SKILLS FRAMEWORK FOR INFOCOMM TECHNOLOGY
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT

TSC Category	Design and Architecture					
TSC Title	Embedded Systems Interface Design					
TSC Description	Design and set up interface and interconnections from or among sensors, through a network, to a main location, to enable transmission of information					
TSC Proficiency Description	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
				ICT-DES-4002-1.1	**ICT-DES-5002-1.1**	
				Design physical layouts reflecting connections among sensors, networks and data collection or transmitting systems, and test and fine tune them	Guide the design of sensor networks and the associated embedded systems interfaces, and verify the viability of the designed interfaces	
Knowledge				• Sensor networks concepts and principles of operation • Key components of sensor networks and their characteristics • Different types of data collection or transmitting devices, programs, systems and methods • Different types of connections among electrical and electronic devices, embedded systems, software and sensors • Application of sensors, actuators and transducers, and associated wiring systems • Usage of simulation or modelling software for sensor networks • Types and usage of tests on sensor networks • IoT system interface concepts and principles	• Methodologies and key principles in designing integrated sensor networks • Data structures in sensor networks • Various connectivity options and considerations among sensors, smart devices and other technologies • New and emerging technologies for data collection and transmission • Range of analytical or scientific simulation software • Conditions and parameters for testing viability of embedded system or sensor network • Internet of Things (IoT) guidelines and communication standards • Verification process for connection of sensors	

				• Functions and operations of virtual and/or digital databases • Security considerations for sensor networks	• Large scale monitoring and analytics applications and technologies • Types and functions of electronics in sensor networks	
Abilities				• Develop physical layouts or maps reflecting connections among sensors, networks and data collection or transmitting systems • Design interfaces among embedded systems, software and sensors • Identify the appropriate hardware devices and software programmes needed to capture and transmit desired information • Operate a set of network management tools • Calibrate embedded system devices or data collection equipment to ensure connections are stable • Utilise simulation or modelling software to model and test interconnections among devices and programs • Implement user acceptance testing to test the embedded systems interfaces and/or products • Implement embedded systems to the real world context • Tune the deployed system to ensure it	• Direct the design of embedded systems interconnections and interfaces • Examine the architecture and operating principles of data structures in embedded system interfacing • Create schematics and physical layouts of integrated sensor networks and systems • Evaluate the appropriate data capturing and transmitting technologies and tools • Evaluate operating system functions in embedded systems and/or sensor networks against user needs • Oversee the modelling and testing of interconnections among devices and programs • Establish environmental, capacity and user acceptance conditions for the testing of the embedded system network design • Verify the technical, operational and business viability of the designed sensor networks	

				delivers the expected outcome • Conduct troubleshooting of sensor network failures		
Range of Application						