

# Process Engineering

Memorial's Faculty of Engineering and Applied Science is one of the first universities in Canada to offer process engineering. This unique discipline is based on the principles of clean and green engineering and sustainable resource development. It is a broad field of engineering that encompasses the development, design, optimization and operation of sustainable processes for human needs.

Process engineering places emphasis on the processing and production of petrochemicals, oil, gas, minerals, food and any other materials used to obtain valuable products. Students and graduates of the process engineering program will be able to implement academic knowledge and integrated co-operative education experiences in a sustainable, efficient, safe and environmentally conscious manner to large-scale industrial development.

## Co-operative Education Opportunities

Co-operative education experiences of students within the Department of Process Engineering include a wide range of industries and opportunities. Examples of what our students can provide to employers include:

**Process engineering drawings and design** – conceptual design, PFDs, P&IDs, technical option feasibility selection, equipment design and sizing, material selection, instrumentation and controls design, safety and risk analysis, life-cycle analysis, material and energy balances and economic analysis;

**Metal and mineral engineering** – assisting employers with greener methods of mining and processing alloys and materials;

**Petroleum and petrochemical engineering** – helping predict and optimize reservoir performance through reservoir characterization and simulation, production engineering/flow assurance, and improved/enhanced recovery from oil and gas fields – both onshore and offshore with particular attention to remote and harsh locations;

**Chemical engineering** – specific courses in chemical unit operations, transport phenomena and reaction/separation processes make students useful in process design, optimization and operations;

**Pharmaceutical/nutraceuticals** – designing and operating equipment in pharmaceutical production (chemical and biological) and process optimization;

**Food engineering** – assisting to enhance quality and extend the life of food products and food processing facilities;

**Environmental engineering** – developing new methods, tools, and technologies for environmental management, pollution prevention, pollution control and mitigation;

**Production** – maintaining production levels or advising in the purchase and layout of equipment, process operation and/or production;

**Bioprocessing engineering** – designing processes and bioproducts from biomass and/or designing processes that use biologicals to produce products; and

**Reliability and safety** – assessing safety and reliability of processes and design inspection and maintenance strategies.



# Process Engineering Program Organizational Chart

Term	Fall	Winter	Spring
Year 1	<b>Engineering One</b>		
	Engineering Statics Introduction to Programming Engineering Graphics and Design Mechanisms and Electric Circuits Physics	Chemistry Mathematics English Professional Development Seminars	Work Term 1*
Year 2	<b>Academic Term 3</b> Engineering Professionalism I Engineering Mathematics Introduction to Process Engineering Thermodynamics I Chemistry and Physics of Engineering Materials I General Chemistry II	<b>Work Term</b> Work Term 1 Work Term 2	<b>Academic Term 4</b> Advanced Calculus for Engineers Process Engineering Thermodynamics Process Mathematical Methods Process Engineering Calculations Process Fluid Dynamics I
Year 3	<b>Work Term</b> Work Term 1 Work Term 2 Work Term 3	<b>Academic Term 5</b> Probability and Statistics Mass Transfer Process Heat Transfer Process Equipment Design I Chemistry and Physics of Engineering Materials II	<b>Work Term</b> Work Term 2 Work Term 3 Work Term 4
Year 4	<b>Academic Term 6**</b> Process Modeling and Analysis Process Chemical Reaction Engineering Process Equipment Design II Process Fluid Dynamics II One technical elective	<b>Work Term</b> Work Term 3 Work Term 4 Work Term 5 (Optional)	<b>Academic Term 7</b> Process Dynamics and Control Process Engineering Design Project I Process Plant Design and Economics Two technical electives
Year 5	<b>Work Term</b> Work Term 4 Work Term 5 (Optional) Work Term 6 (Optional)	<b>Academic Term 8 (Graduation)</b> Engineering Professionalism II Process Engineering Design Project II Three technical electives	* Students who complete the Engineering One requirements during their first two semesters of year one eligible to take Work Term 1 during the spring semester.  ** Start of technical stream in either Petroleum or Process Engineering.

## More information ...

If you would like to know more about the process engineering undergraduate program at Memorial University, please contact:

Process Engineering Departmental Office  
709-864-2709  
[www.mun.ca/engineering/process](http://www.mun.ca/engineering/process)