NORTHWESTERN POLYTECHNIC

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Fall 2022

POF 406 (VA2): 4th Class Power Engineering B1 – 6 (22-0-0) 110 Hours over 5 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	**PHONE:**	780-539-2819
OFFICE:	J206	**E-MAIL:**	wdarling@nwpolytech.ca
OFFICE HOURS:	As posted		

CALENDAR DESCRIPTION: This course, along with the other 4th class courses, will prepare the students to write the ABSA/SOPEEC Interprovincial examinations. The first part of 4B will cover lubrication, boiler safety devices, boiler operations, plant maintenance and water treatment.

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 4th Class program, including courses POF 401, 402, 406, and 408. All books are from PanGlobal.org

- 4th Class Textbook Set – Part A [Ed. 3.5]
- 4th 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
4th 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, design, and operation of lubrication and bearings, pumps, compressors, boiler safety devices, boiler operation, plant maintenance, and water treatment.

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
Or SOPEEC at:
https://www.sopeec.org/
After successful completion of this course you should be able to:

- Lubrication
  - Describe the importance of lubrication and the operating principles of lubrication.
  - Describe the care and maintenance of bearings and their importance.
- Pumps and Compressors
  - Describe the different types and operating principles of pumps and compressors.
  - Describe start up and shut down procedures for pumps and compressors.
- Boiler Safety Devices
  - Explain code and standards requirements for pressure relief valves on boilers, pressure vessels, and pressure systems.
  - Explain the safety controls for combustion, and feedwater on boilers.
- Boiler Operation
  - Describe the safe and efficient operations procedures for auxiliary equipment and boiler systems.
  - Describe the operational checks and readings that must be performed on boiler systems.
- Power Plant / Heating Plant Maintenance
  - Describe safe use of power tools, mechanical fasteners, and hoisting equipment.
  - Describe service, maintenance, and cleaning required for boilers.
- Water Treatment
  - Describe principles, methods, and equipment used for treating feedwater for use in a boiler.
  - Describe the treatment of condensate, cooling water, cooling towers, and water tests.

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: 4 weeks, from November 23 – December 16, 2022

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.