency examination. In order to obtain the Lakeland College credential of 4th Class Power Engineering, the student will need to pass EN 128, EN 129 and obtain the steam time in EN 131 or QTRA 231.

Prerequisites

At present there are no prerequisites. However, it is strongly recommended the potential students have a good understanding of both math and physics.

Co-Requisites

None

Course Learning Outcomes

Depending upon which province the student is located, upon successful completion of this course, the student will be able to

1. apply to write their provincial government examination for the Part A 4th Class Power Engineering examination because they will be eligible; or
2. challenge Part A and B provincial government examinations if BOTH EN 128 (Part A) and EN 129 (Part B) are complete with Lakeland College-- once completed the Part A course the student receives a completion letter to submit to the appropriate government regulatory body to challenge the government Part A exam. Once completed the Part B course the student receives a completion letter to submit to the appropriate government regulatory body to challenge the government Part B exam. Once both exams are completed successfully and 6 months of steam time is approved by the regulatory body or EN 131 or a 200-hour approved steam lab (QTRA 231), a 4th class power engineering certificate is issued

Resource Materials

Required Resources:

Power Engineering - The Industry Standard Fourth Class Part A Textbooks, Unit 1 through 12;

Edition 3.0/3.5; *PanGlobal Training Systems Ltd*, Publication date 2017.

PanGlobal Extract of CSA Standards B51 & B52; Publication date 2012 or newer.

PanGlobal Academic Supplement 2.0 – Steam Tables, Refrigeration Tables & Handbook of Formula & Constants

PanGlobal ASME Academic Extract Boiler & Pressure Vessel Code Volume 1 Abstract; 2018 Edition. 2007 Edition is still acceptable.

Provincial Boiler & Pressure Vessel Acts and Regulations (for your specific province)

Optional Resource:

PanGlobal Power Engineering 4th Class Workbook - Part A (Edition 3)

Basic Mathematics & Physical Sciences Problem & Solutions Workbook for Power Engineering;

PanGlobal Engineering Training Systems, First Edition

Required Materials:

Scientific calculator

Conduct of Course

This is a blended learning environment. The basis of study is from the PanGlobal materials, supplemented with several learning videos embedded within the course content and continued facilitator input and support.

To successfully complete all aspects of the course, the student is expected to follow the suggested timeline for reading assignments and section exams.

To complete the theoretical and practical knowledge necessary to obtain their Fourth Class Power Engineer’s Certificate of Competency, the student must also complete:

EN 129 (Part B)

QTRA 231 (4th Class Steam Lab) Or equivalent within Industry or with another approved school/college.

Evaluation Procedures

The final grade is determined by five (5) section exams and a final examination.

5 Section Exams..... 50%

1 Final Examination.....50%

Grades Equivalents and Course Pass Requirements

A minimum grade of C+(65%) (1.00) is required to pass this course.

Letter	F	C+	B-	B	B+	A-	A	A+
Percent Range	0-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	2.30	2.70	3.00	3.30	3.70	4.00	4.0

Attendance

Weekly reading assignments are suggested in the Recommended Time Frame/Schedule. The student is expected to use it as a guideline to successfully complete the course work. Section exams remain open for the duration of the allocated four (4) month timeframe.

Course Units/Topics

Part A:

Unit A1 Elementary Mechanics and Dynamics

- Chapter 1: Introduction to Basic Mechanics
- Chapter 2: Forces and Moments
- Chapter 3: Simple Machines
- Chapter 4: Scalars & Vectors
- Chapter 5: Linear Velocity and Acceleration
- Chapter 6: Force, Work, Pressure, Power and Energy
- Chapter 7: Friction
- Chapter 8: Stress and Strain
- Chapter 9: Power Transmission

Unit A2 Chemical and Thermodynamic Principles

- Chapter 1: Introduction to Matter and Chemistry
- Chapter 2: Introduction to Thermodynamics
- Chapter 3: Introduction to Heat Transfer and Heat Exchangers
- Chapter 4: Thermodynamics of Steam

Unit A3 Legislation, Codes and Standards

- Chapter 1: Introduction to Power Engineering
- Chapter 2: Jurisdictional Legislation for Power Engineers
- Chapter 3: Codes & Standards for Power Engineers & Pressure Vessels

Unit A4 Plant and Fire Safety

- Chapter 1: Introduction to Plant Safety
- Chapter 2: Plant Safety Programs
- Chapter 3: Handling of Dangerous Materials
- Chapter 4: Plant Fire Safety
- Chapter 5: Fire Extinguishing Methods and Equipment

Unit A5 Introduction to Plant Operations and the Environment

Chapter 1: Introduction to Environment

Chapter 2: Gas & Noise Emissions

Chapter 3: Liquid and Solid Emissions

Unit A6 Elements of Material Science and Welding Technology

Chapter 1: Energy Plant Construction and Operation Materials

Chapter 2: Introduction to Welding

Chapter 3: Welding and Pressure Vessel Inspection

Unit A7 Introductory Fluid Handling Technology

Chapter 1: Introduction to Energy Plant Piping Systems

Chapter 2: Introduction to Energy Plant Valves

Unit A8 Basic Concepts in Electrotechnology

Chapter 1: Basic Electricity

Chapter 2: Magnetism and Electromagnetism

Chapter 3: Electrical Metering Devices

Chapter 4: Motors and Generators

Chapter 5: Transformers

Chapter 6: Electrical Distribution Circuits

Unit A9 Energy Plant Instrumentation and Controls

Chapter 1: Introduction to Energy Plant Controls and Instrumentation

Chapter 2: Introduction to Process Measurement

Chapter 3: Basic Control and Instrumentation Components

Chapter 4: Introduction to Programmable Controllers

Chapter 5: Electronic Control Systems and Computer Applications

Chapter 6: Electrical Control Systems

Unit A10 Fundamental Industrial Communication Skills

Chapter 1: Energy Plant Sketching

Chapter 2: Plant Diagrams and Drawings

Chapter 3: Plant Communications

Unit A11 Introduction to Boiler Designs

Chapter 1: Introduction to Boilers

Chapter 2: Fire Tube Boilers

Chapter 3: Water Tube Boilers

Chapter 4: Electric Boilers

Chapter 5: Special Boiler Designs for Heating Plants

Chapter 6: Differences Between Power and Heating Boilers

Unit A12 Elements of Boiler Systems

Chapter 1: Combustion

Chapter 2: Fuel Delivery and Firing Systems

Chapter 3: Draft

Chapter 4: Feedwater Systems

Chapter 5: Blowoff and Blowdown Systems

Chapter 6: Boiler Fireside Cleaning Systems



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