

**SKILLS FRAMEWORK FOR MEDIA
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT**

TSC Category	Game Programming and Quality Assurance					
TSC Title	Game Physics Development					
TSC Description	Design and develop programs to apply the laws of real-world physics on in-game objects to achieve realism in terms of visuals and gameplay					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			MED-GDP-3011-1.1	MED-GDP-4011-1.1	MED-GDP-5011-1.1	
			Develop programs to model physics simulations for games and optimise existing physics engines for better game performance	Lead the design and development of the physics systems to be created for game development	Define the technical goals for the development of physics systems aimed at supporting game development	
Knowledge			<ul style="list-style-type: none"> Principles and concepts of implementation of real-world physics in games Theories and application of principles of mathematics High-level and low-level programming languages Principles and applications of multi-threaded programming Features and functionalities of game engines 	<ul style="list-style-type: none"> Theories and concepts of Newtonian mechanics, rigid body mechanics, soft body mechanics and Brownian motion as applicable to game development Principles and concepts of implementation of real-world physics in games Technologies used in physics simulation and standard physics engines Capabilities and limitations of standard physics and game engines Processing capabilities of current hardware to run complex physics simulations Simulation models to accurately represent real-world physics Types of technical designs 	<ul style="list-style-type: none"> Theories and concepts of physics required in game development Industry standards in technologies for physics simulation and standard physics engines Research techniques and methods Hardware and software capabilities, features and bottlenecks for physics systems Capabilities and limitations of standard physics and game engines 	

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<p>Abilities</p>			<ul style="list-style-type: none"> • Write code to implement simulations for physics systems • Test own code for required functionalities • Debug physics code for errors based on self-testing and quality assurance feedback • Maintain existing physics systems for implementation in game development • Liaise with game development project teams to enhance and extend physics systems to meet custom project requirements • Optimise the performance of existing physics systems based on feedback from quality assurance and gameplay testing • Create and maintain documentation for physics systems as per established guidelines and conventions 	<ul style="list-style-type: none"> • Define the scope of the development of physics system to achieve the established technical goals • Determine the technical requirements of the physics system based on the target platforms, target game genres and technical capabilities of target games • Design the technical specifications for physics systems to be developed based on the technical goals • Design the technical blueprint for the development of physics systems in terms of its capability, architecture and interaction with target hardware • Create technical designs to represent the architecture of the physics system • Develop technical briefs to communicate the technical goals and specifications to the programming team • Oversee the creation and prototyping of simulations to be developed into the physics system • Review code written by the programming team to suggest optimisations • Oversee the performance testing of 	<ul style="list-style-type: none"> • Drive research to understand the current technologies in physics simulations that can be applied in game physics systems in considerations of the specifications of typical gaming hardware • Establish the technical goals of the physics capabilities to be achieved from the development or customisation of a physics or game engines, to meet internal and external needs of upcoming game development • Review the design blueprint for the physics system to propose modifications in consideration of the technical goals • Establish guidelines and conventions for the documentation of physics systems and prototypes • Review physics systems to propose refinements on the basis of functionality, performance and hardware requirements • Drive the implementation of physics systems in game development 	
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				prototypes and finalised physics system <ul style="list-style-type: none"> • Liaise with game development teams to support the implementation of physics system in a game 		
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