GAME DEVELOPMENT: PROGRAMMING, MS

for the degree of Master of Science in Game Development: Programming Concentration

The Programming Concentration of the Master of Science in in Game Development (MS in Game Development) degree provides technical training and practical experience for students interested in working in professional game studios, game-adjacent industries or other businesses where game-related programming skills are increasingly in demand. The program fosters critical skills in collaboration, communication, integration and professional business practices, along with technical skills in game programming. After the first year of coursework, students will shift the balance of their course work towards in-studio experiences within a professional game-development environment. The Programming concentration will serve traditional graduate students as well as industry professionals who are interested in attaining a post-graduate degree while diversifying their professional skills.

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Code	Title	Hours
Major Required Courses		
GSD 511	Game Development I	4
GSD 512	Game Development II	4
Choose one or both for a total of 16 credit hours:		16
GSD 513	Practicum in Game Development I (Internal Studio)	
GSD 514	Practicum in Game Development II (External Studio)	
Programming Concentration Required Courses		
Choose 12 credit hours from the following:		12
GSD 550	Tools & Techniques of Game Programming (may be repeated if topic varies)	
GSD 551	Tools & Techniques: Contemporary Techniques for Programming of Games	
CS 415	Game Development	
Programming Concentration Electives		
Choose 12 credit hours from the following:		12
CS 418	Interactive Computer Graphics	
CS 419	Production Computer Graphics	
CS 445	Computational Photography	
GSD 515	Professionalization Seminar: Portfolio Production & Personal Branding	
GSD 521	Tools & Techniques: Contemporary Techniques for 2D Art for Games	
GSD 522	Tools & Techniques: Contemporary Techniques of 3D Art for Games	
GSD 523	Tools & Techniques: Contemporary Techniques of 3D Animation for Games	
GSD 530	Tools & Techniques of Game Design (may be repeated if topic varies)	
GSD 531	Tools & Techniques: Contemporary Techniques in Game Design	
GSD 540	Tools & Techniques of Game Production (may be repeated if topic varies)	
GSD 541	Tools & Techniques: Contemporary Techniques of Game Production	
GSD 561	Tools & Techniques of Game Narrative: Contemporary Techniques in Writing for Games	
Total Hours		**48**

Other Requirements

Code	Title	Hours
Minimum GPA		2.75
Minimum Hours at 500 Level		12

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The goal of the the MS in Game Development program is to provide practical, technical, critical, and ethical training, awareness, and experiences to students who are interested in working in professional game studios, game-adjacent industries, or in other work places where game-related skills are required. To this end, the program includes four shared objectives for students across all concentrations:

1. Practical Training: Understand the roles and specifications involved in the professional development of games and interactive media, using industry-standard practices for communication, collaboration, and process flow at every stage in the development process.
2. Technical Training: Demonstrate polished game development skills in a chosen specialization sufficient to create or significantly contribute to a publishable interactive experience.
3. Critical Training: Be knowledgeable about and conversant with social, psychological, economic, and technological contexts and impacts of games and simulations in society.
4. Ethical Training: Develop the ethical, relational, and collaborative skills necessary for working on a diverse and inclusive research or design team.

Learning objectives for the Programming concentration include:

1. Proficiency in distributed code development processes.
2. Mastery of at least two programming specializations:
   a. 3D environment coding
   b. Virtual Reality (VR) and Augmented Reality (AR) coding
   c. Physically based rendering (PBR)
   d. Global Illumination (GI)
   e. In-game Artificial Intelligence (AI) - squad and individual based
   f. Procedural generation of assets and gameplay
   g. Backend systems supporting large multiplayer games as well as large concurrent player counts
3. Proficiency in debugging methods and tools.

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