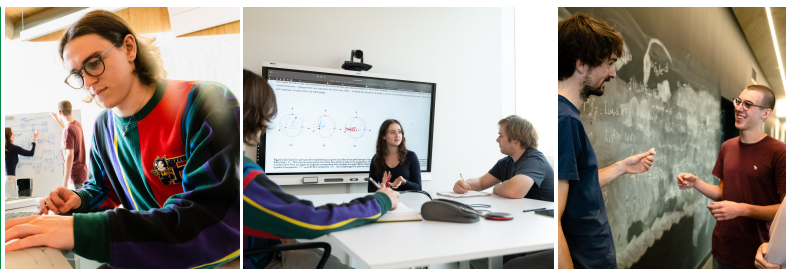


Programme **COOP**

MULTIMEDIA AND VIDEO GAME SCIENCES



Unique in Canada, the Bachelor in Multimedia and Video Game Sciences program focuses on software development concepts for creating, processing and managing multimedia content on various types of digital platforms (graphics, video, audio, etc.), as well as for video game design (video game engine). With the goal to fill a critical need for skilled talent in the field, this study program integrates both computer science and mathematics to work with various forms of media for a wide range of applications, from entertainment (games, special effects, etc.) to medical imaging.

Students learn theory and practice needed to develop state-of-the-art applications. They gain knowledge and crucial skills to design and implement reliable, general and readable software, as well as to define, manage and implement projects specific to computer graphics and image synthesis, image processing, computer vision, virtual reality and augmented reality – elements that are increasingly in demand in the field of video gaming.

WHAT OUR STUDENTS CAN DO FOR YOU

Analysis, Design and Development

- Cross-platform and multiplayer video games
- Motion capture tools (biomechanics)
- State-of-the-art tools for improved visual rendering in a video game
- Video games and special effects tools
- Artificial intelligence and data mining modules for multimedia
- Visualization tools and image converters (texture, mosaics, etc.)

- Digital video transfer tools
- Speech recognition tools
- Video and sound editing tools
- Automatic item extraction from satellite imagery
- 2D and 3D image handling and processing tools
- Multimedia content search engines
- Magnetic resonance imaging
- Image analysis for early disease detection
- Image fusion functionalities
- Acoustic event recognition modules
- Animation and rendering tools

Management

- Test strategies and plans
- Project planning and maintenance
- Technical reports and training materials



KNOWLEDGE AND SKILLS

Term	Description
S-1	Digital Media and Imaging Fundamentals Differential and integral calculus; linear algebra; digital media acquisition (graphics, audio, video); influence of acquisition mode; software development in C/C++; video game foundation; mathematical tools for image processing.
S-2	Computer Graphics and Image Processing Basics Computer graphics; construction of a hierarchical graphics core; geometric transformations; image analysis and processing (image transforms, filtering, restoration, feature extraction); databases; data structure; advanced software development in C/C++.
S-3	Digital Media Processing Digital audio processing; design of digital audio communication systems; speech processing; image synthesis; rendering algorithms; optical effects; probability and statistics; advanced object-oriented programming; interface creation; ethical and legal principles in computer science.
S-4	Intelligent Digital Media Processing Computer vision; 3D reconstruction; numerical methods; algorithmics; parallel computing; software development and optimization techniques.
S-5	Advanced Digital Media Processing Artificial intelligence; electives*.
S-6	Digital Media and Imaging Knowledge Integration Data sciences; learning techniques, optimization; carrying out a major project (industrial or research); electives*.
Imagery Electives	Multimedia and Video Games Computer animation; immersive environments (virtual reality; augmented reality); medical imaging; data transmission and coding.
General Electives	Computer Science Advanced databases; real-time programming; telematics; information security; project management; system programming; formal languages; software engineering

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

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