Co-op Program

COMPUTER ENGINEERING



The Computer Engineering program spotlights a skill-building, competence-focused teaching methodology based on an innovative approach referred to as Project-based and Problem-based Learning in Engineering. It promotes independent thinking, develops self-directed leaning and stimulates collaborative knowledge-building skills through project teamwork. Students learn to address complex engineering situations that entail scientific, technical, economic, social, human and ethical considerations.

Focused on the design of systems and services in the fields of system and software engineering, digital electronics and microprocessors, signal processing, telecommunications and networks, the program also includes specialization modules in networking, protocols and services, artificial intelligence, robotics and a software engineering concentration.

WHAT OUR STUDENTS CAN DO FOR YOU

Management

- Evaluate solutions and problem-solving
- Plan, organize, supervise, control, manage and follow-up on projects
- Coordinate hardware installation
- Write reports, guides, technical manuals and training materials
- Test strategy and plan
- Testing
- Evaluate, select and implement hardware and software packages
- Process quality control

Design

- Computer systems, including embedded systems hardware and software
- Electrical controls, electronic circuits, microprocessors, servo systems and digital filters
- Design and integration of telecommunication systems
- Protocol implementation
- Functional requirements and technical specifications (UML notation)
- Design of distributed object applications
- Develop applications for PDAs, mobile phones, Pocket PC, VoIP, transactional Web, and various platforms and game consoles
- Analyze and design JAVA
- Create a virtual machine with VMWARE

Development and Maintenance

- Anomaly detection and debugging
- Add features to existing applications
- Set up development environments
- Infrastructure deployment and operation, server installation
- System safety standards application
- Set up procedures, tools and development environment
- Design automation tools

Research and Development

- Assembly and testbenching
- Testing and data acquisition
- Result interpretation

CEWIL | ECAMT CANADA ACCREDITED PROGRAM PROGRAMME AGRÉÉ

USherbrooke.ca/ssdp/en

UDS Université de Sherbrooke

KNOWLEDGE AND SKILLS

Term	Description
S-1	Design and problem-solving process; analyzing, designing and making simple electronic circuits; electromechanical prototype assembly; C/C++ software development and advanced microprocessor programming languages; spoken and written communication; information research; teamwork; Altium; MATLAB and Visual Studio.
S-2	Design, develop and build software and electronic systems; project management; design and develop logic circuits using FPGA; design and develop analog filters; introduction to VHDL, signal analysis; analyze, model, design, implement and test software; algorithms and data structures; graphical interfaces; MS Project; C++ ; UNIX; GCC; Make; UML; Visual Studio; Qt; MATLAB; Xilinx; Altium.
S-3	Design, develop and build a Web application on microcontroller; develop applets and servlets; network, OSI, Ethernet, TCP/IP, http applications; RISC assembler programming; performance analysis (cache memory and pipelines); FPGA circuit design; calculating probabilities; selecting models and result interpretation; language theory; automata and regular expressions; EBNF notation; JAVA SDK; Servlets; Eclipse; Xilinx; GCC; Winsock Sockets; TCP/IP; VHDL; MIPS assembler and http servers.
S-4	Design, develop and build a digital simulation system using the ECSS project management standard (similar to PMBOK); numerical methods for engineers, mathematical modeling of mechanical and electrical systems; discrete signal processing; computer graphics; digital signal processing (filters); the role of the engineer in society; MatLab and Simulink.
S-5	Design, develop and build an embedded system; TCP/IP protocol stack integration; concurrent programming and running a real-time core (CPU distribution, synchronization, inter-process communication, input/output); analog conversion circuits; DMA; signal conditioning; physical properties of materials; law; health and safety; ARM architecture; LogicPD LH79520 card; ZOOM PDA development system; cygwin environment; GNU tools; CVS and µC/FS Micriµm.
S-6	Design, develop and build a network application; distributed architectures (client-server and database); conceptual, relational and distributed object model; multimedia data; plan and carry out verification and validation tests; safe access practices; encrypted communication and design; electromagnetic waves propagation model; evaluating a communication link; coding techniques; modulation and demodulation; ethical approach; Oracle; PostGres; SQL; LDAP; JDBC; ODBC; LINUX, GWT, GWTP. PowerDesigner, JPA, Hibernate, TopLink.
S-7 S-8	**Major concept projects, according to the following specializations:** Artificial intelligence and robotics, Network and telecommunications, Software engineering (concentration), IT security (module), Bioengineering (module), Agile development methodology and advanced development methodology (modules), Information coding (module)

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

GROUP	1st year			2nd year			3rd year			4th year			5th year
	FALL	WIN	SUM	FALL	WIN	SUM	FALL	WIN	SUM	FALL	WIN	SUM	FALL
A	S-1	S-2	W-1	S-3	W-2	S-4	W-3	S-5	S-6	W-4	S-7	W-5	S-8
B	S-1	S-2	S-3	W-1	S-4	W-2	S-5	W-3	S-6	W-4	S-7	W-5	S-8