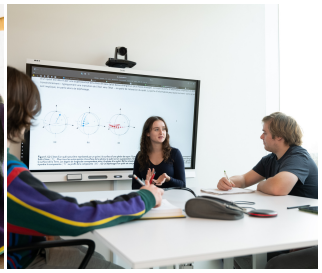
Programme **COOP**

PHYSICS



The Université de Sherbrooke Physics program joins laboratories, formal classroom instruction, work terms and projects to give to the students a solid general formation preparing them to solve complex problems of today's highly technological societies.

Students of this formation not only master the basic concepts and fundamental laws of physics, but also learn to make wise use of mathematical and computer tools, as well as experimental techniques of modern physics. The diversity of covered subjects - subatomic physics, astrophysics, physics of solids, optic, digital simulation, etc. - assures an ideal preparation for the job market.

WHAT OUR STUDENTS CAN DO FOR YOU

Design

- Software design and programming (C/C++)
- Design and modification of equipment and machinery
- Equipment manufacturing follow-up
- Evaluation and selection of equipment
- Elaboration of procedures
- Assays and data acquisition
- Design of software applications and of automated data acquisition and analysis systems (e.g. Labview)

Research and development

- Defining problems in mathematical and algorithmic terms
- Presenting results in the form of charts and diagrams
- Writing laboratory protocols
- Results interpretation
- Installation and start-up of new equipment
- Data processing
- Preparing technical reports
- Sampling
- Problem solving
- Information research
- Prototype development
- Test bench assembly

CEWIL | ECAMT CANADA ACCREDITED PROGRAM PROGRAMME AGRÉÉ

USherbrooke.ca/stages

UDS Université de Sherbrooke

KNOWLEDGE AND SKILLS

Term	Description
S-1	Intuitive and formal approach in mathematical tools to describe relations between variables and represent systems from various angles; laws of classical mechanics and geometric or undulating optics.
S-2	Mathematical tools and their application to physical problems - systems with several variables and decomposition; introduction to the undulatory nature of physical phenomena and to scientific instruments; electromagnetic phenomena; preparing clear and concise reports; mastering of electric measurement tools and a programming language, C++.
S-3	Analysis of experimental results in classical experiments in the main fields of physics, requiring precision and knowledge of LabView, vacuum systems, coherent reception and polarization; Hamiltonian and Legrangian classics with constraints; introduction to quantum and statistic physics; relations between microscopic description and thermodynamics; introduction to electric circuits (analog and digital); advanced mathematical tools for theoretical physics.
S-4	Numerical methods for problem solving; relations between special relativity and the laws of electromagnetism; Dirac equation in the description of quantum problems; quantum and classical perfect gases; phase transition and transport; tool manipulation: magnetic fields, radioactivity, spectroscopy, plasmas, ionization chamber.
S-5	Current research laboratory techniques: liquid helium cryostat, X-ray diffraction, photolithography, photoluminescence, quantum Hall effect, Fourier and Mössbauer spectroscopies, tomography, holography, superconductivity, electron paramagnetic resonance; detailed review of experimental resultsts; interactions in quantum mechanics and introduction to the main domains of physics: physics of solids, hydrodynamics, astrophysics and various modules (scientific computing, medical physics and nanotechnology).
S-6	Introduction to general relativity, modern optics, subatomic physics and quantum computing; study of various modules (scientific computing, medical physics and nanotechnologies); history and evolution of the scientific thought. Access to research laboratories.

ORGANIZATION OF STUDY (S) AND WORK TERM (W)

1st year			2nd year			3rd year			4th year			5th year
FALL	WIN	SUM	FALL	WIN	SUM	FALL	WIN	SUM	FALL	WIN	SUM	FALL
S-1	S-2		S-3	W-1	S-4	W-2	S-5	W-3	S-6			
	S-1		S-2	S-3		S-4	W-1	S-5	W-2	S-6	W-3	S-7