Power and Process Operations

MACPHAIL SCHOOL OF ENERGY

Overview

Power and Process Operations is a comprehensive eight-month program designed to equip you with the skills and knowledge necessary to excel as an operator in various power generation and processing industries.

It is the equivalent of a Fourth-Class Power Engineering program. It combines theoretical learning with hands-on laboratory experience utilizing the same type of equipment found in industry, ensuring that you are well-prepared to manage the day-to-day operations of complex power and processing systems safely and efficiently.

In this program, you will:

- learn the fundamentals of boilers, including design, operation and maintenance
- learn about heat and energy transfer and how it's used and managed in power systems
- learn the basics of electricity, electrical circuits, power generation and electrical safety, including how to safely operate electrical equipment in industrial settings
- learn about design, operation, maintenance and troubleshooting of different types of pumps and compressors
- get instruction on workplace safety, including fire safety, hazardous material handling and emergency procedures
- train in the instrumentation used to monitor and control engineering systems, including sensors, transmitters, controllers and actuators
- learn the basics of plant operations and troubleshooting
- learn the fundamentals of internal combustion engines, steam turbines and gas turbines, including design and operation typical to those found in facilities, industry and power plants
- establish the knowledge and skills to operate a refrigeration system used in process industries and facility cooling
- learn the fundamentals of facility environmental conditioning and control, including design and operation of air handling units, chillers and building automation systems
- gain an understanding of the water treatment, testing and analysis that promotes equipment and system longevity, including cooling, heating, steam, condensate and feedwater systems.

Graduates of this program find job opportunities in power generation, petrochemical, fertilizer, pulp and paper, natural gas processing, metallurgical, petroleum refining, food and beverage production industries, and facility operations. Most roles involve shift work and can often be located at remote sites.

This program will prepare you to challenge the Alberta Boilers Safety Association (ABSA) Fourth Class Power Engineer certification exams to earn your certification, setting the stage for a challenging and rewarding career in power and process operations.

Traits, skills and aptitudes

Those in power engineering tend to be objective, innovative and methodical.

You need:

- mechanical and some electrical aptitude
- to be physically agile and capable of lifting heavy objects
- good vision, hearing and eye-hand co-ordination
- manual dexterity
- communication skills
- organizational and decision-making skills
- the ability to work with others in a team environment.

You should enjoy analyzing problems and coming up with solutions, working as efficiently as possible, and have no problems adhering to safety standards and codes.

Wearing a hard hat and other PPE in the lab is mandatory. Holding a valid driver's license is strongly encouraged.

Those with serious colour vision defects or who suffer from claustrophobia or fear of heights may have trouble with certain aspects of instruction and may experience problems securing employment.

Academic path

Graduates can transfer course credits and enter the SAIT Power Engineering Technology program to earn their diploma with one additional year of study.

Professional designations and certifications

This program is integrated with the Alberta Boilers Safety Association (ABSA) certification system.

Graduates are eligible for membership in the following professional associations:

- Alberta Boilers Safety Association (ABSA)
- Institute of Power Engineers (IPE)
- International Pressure Equipment Integrity Association (IPEIA)
- National Association of Corrosion Engineers (NACE)

Credentials

After successfully completing this program, you'll receive a SAIT Power and Process Operations certificate.

Admission requirements

Applicants educated in Canada

Applicants must demonstrate English language proficiency and completion of the following courses or equivalents:

- at least 60% in Math 30-1 or 75% in Math 30-2 or Math 30-3, and
- at least 60% in English Language Arts 30-1 or 75% in English Language Arts 30-2.

SAIT accepts high school course equivalents for admission for applicants educated outside Alberta.

Applicants educated outside of Canada

All applicants who were educated outside of Canada must demonstrate English language proficiency and provide proof they meet the program admission requirements outlined above with an international document assessment. Find accepted educational documents and assessment options.

SAIT may also accept courses completed at certain international post-secondary institutions.

Costs

2025/26 tuition and fees

The following estimated costs are effective as of July 1, 2025.

The estimated total cost of tuition and fees is based on the suggested schedule of study. Following a modified schedule will impact the fees you pay per semester and may alter final costs.

Domestic Students

Year	Number of semesters	Tuition fees	Additional fees	Total per year
1	2	$5,550	$1,668.60	$7,218.60
			Total cost:	**$7,218.60**

The estimated total cost of tuition and fees for domestic students is based on the recommended course load per year.

The estimated total cost of tuition and fees for domestic students is based on the recommended course load per year.

International Students

The program total is based on the estimated amount you will pay if you enter this program during the 2025/26 academic year. The program total amount listed on your letter of admission may appear higher. This amount is your maximum tuition guarantee for the program. SAIT will not exceed this maximum, regardless of changes in tuition and fees between academic years.

Year	Number of semesters	Tuition fees	Additional fees	Total per year
1	2	$18,540	$1,668.60	$20,208.60
			Total cost:	**$20,208.60**

The estimated total cost of tuition and fees for international students is based on the recommended course load per year.

Books and Supplies

Books and supplies are currently $1,600 per full-time year.

This is a bring-your-own-device program with standard computer hardware and software requirements. See the specific requirements on our computers and laptops page.

Find your booklist on the SAIT Bookstore's website. The booklist will be available closer to the program start date. Can't find your program or course? The bookstore didn't receive a textbook list. Contact your program directly to determine if they're still refining course details or if you're in luck; no textbook purchase is required this term.

Required personal protective equipment (PPE)

The industry-approved PPE you'll need will be discussed during your first few days of classes. You'll require:

- standard coveralls
- CSA-approved (green triangle) protective footwear.

A hard hat and safety glasses will be provided to you. Hard hats are required to be worn in the lab.