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| **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 and Key Tasks** | **Critical Work Functions** | **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 | | | | |
| **Skills and Competencies** | **Technical Skills and Competencies** | | | **Generic 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 | | | | | |
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| The information contained in this document serves as a guide. | | | | | | |