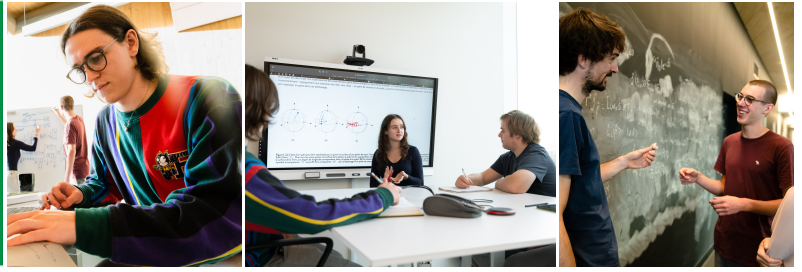


Co-op Program

COMPUTER SCIENCE MASTER'S VIDEO GAMES



The Master of Computer Science, Video Game pathway, was designed in collaboration with the industry and is taught by professionals working in the video game industry.

Your future hires:

- Already have an undergraduate degree in computer science or a related discipline
- Are software development specialists for the video game industry and related businesses
- Have a mind for analysis and synthesis, intellectual rigour and listening and communication skills
- Are able to design and program a variety of video game components
- Know how to use standard industry tools, such as commercial game engines and specialized digital content integration software

WHAT OUR STUDENTS CAN DO FOR YOU

Design and development

- Participate in analyzing, designing and programming video game components in relation to:
 - Gameplay
 - Artificial intelligence
 - Rendering
 - Audio
 - User interface
- Design, implement and maintain game mechanics while providing clear documentation
- Participate in analyzing, designing and programming development tools
- Debug problems reported by the quality assurance team
- Prototype gameplay features and mechanics

- Work with other professionals (artists, designers) on a game production team to confirm needs and requirements
- Support production teams by ensuring their systems and tools are stable and run smoothly
- Create clear, structured programming that meets requirements
- Document their work to transfer their knowledge and help production understand the systems and their features
- Keep up to date with advances in the programming field
- Optimize game systems to ensure performance and optimization on various platforms
- Design, improve and test features to give the game a simple, high-performance physics simulation and detection system

About the program

- In-depth knowledge of computer science and the video game field
- Video game production
- Mathematics and physics
- Computer graphics
- Digital media
- Gameplay
- Artificial intelligence
- User interfaces
- Real-time and distributed computing
- C++ language
- Project-based learning approach



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KNOWLEDGE AND SKILLS

Term	Description
S-1	<ul style="list-style-type: none"> • Introduction to the gaming industry <ul style="list-style-type: none"> ◦ Getting to know industry players • Applied artificial intelligence <ul style="list-style-type: none"> ◦ A*, FSM, behaviour trees, GOAP/HTN, etc. • Advanced object-oriented design <ul style="list-style-type: none"> ◦ Advanced OO design, modern programming practices • Applied mathematics and physics concepts in video games <ul style="list-style-type: none"> ◦ Video game mathematics, physics engines • Foundation in video game graphics <ul style="list-style-type: none"> ◦ Cameras, lighting, file formats, textures, materials, shaders, etc. • Video game production process <ul style="list-style-type: none"> ◦ Workflow, game engines, Unreal, Unity • Video game project management <ul style="list-style-type: none"> ◦ Agility, communication, leadership, processes, collaboration, continuous improvement
S-2	<ul style="list-style-type: none"> • Integrative video game project <ul style="list-style-type: none"> ◦ Multiplayer game in 18 weeks, commercial tools and engine • Specialized video game programming concepts <ul style="list-style-type: none"> ◦ Multiprogramming, metaprogramming, resilient code, optimization, advanced programming techniques • Video game gameplay <ul style="list-style-type: none"> ◦ Game design, UI/UX, architecture, modularity • Distributed programming <ul style="list-style-type: none"> ◦ Back-end and deployment services, distributed databases, dedicated servers and scaling, distributed gameplay • Integrating digital media into video games <ul style="list-style-type: none"> ◦ Images, video, audio, tools, data-driven design, analytics, serialization • Technology intelligence in video games <ul style="list-style-type: none"> ◦ Technical workshops on innovations in the video game world

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

Group	FALL	WINT	SUM	FALL
International combination (M1)	S-1	S-2	W-1 (4 or 6 months)	
Other combination	S-1	S-2	W-1 (4 months)	-