DEPARTMENT OF SCIENCE

COURSE OUTLINE – Fall 2025

PW 2301 A2: Process and Power Systems III – 7 (7-0-7) 210 Hours over 15 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: Curran Speager **PHONE:** 780-539-2865
OFFICE: J223 **E-MAIL:** cspeager@nwpolytech.ca

CALENDAR DESCRIPTION: This course covers topics relevant to power engineering such as chemistry fundamentals, metallurgy and materials, corrosion principles, industrial drawings, and fuels and combustion.

PREREQUISITE(S)/COREQUISITE: 4th class power engineering certificate of competency.

REQUIRED TEXT/RESOURCE MATERIALS:

The following textbook and resource materials are required for the second year of the PET program, including courses PW 2301, PW 2320, TT 2301, PC 2301, PW 2302, PW 2330, and TT 2302. All books are from PanGlobal.org

- 3rd Class Part A Textbook Set [Ed. 3.0]
- 3rd Class Part B Textbook Set [Ed. 3.0]
- Academic Supplement [Ed. 2.0] – Students may have this from year one.
- 2018 ASME Academic Extract (Vol 1) – Students may have this from year one.
- 2018 ASME Academic Extract (Vol 2)

The 3rd Class books and the 2018 ASME Academic Extract (Vol 2) are available as a bundle:

https://mypower.panglobal.org/pshop/3rd-class/229-3rd-class-standard-collection.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.

LEARNING OUTCOMES:
By the end of this course students will:

- Gain an understanding of fundamental chemistry concepts, including molecules, atoms, elements, compounds, and mixtures.
- Comprehend the structure of atoms, atomic weights, the mole concept, and molar mass calculations, along with their practical applications.
- Develop the ability to balance chemical equations and work with chemical formulae effectively.
- Analyze the properties and characteristics of acids, bases, and salts.
- Acquire knowledge about metallurgy, engineering materials, and non-metallic materials, along with their properties, grades, and applications.
- Understand the principles of corrosion, corrosion types, and methods for monitoring and preventing corrosion in industrial settings.
- Master the interpretation of engineering drawings, including Process Flow Diagrams (PFD), Piping and Instrument Diagrams (P&ID), equipment layouts, and material balances.
- Explore fuel properties, combustion chemistry, and efficient combustion requirements, enabling you to work with various fuels and control emissions.
- Develop proficiency in fuel analysis techniques, including proximate, ultimate, and heat value analysis, as well as calorimetry.
- Understand methods for controlling emissions, including NO_x, SO_2, and particulate matter, in line with industry standards.

TRANSFERABILITY: Nontransferable, there are no transfer agreements in place.

EVALUATIONS:

Assignments:	10%
Lab Assignments:	10%

Unit Exams:	30%
Final Exam:	50%

GRADING CRITERIA: Grades for this course will be assigned as a percentage. The minimum passing grade is 65%

COURSE SCHEDULE/TENTATIVE TIMELINE: 15 weeks. Unit exams will be held after chapters and units are completed.

STUDENT RESPONSIBILITIES:
Students must attend a minimum of 80% of all classes to and 100% of all labs to successfully complete the course.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at https://www.nwpolytech.ca/about/administration/policies/index.html.

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