

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

TSC Category	Game Programming and Quality Assurance					
TSC Title	Game Engine Development					
TSC Description	Design and develop a suite of customisable tools and programs for specific aspects of game development including graphics, physics, artificial intelligence, gameplay, level and sound development modules, which form the basis of game development					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		MED-GDP-2008-1.1	MED-GDP-3008-1.1	MED-GDP-4008-1.1	MED-GDP-5008-1.1	
		Write code for implementing specific functionalities within a module of game engines and support	Develop specific modules for new game engines and optimise modules for existing game engines, to aid game development	Define the technical goals, scope and functionalities to be implemented in the game engine and lead the development of the overall game engine	Define the vision and technical goals of the game engine to meet current and future game development requirements	
Knowledge		<ul style="list-style-type: none"> Research methods and techniques Principles and concepts of linear algebra, trigonometry and vector mathematics applicable to game development Fundamentals of game engines, modules and components Applications and use-cases of game engine features and functionalities Standard high-level programming languages used in engine design Standard low-level programming languages and techniques 	<ul style="list-style-type: none"> Principles and concepts of linear algebra, trigonometry and vector mathematics applicable to game development Game graphics, game physics, artificial intelligence, sound, user interface and other core functional aspects of game development Features and functionalities of standard game engines Standard high-level programming languages used in engine design Standard low-level programming methods Multi-threaded programming techniques Standard Application Programming Interfaces (APIs) used in game development 	<ul style="list-style-type: none"> Hardware architecture of target platforms Game graphics, game physics, artificial intelligence, sounds, user interfaces and other core functional aspects of game development Asset pipelines and game development workflows Game production processes Technical game designs Principles and concepts of engine design and development Prototyping and testing methods for game engines Typical issues, challenges and bottlenecks in engine performance 	<ul style="list-style-type: none"> Current trends in game engine technology Upcoming trends in technologies and impact on game engines Hardware architecture of intended target platforms Genres and type of games that the game engine would serve Features, functionalities and limitations of standard game engines 	
Abilities		<ul style="list-style-type: none"> Identify programming requirements for the development or customisation of specific engine modules 	<ul style="list-style-type: none"> Design programming logic for specific engine modules in collaboration with other programmers 	<ul style="list-style-type: none"> Liaise with visual graphics, design and programming teams to ideate the purpose and 	<ul style="list-style-type: none"> Envision the purpose and technical goals of the game engine 	

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		<ul style="list-style-type: none"> • Write code that fulfils the functional and technical requirements of projects • Test code to identify errors and performance issues and debug said test code • Maintain updated documentation for engine programs • Maintain specific modules of the game engine to ensure stable game development • Perform bug fixing on specific modules of existing game engines • Research coding techniques and algorithms to keep abreast of technological developments and advancements in the game industry 	<ul style="list-style-type: none"> • Write code to develop the functionalities of specific game engine modules • Review code produced by junior programmers • Create working prototypes of game engine modules to test and improve functionality • Analyse feedback from Quality Assurance (QA) and programming teams to identify areas of improvement within the game engine modules • Optimise game engine functionalities to meet target technical specifications by effecting changes to engine code • Resolve common problems in engine modules including load times, memory usage and performance issues • Support the programming team on specific engine modules 	<p>functionalities of the game engine</p> <ul style="list-style-type: none"> • Analyse the vision and technical goals of the game engine to define features and functionalities of the game engine • Liaise with visual graphics, design and programming teams to determine how to best utilise current technologies to meet game project requirements • Determine functional modules that will be part of the game engines • Ideate the technical blueprint of the engines including architecture and the interaction of various modules with each other • Communicate the programming requirements for the game engine to the programming team • Oversee the prototyping of various game modules to understand and refine functionalities • Oversee the testing of the game engine modules to understand scope for further refinements • Review the performance of the game engine against defined technical parameters 	<ul style="list-style-type: none"> • Establish the technical roadmap of the game engine • Establish guidelines and conventions for the documentation of engine programming output • Review the technical blueprint of game engines and propose modifications based on the vision and technical goals for the engines • Resolve challenging engineering and architectural problems in engine developments arising from target hardware platforms • Drive the adoption of the game engines for game development projects 	
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