

GRADUATE STUDIES

ENERGY AND NUCLEAR ENGINEERING

Energy Efficiency for Buildings



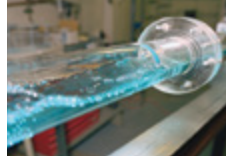
Hydroelectric Energy



Renewable Energies



Nuclear Engineering



Intelligent Energy Systems and Networks



AREAS OF SPECIALIZATION AND PROGRAM OPTIONS

Energy Efficiency for Buildings

This field covers the most efficient techniques of building design, modelling and simulation of energy performance and energy systems, the integration of renewable energy sources into building design, and the management of energy and storage systems with a view to integration into intelligent systems.

This axis aims to give students a solid scientific base to improve building design, to intelligently integrate renewable energy and to quantify the impact of design and operational choices through the use of modelling and simulation of energy performance. Future graduates will be able to meet the needs of industry and of institutions to meet the challenges presented by the need for high energy performance buildings.

Hydroelectric Energy

This field covers, among others, hydrology and hydrological models, materials, hydraulics (the application of fluid mechanics), the safety and stability of hydraulic structures, geology and geotechnics, production (turbine-alternator group), the transmission and distribution of electric power, and the profitability of hydroelectric projects.

Nuclear Engineering

This field covers the study of digital technology in nuclear power plants, of nuclear techniques not for energy generation purposes, the theoretical and experimental study of diphasic flows and the multidisciplinary aspects of energy.

It is mainly interested in the operation of nuclear power plants, as well as the physics and thermal aspects of reactors.

Renewable Energies

This area covers solar energy, wind power, geothermal, hydraulic, thermoelectric energy, biomass and waste energy, energy storage, energy efficiency and electric vehicles.

Students receive training that allows them to analyze the impact of the different characteristics of energy sources, how their distribution affects quality of life and their importance in assuring an equitable and efficient energy base.

This axis allows students to focus their education on various fields, such as the analysis, selection, sizing, installation, efficiency and maintenance of energy systems as well as on the challenges of technological development related to mass production, the installation of these energy sources and their importance in the diversification of energy input.

Intelligent Energy Systems and Networks

This field covers telecommunications and electrical networks, as well as the opportunity to specialize in one or more of the following areas: control and optimization, computer science, data mining and processing, electrical networks and telecommunications.

This option provides an overview of several sub-systems of various types: energy production, transmission and distribution systems, control systems, telecommunications systems, security systems and data management, and underlying optimization systems.

INSTITUT DE L'ÉNERGIE TROTTIER

Energy is an important theme at Polytechnique Montréal's centres of excellence. Based at the Institut de l'Énergie Trottier (IET), its mission focusses on three principles: education, research and transfer of knowledge. The IET seeks to foster a systemic and inter-disciplinary understanding of energy issues for the next generation of engineers, to encourage research in sustainable solutions that ensure the future of energy regeneration, and to raise the level of debate on social issues stemming from energy renewal.

For more information: iet.polymtl.ca

NUCLEAR ENGINEERING INSTITUTE

The Institut de génie nucléaire (IGN – Nuclear Engineering Institute) is the only university entity in Québec to offer a complete range of postgraduate training in nuclear engineering. The professors and researchers at the Institute, which is part of the Department of Engineering Physics, contribute to research in four areas : computer simulations of nuclear power plants, the development and application of experimental nuclear techniques, the study of theoretical and experimental thermalhydraulics and the experimental study of fluidelastic instabilities in two-phase flows. For more information : polymtl.ca/phys



RESEARCH CHAIRS

- Industrial Research Chair NSERC/AECL/BWC in Fluid Structure Interaction (N. Mureithi and S. Étienne);
- International Life Cycle Industrial Research Chair (R. Samson, M. Margni, L. Deschênes);
- NSERC - Hydro - Quebec - Schneider Electric Industrial Research Chair on Optimization for the Smart Grid (M. Anjos);
- NSERC/Prolamina on Materials and Films for Safe, Smart and Sustainable Packaging (A. Ajji);
- NSERC/Hydro-Québec/RTE/EDF/OPAL-RT Industrial Research Chair on Multi Time-Frame Simulation of Transients for Large-Scale Power Systems (J. Mahseredjian);
- Research Chair on Waste Recovery (R. Legros);
- Tier 1 Canada Research Chair in Computational Thermodynamics for High Temperature Sustainable Processes (P. Chartrand);
- Tier 2 Canada Research Chair in Intensified Mechano-Chemical Processes for Sustainable Biomass Conversion (D. Boffito).

INSTITUTES, CENTRES AND RESEARCH GROUPS

- Nuclear Engineering Institute (IGN);
- Trottier Energy Institute for *Institut de l'énergie Trottier* (IET);
- Environment, Sustainable Development and Circular Economy Institute (EDDEC);
- International Reference Centre for the Life Cycle of Products, Processes and Services (CIRAIG);
- CRIP-Biorafinery Centre;
- Research Unit on Energy Efficiency and Sustainable Implementation of the Forest Biorefinery (E2D2BF).

POTENTIAL EMPLOYERS WORKING IN THE FIELD OF ENERGY

- Federal and provincial governments;
- Energy producers and distributors;
- Engineering consulting firms;
- Major energy consumers
- Architects and builders of residential, commercial and industrial buildings;
- Manufacturers of materials used for energy production and distribution;
- Consulting firms;
- Non-governmental organizations.

INFORMATION

Recruitment Service

514 340-4928

futur@polymtl.ca

POLYTECHNIQUE
MONTRÉAL

WORLD-CLASS
ENGINEERING



polymtl.ca/futur/es/en

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