SKILLS FRAMEWORK FOR INFOCOMM TECHNOLOGY
SKILLS MAP – SOFTWARE ENGINEER

Sector	Infocomm Technology
Track	Software and Applications
Sub-track	Software Engineering
Occupation	Software Engineer
Job Role	**Software Engineer**
Job Role Description	The Software Engineer leads important projects and possesses capability to make breakthroughs in design, development, testing, debugging and implementing software applications or specialised utility programs in support of end users' needs on platforms. He/She plans and coordinates regular updates and recommends improvements to existing applications. He identifies and resolves issues which have organisation wide and long-term impact. He identifies security risks, creates requirements to capture security issues, and performs initial threat modelling to ensure coding standards meets security requirements. He develops and maintains the software configuration management plan and oversees the building, verification and implementation of software releases. He provides guidance and technical support to the quality testing teams. He works in a team setting and is proficient in programming languages required by the organisation. He is familiar with software development tools and standards, as well as the relevant software platforms on which the solution is deployed on. The Software Engineer is imaginative and creative in exploring a range of application designs and solutions. He is able to engage and support others in the team, readily put forth his ideas in a clear and compelling manner.

	Critical Work Functions	Key Tasks
Critical Work Functions and Key Tasks	**Analyse user and business requirements**	Validate user requirements and design specifications
		Translate user requirements into technical specifications
		Formulate software requirement specifications
		Recommend approaches that balance security, stability, and performance needs
		Provide technical guidance on proposed solutions and alternatives
	Manage the design of software	Design software components and modules
		Determine design alternatives and perform trade-off analysis
		Create multiple views of the software system and design high-level organisation of a software system
		Facilitate software design reviews
		Lead static analysis tasks to evaluate design quality
		Develop and use simulation and prototypes to evaluate software design quality
	Manage software construction processes	Assist in the selection of processes, models, languages and tools for software construction
		Perform code re-factoring
		Review detailed designs and code to ensure quality requirements are met
		Establish project standards for designs and codes
		Leads code reviews and inspections
	Oversee software testing	Identify stakeholders participating in testing activities
		Design software test plan and criteria for regression testing
		Design the test environment and test case scenarios

		Specify test cases for the selected testing technique
		Analyse defect arrival rate and failure intensity data
	Oversee security provisions in software	Identify security risks and create requirements to capture security issues
		Perform initial threat modelling
		Model threats and associated risks of new and modified systems
		Identify the attack surface of new and modified systems
		Establish project coding standards to avoid security vulnerabilities
		Review and approve coding standards to avoid security vulnerabilities
	Manage software management configuration (SCM)	Develop and maintain the SCM plan
		Assist in specifying the SCM measures to be used
		Procure SCM tools
		Develop and tailor tools for generating SCM audit reports
		Maintain mechanisms for recording and reporting SCM information
		Oversee the building, verification and implementation of software releases
		Ensure the execution and documentation of approved changes

	Technical Skills and Competencies		Generic Skills and Competencies	
Skills and Competencies	Applications Development	Level 4	Computational Thinking	Intermediate
	Applications Integration	Level 4	Problem Solving	Intermediate
	Applications Support and Enhancement	Level 3	Lifelong Learning	Intermediate
	Budgeting	Level 3	Communication	Basic
	Business Environment Analysis	Level 3	Teamwork	Intermediate
	Business Needs Analysis	Level 3		
	Business Negotiation	Level 3		
	Business Requirements Mapping	Level 3		
	Business Risk Management	Level 3		
	Change Management	Level 3		
	Configuration Tracking	Level 3		
	Data Design	Level 3		
	Database Administration	Level 4		
	Emerging Technology Synthesis	Level 4		
	Performance Management	Level 4		
	Problem Management	Level 3		
	Product Management	Level 4		
	Project Management	Level 4		
	Quality Standards	Level 4		

	Software Configuration	Level 3	
	Software Design	Level 4	
	Software Testing	Level 3	
	Solution Architecture	Level 4	
	Stakeholder Management	Level 3	
	System Integration	Level 3	
	Test Planning	Level 3	
	User Interface Design	Level 4	
Programme Listing	For a list of Training Programmes available for the ICT sector, please visit: www.skillsfuture.sg/skills-framework/ict		

The information contained in this document serves as a guide.