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| **SKILLS FRAMEWORK FOR INFOCOMM TECHNOLOGY SKILLS MAP – EMBEDDED SYSTEMS ENGINEER** | | | | | | |
| **Sector** | Infocomm Technology | | | | | |
| **Track** | Software and Applications | | | | | |
| **Sub-track** | Embedded Systems Engineering | | | | | |
| **Occupation** | Embedded Systems Engineer | | | | | |
| **Job Role** | **Embedded Systems Engineer** | | | | | |
| **Job Role Description** | The Embedded Systems Engineer envisions, designs, implements, tests, and delivers embedded systems in a product development environment. He/She contributes to the definition of requirement, product, design specifications and collaborates with hardware team throughout the software development lifecycle. He defines innovative approaches to embedded systems development and integration of security aspects. He develops prototypes, creates software tools for test and automation, and evaluates latest technologies.  He works with a team setting and is proficient programming languages required by the organisation. He is also knowledgeable of microprocessor and microcontroller based hardware components.  The Embedded Systems Engineer is methodical in the development and integration of embedded systems, and also creative in exploring ways to enhance embedded system solutions further. He works effectively in a team, guides junior team members and is able to engage others when presenting his ideas to both internal and external stakeholders. | | | | | |
| **Critical Work Functions and Key Tasks** | **Critical Work Functions** | **Key Tasks** | | | | |
| **Identify business and user requirements** | Determine user requirements based on business needs | | | | |
| Perform requirements analysis | | | | |
| Formulate specifications on delivery platforms for embedded systems | | | | |
| Develop understanding of hardware schematics and datasheets | | | | |
| Determine approaches that balance security, stability, and performance needs | | | | |
| Identify system-level traceability requirements and tools | | | | |
| Develop project documentation, business cases, proposals, and communication materials | | | | |
| **Develop embedded systems software** | Lead the design of specific modules for development of software for embedded systems | | | | |
| Generate design specification and test cases and/or scripts | | | | |
| Define test frameworks and environments | | | | |
| Create software tools for tests and automation | | | | |
| Participate in hardware design and security architecture reviews | | | | |
| Evaluate software resilience against reverse engineering | | | | |
| Define best design practices for development and testing | | | | |
| **Optimise embedded systems** | Analyse and enhance efficiency, stability and scalability of system and resources | | | | |
| Optimise codes for implementation in various platforms | | | | |
| Develop new processes and tools to speed up the testing process | | | | |
| Recommend ways to improve performance and robustness | | | | |
| Oversee the development of technical guides for internal and external users | | | | |
| Support software quality assurance to optimise I/O performance | | | | |
| **Integrate software and hardware** | Test software and hardware interactions from prototype to manufacturing release | | | | |
| Validate the integration of software with hardware | | | | |
| Review codes and design to propose improvements | | | | |
| Diagnose and rectify technical problems in embedded software | | | | |
| Evaluate failed system scenarios | | | | |
| **Skills and Competencies** | **Technical Skills and Competencies** | | | **Generic Skills and Competencies** | | |
| Applications Development | | Level 4 | Computational Thinking | | Advanced |
| Applications Integration | | Level 4 | Lifelong Learning | | Intermediate |
| Budgeting | | Level 3 | Problem Solving | | Advanced |
| Business Environment Analysis | | Level 3 | Teamwork | | Intermediate |
| Business Needs Analysis | | Level 3 | Communication | | Intermediate |
| Business Negotiation | | Level 3 |  | | |
| Business Risk Management | | Level 3 |
| Change Management | | Level 3 |
| Configuration Tracking | | Level 3 |
| Control System Programming | | Level 3 |
| Embedded Systems Integration | | Level 4 |
| Embedded Systems Interface Design | | Level 4 |
| Embedded Systems Programming | | Level 4 |
| Emerging Technology Synthesis | | Level 4 |
| Network Configuration | | Level 4 |
| Network Security | | Level 4 |
| Performance Management | | Level 4 |
| Project Management | | Level 4 |
| Software Configuration | | Level 3 |
| Software Design | | Level 4 |
| Software Testing | | Level 3 |
| Solution Architecture | | Level 4 |
| System Integration | | Level 3 |
| Test Planning | | Level 3 |
| Vendor Management | | Level 3 |
| **Programme Listing** | For a list of Training Programmes available for the ICT sector, please visit: www.skillsfuture.sg/skills-framework/ict | | | | | |
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| The information contained in this document serves as a guide. | | | | | | |