

DEPARTMENT OF SCIENCE
COURSE OUTLINE – Winter 2026

PW 2330: Thermal-Fluid Systems II – 3 (3-0-0) 45 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
OFFICE HOURS:			

CALENDAR DESCRIPTION: This course will cover topics relating to refrigeration including refrigeration principles, systems, auxiliaries, and operation. Compressor theory, design, heat exchangers, and cooling towers will also be discussed.

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.

LEARNING OUTCOMES:

At the end of this course students will:

- Understand compression theory, including processes, relationships, and ratios.
- Explore compression applications for air, gas, and refrigerants.
- Comprehend positive displacement compressor principles, including reciprocating and rotary types.
- Learn about dynamic compressors, their design, operation, and use as blowers.
- Understand compressor surge prevention methods, involving the P-V curve and anti-surge systems.
- Familiarize yourself with starting and stopping procedures for both compressor types.
- Explore compressor auxiliaries, including intercoolers, safety devices, and lubrication methods.
- Understand components of compressed air systems, like receivers, filters, and dryers.
- Gain knowledge of refrigerant classifications, properties, and characteristics.
- Learn about compression systems, multi-stage configurations, direct vs. indirect systems, and refrigeration equipment maintenance.

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 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.