

# **EN 451**

## **Piping**

**1 Credit**

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## EN451 Version: 2



### Piping

#### Calendar Description

Code requirement, material of construction, support, strength and effects of temperature as well as piping layout and water hammer are the topics of this course.

#### Rationale

This course has been developed to support students seeking to further their careers, as Second Class Power Engineers, with an ever increasing industry demand to replace retiring Power Engineers and operate new facilities.

Industry has shifted their focus from employing the 4th and 3rd class levels of Power Engineering certification to higher levels of certification.

Upon successful completion of this program the student is eligible for a 9 month reduction in qualifying time experience granted by ABSA.

The six parts of the program are divided into 15 courses where the student has the option of registering for individual courses, Part A, Part B, or both Part A and Part B.

#### Prerequisites

EN 310, EN 320, EN 410, EN 420, or Third Class Power Engineer's Certificate of Competency

#### Co-Requisites

None

#### Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. explain selection criteria for piping materials.
2. calculate the required thickness and maximum allowable working pressure of piping.
3. describe typical inspection procedures for piping installations and repairs.
4. describe a typical routine inspection procedure and schedule for high-energy piping.

5. explain the effects of high temperature on piping strength.
6. describe the design and installation criteria for a piping system layout.
7. explain the theory and effects of water hammer.

## **Resource Materials**

### ***Required Text:***

*Power Engineering Second Class (2015) A-3 Boilers and Water Treatment (2nd ed.).*

Calgary, AB: PanGlobal Training Systems Ltd.

NOTE: Additional resource material is provided or accessed through D2L.

## **Conduct of Course**

This course follows the syllabus as set out by the Standardization of Power Engineer's Examination Committee (SOPEEC) and the curriculum recommended by the Interprovincial Power Engineer Curriculum Committee (IPECC).

This course builds on the student knowledge gained through the Fourth Class and Third Class Power Engineering courses.

This course is delivered face to face with a component of online directed study, and includes class lectures, group discussions, demonstrations, assignments, and projects.

Cutaway models, videos, and actual equipment may be used to support instruction and demonstrations.

Desire2learn (D2L) is an online course management suite and is used as an educational resource for tracking attendance, administering quizzes, and reporting grades. Students will access D2L directly, from any computer, and may view their progress, grades and attendance at any time.

This course consists of four chapters. There is an exam at the end of each chapter as well as a midterm and final exam.

The exams consist of seven written questions of which the student chooses five questions to answer. Each question is worth 20 marks and partial marks are awarded for correct methods and partial answers.

## **Evaluation Procedures**

Lakeland College is committed to the highest academic standards. Students are expected to be familiar with Lakeland College policies related to academic conduct and academic honesty and to abide by these policies.

The marking scheme for this course is:

Assignments or Projects	20%
Chapter Exams	20%
Midterm Exam	30%
Final Exam	30%

The lectures and dates of exams are determined in class.

Examinations contain long answer written type questions.

A minimum grade of 65% is required to pass this course.

**A GRADE OF AT LEAST 50% IS REQUIRED ON THE FINAL EXAM TO PASS THIS COURSE.**

Those students seeking a qualifying time reduction must achieve a grade of 65% for sections A-1, A-2, A-3, B-1, B-2, B-3 and maintain at least 80% attendance in the program.

Students receive a certificate from Lakeland College indicating successful completion of the program.

**NOTE:**

This program consists of six components; each component corresponds to one examination paper of the SOPEEC examination process.

The requirements for a second class power engineer consist of six examinations and 30 months of qualifying industry experience, with the exception of a 9 month credit for completion of all courses in the program.

### **Grade Equivalents and Course Pass Requirements**

*A minimum grade of C+ (65%) 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	4.00

## Attendance

For those students seeking the nine (9) month experience qualifying time reduction granted by ABSA, a minimum attendance of 80% in all courses is required, as per the Student Handbook. If the experience credit is not desired, there is no mandatory attendance requirement.

## Course Units/Topics

### Piping

(Explain piping system design, inspection, and maintenance)

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