

## DEPARTMENT OF SCIENCE

### COURSE OUTLINE – Fall 2022

#### POF 402 (VA2): 4<sup>th</sup> Class Power Engineering A2 – 4 (5-0-3) 88 Hours over 11 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

**INSTRUCTOR:** Wells Darling

**OFFICE:** J206

**OFFICE HOURS:** As posted

**PHONE:** 780-539-2819

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**CALENDAR DESCRIPTION:** This course, along with the other 4<sup>th</sup> Class courses, will prepare the student to write the ABSA/SOPEEC Interprovincial examinations. The second book will cover the environment, materials/piping/welding, basic electricity, plant instrumentation and controls, boilers and boiler systems. Plant tours may also be included in this course.

#### **PREREQUISITE(S)/COREQUISITE:**

A high school diploma including at least:

- 50% in English 30-1 or English 30-2
- 65% in Mathematics 30-1 or 70% in Mathematics 30-2
- 65% in Chemistry 30 OR Physics 30

OR

- Mature students not meeting the above requirements may request a review of their education and prior work skills by the Power Engineering Team at NWP.

#### **REQUIRED TEXT/RESOURCE MATERIALS:**

The following textbook and resource materials are required for the full 4<sup>th</sup> Class program, including courses POF 401, 402, 406, and 408. All books are from PanGlobal.org

- 4<sup>th</sup> Class Textbook Set – Part A [Ed. 3.5]
- 4<sup>th</sup> Class Textbook Set – Part B [Ed. 3.5]
- Preparatory Math Topics for Power Engineering [Ed. 2]
- Academic Supplement [Ed. 2.0]
- 2018 ASME Academic Extract (Vol 1)

The first 4 books are available as a bundle

4<sup>th</sup> Class – Standard Collection

<https://mypower.panglobal.org/pshop/4th-class/225-4th-class-standard-collection.html>

2018 ASME Academic Extract (Vol 1)

<https://mypower.panglobal.org/pshop/code-extracts-supplement/198-2018-asme-academic-extract-vol-1.html>

**NOTE: Older editions of Power Engineering textbooks are not acceptable. The changes between editions are enough to impact the likelihood of passing the ABSA exams.**

**DELIVERY MODE(S):** Lecture style presentation of material in person at the NWP Grande Prairie campus. Laboratory provides hands-on experience and will be delivered at the Fairview campus.

**COURSE OBJECTIVES:** This course enables students to gain an introduction to the concepts of electrotechnology, instrumentation, piping, and valves. Additionally, students will learn about the different types of boilers and their connected systems.

**LEARNING OUTCOMES:** The Standardization of Power Engineers Examination Committee (SOPEEC) has developed a Fourth Class Power Engineer's Syllabus (SOPEEC Syllabus) which has been approved by the Association of Chief Inspectors (ACI) to be used across Canada. A full copy of the current syllabus is available from ABSA at:

[https://www.absa.ca/media/1143/ab-054\\_4th\\_class\\_syllabus\\_new.pdf](https://www.absa.ca/media/1143/ab-054_4th_class_syllabus_new.pdf)

Or SOPEEC at:

<https://www.sopeec.org/>

After successful completion of this course you should be able to:

- Piping and Valves
  - o Describe the basic types of piping, piping connections, and supports.
  - o Describe the design and uses of the most common valves in industrial plants and on boilers.
- Electricity
  - o Describe the basic concepts of electricity and perform simple AC & DC calculations.
  - o Describe magnetism, electrical metering devices, AC and DC motors and generators, transformers, and electrical distribution.
- Energy Plant Instrumentation and Controls
  - o Describe the overall purpose and function of plant instrumentation and control systems.
  - o Describe the basic types of indicators and transmitters for level, pressure, temperature, and flow.
- Plant Communication
  - o Describe plant equipment sketches, common types of drawings and diagrams used in plants, and how to complete a plant line tracing diagram.
  - o Describe the different types and proper use of plant communication systems.
- Boilers
  - o Describe the historical development of boilers boiler design, components, and configuration.
  - o Describe the design, components, and characteristics of watertube, firetube, and electric boilers and boilers used in heating plants.
- Boiler Systems
  - o Describe basic theory of boiler combustion, fuels, draft, and feedwater.

**TRANSFERABILITY:**

Nontransferable, there are no transfer agreements in place.

**EVALUATIONS:**

PanGlobal Quizzes  
Unit Exams  
Final Exam

**GRADING CRITERIA:**

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	94-100		C+	2.3	68-71
A	4.0	89-93		C	2.0	64-67
A-	3.7	84-88		C-	1.7	60-63
B+	3.3	80-83		D+	1.3	55-59
B	3.0	76-79		D	1.0	50-54
B-	2.7	72-75		F	0.0	00-49

**COURSE SCHEDULE/TENTATIVE TIMELINE:** 11 weeks, from September 1 – November 4, 2022. Tests will be held during the course as chapters and units are completed.

**STUDENT RESPONSIBILITIES:** Students must be prepared to pre-read chapters and objectives prior to them being covered in class. Students must also be prepared to complete the online quizzes at the same time as the chapters are covered and other Instructor assigned assignments during out of class time. Students must complete all courses with no failing grades and a minimum of 67% and attend a minimum of 80% of all classes and 100% of labs to successfully complete the program.

**STATEMENT ON PLAGIARISM AND CHEATING:** Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the Northwestern Polytechnic Calendar at <https://www.nwpolytech.ca/programs/calendar/> or the Student Rights and Responsibilities policy which can be found at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

\*\*Note: all Academic and Administrative policies are available on the same page.