Role Title: Software Engineer

Job Details

Job Role Description
The Software Engineer role involves researching, designing, developing, and maintaining computer software, integrating components, executing test procedures, and serving as a Subject Matter Expert in software domains.

Job Responsibilities

Job responsibility 1	Develop software applications to meet project requirements
Job responsibility 2	Collaborate with team members to design and implement software solutions
Job responsibility 3	Conduct code reviews and provide feedback to improve code quality
Job responsibility 4	Troubleshoot and debug software applications to ensure optimal performance

Job Skills and Recommended Proficiency Level

Technical Skills

Skills	Target Proficiency Level
Computer Science	3
Software Engineering	3
Agile Methodology	2
Software Development	3
Java (Programming Language)	2
Python (Programming Language)	2
SQL (Programming Language)	2
Amazon Web Services	2
JavaScript (Programming Language)	2
Application Programming Interface (API)	2

Common Skills

Skills	Target Proficiency Level
Communication	2
Problem Solving	2
Management	2
Troubleshooting (Problem Solving)	2
Leadership	2
Operations	2
Innovation	2
Writing	2
Planning	2
Research	2

Technical Job Skills and Proficiency Levels

Skills Title			
Computer Science	Knowledge of computer science and the ability to apply the knowledge in the design and development of computer software.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the basic concepts and features of computer science. Identifies the major disciplines of computer science. Explains the application of computer science in the design and development of computer software. Cites typical examples of computer science applications in the software industry.	Works with basic computer science concepts, tools and facilities. Participates in the design and development of computer software. Uses basic computer science concepts, tools and facilities to design and develop computer software. Assists in the design and development of computer software. Explains the basic concepts and features of computer science.	Evaluates the application of computer science knowledge in the design and development of computer software. Advises on the application of computer science knowledge in the design and development of computer software. Monitors the application of computer science knowledge in the design and development of computer software. Trains others on the application of computer science knowledge in the design and development of computer software. Oversees the application of computer science knowledge	Leads in the design and development of computer software. Creates a climate that fosters the application of computer science knowledge in the software design and development process. Develops computer science knowledge application standards for the software design and development process. Establishes best practices for the application of computer science knowledge in the software design and development process. Monitors the industry for new computer science knowledge and technologies.

		in the design and development of computer software.	Predicts the future trends of computer science knowledge and technologies makes recommendations for the organization.
		Designs the application of computer science knowledge in the design and development of computer software.	
Software Engineering	Knowledge of and ability to carry out the processes, tools, techniques and practices for assuring adherence to quality standards associated with developing, enhancing and operating software.		
Proficiency Levels			
Basic - 1	**Intermediate - 2**	**Advanced – 3**	**World Class - 4**
Describes the software engineering process and associated deliverables.	Works with software engineering for a specific type of software.	Evaluates the quality of software engineering processes and deliverables.	Leads the evaluation and selection of software development tools and platforms.
Identifies the major activities and checkpoints of the software engineering process.	Participates in the development of software for a specific type of application.	Advises on the use of software engineering tools and techniques.	Monitors industry and vendor experiences with software development tools and techniques.
Cites examples of software engineering standards and guidelines.	Explains the software engineering process and deliverables for a specific type of software.	Trains others on the use of software engineering tools and techniques.	Designs and develops software for a variety of platforms and environments.
Describes the roles and responsibilities of software engineers.	Uses software engineering tools and techniques for a specific type of software.	Monitors the use of software engineering tools and techniques.	Leads in the establishment of best practices for software development.
		Designs and develops software engineering tools and techniques.	Demonstrates in-depth experience with all major

	Participates in the review of software engineering deliverables.	Oversees the use of software engineering tools and techniques.	functions, features and facilities of software development. Consults on the full spectrum of software development tools and techniques.

Agile Methodology	Knowledge of Agile software development methodology and ability to apply it to diverse situations.		
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the basic concepts and features of Agile methodology.

Explains the roles and responsibilities of Agile team members.

Identifies the key principles of Agile methodology.

Cites the advantages and disadvantages of Agile methodology. | Works with a specific Agile methodology and associated tools.

Participates in the development of Agile software.

Assists in the development of Agile software.

Uses Agile methodology to develop software.

Explains the Agile methodology and associated tools. | Evaluates the effectiveness of Agile methodology recommends improvements.

Advises on the use of Agile methodology in diverse software development projects.

Trains others on the use of Agile methodology in diverse software development projects.

Monitors the use of Agile methodology in diverse software development projects.

Designs and develops software products using Agile methodology. | Leads in the design and development of Agile software development methodology.

Establishes best practices for the application of Agile methodology.

Monitors industry trends and developments in Agile methodology makes recommendations.

Creates training programs on the application of Agile methodology to diverse situations.

Develops and presents white papers on the application of |

| | | Oversees the use of Agile methodology in diverse software development projects. | Agile methodology to diverse situations.

Champions the use of Agile methodology in the organization. |

Software Development	Knowledge of and ability to utilize a variety of specific technical tools and platforms to develop and support applications.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the major functions, features and capabilities of the software development toolkit. Identifies the key components and building blocks of the software development toolkit. Cites examples of successful software development projects. Describes the purpose and use of the major software development tools.	Works with a specific software development toolkit. Participates in the development of a specific software application. Assists in the design of a specific software application. Uses a specific software development methodology. Explains the purpose and use of all major components of a specific toolkit.	Evaluates the benefits and drawbacks of alternative development tools and platforms. Advises others on the use of advanced tools and techniques for software development. Monitors the use of advanced tools and techniques for software development. Trains others on the use of advanced tools and techniques for software development.	Leads in the selection of development tools and platforms. Designs and develops interfaces to and from other applications. Monitors industry trends and directions makes recommendations. Leads in the evaluation and selection of new development tools and platforms. Creates and presents technical papers on the use of development tools and platforms.

| | | Designs and develops software for multiple platforms.

Oversees the development of software for multiple platforms. | Develops and supports multiple applications on diverse platforms. |
|---|---|---|---|
| Java (Programming Language) | Knowledge of and ability to use Java in the development and maintenance of application programs and systems. | | |

Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the purpose and use of the basic syntax and coding rules of Java.

Identifies the purpose and use of the Java Virtual Machine.

Describes the purpose and use of the Java Development Kit.

Describes the purpose and use of the Java Foundation Classes. | Uses Java to develop or maintain application programs.

Explains the purpose and use of Java packages. | Evaluates the performance of Java programs and recommends improvements.

Advises others on the use of Java in diverse environments and applications.

Monitors the use of Java in the development of web-based applications.

Trains others on the use of Java in diverse environments and applications.

Evaluates the benefits, drawbacks, strengths and weaknesses of Java. | Leads in the design and development of Javabased applications for diverse environments.

Designs and builds interfaces to and from other languages and platforms.

Monitors Java trends and assesses implications for inhouse production environment.

Trains others on the use of Java in diverse environments and applications.

Designs and builds Java-based applications for diverse environments. |

		Designs and develops interfaces to and from other languages.	Leads in the development of Java best practices for application design and performance.

Python (Programming Language)	Knowledge of and ability to use Python in the development and maintenance of production software.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the purpose and use of Pythons built-in functions. Explains the purpose and use of Pythons built-in functions.	Uses Python to develop or maintain software applications. Explains the use of Python for web development, scientific computing, and artificial intelligence. Follows Python coding standards and best practices. Works with Python libraries to extend the languages functionality. Participates in the development of Python-based software applications.	Evaluates the performance of Python programs recommends and implements improvements. Trains others in the use of Python for web development. Advises on the use of Python for web development. Designs and develops web applications using Python. Monitors the use of Python in the development of web applications. Oversees the use of Python in the development of web applications.	Monitors Python trends and assesses implications for inhouse production environment. Designs and builds interfaces to and from other languages. Trains others on use of Python in diverse environments and applications. Leads in the design and development of Python enhancements and migration strategies.

SQL (Programming Language)	Knowledge of and ability to use SQL (Structured Query Language) to manage, query, and manipulate data in a relational database.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the purpose and use of SQL commands. Identifies the purpose and use of SQL data definition language. Explains the purpose and use of SQL data manipulation language. Describes the purpose and use of SQL data query language.	Uses SQL to create and maintain tables, indexes, views, and stored procedures. Uses SQL to insert, update, and delete data in a database. Uses SQL to create and maintain triggers. Uses SQL to create and maintain indexes. Uses SQL to create and maintain views.	Evaluates the performance of inhouse SQL applications recommends and implements improvements. Trains others in the use of SQL for database management and application development. Advises others on the use of advanced SQL features and facilities. Designs and develops stored procedures and triggers in SQL. Monitors the use of SQL in diverse environments and applications. Oversees the use of SQL in diverse environments and applications.	Leads in the design and development of SQL-based applications. Monitors SQL trends and assesses implications for inhouse production environment. Designs and builds interfaces to and from other languages. Trains others on use of SQL in diverse environments and applications. Designs and develops SQL enhancements and migration strategies.

Amazon Web Services	Knowledge of and ability to use Amazon Web Services (AWS) to develop and support applications.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the purpose and use of AWS in general terms.

Identifies the major AWS services and their functions.

Describes the AWS pricing model and basic cost structure.

Explains the concept of elasticity as it applies to AWS. | Works with basic AWS services.

Uses AWS to develop and support applications.

Explains the basic concepts of cloud computing and AWS.

Participates in the implementation of AWS services.

Assists in the development of AWS applications. | Evaluates the benefits and drawbacks of using AWS for a specific application.

Advises on the use of AWS for mission-critical applications.

Designs and develops applications that use multiple AWS products and services.

Trains others on the use of AWS for application development and support.

Monitors the use of AWS ensures compliance with security and other policies.

Evaluates the costs and benefits of using AWS for a specific application. | Leads in the design and development of AWS-based applications.

Monitors AWS trends and assesses implications for inhouse production environment.

Designs and develops interfaces to and from other cloud services.

Leads in the establishment of best practices for AWS application design and development.

Creates and presents business cases to justify the use of AWS for specific applications.

Trains others on the use of AWS in diverse environments and applications. |

JavaScript (Programming Language)	Knowledge of and ability to use JavaScript in the development and maintenance of websites and web applications.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the purpose and use of the Document Object Model DOM. Describes the purpose and use of the JavaScript Object Notation JSON. Explains the purpose and use of the JavaScript Engine. Describes the purpose and use of the JavaScript Application Programming Interface API.	Uses JavaScript to create and manipulate objects, write functions, and handle events. Uses JavaScript to validate web page forms. Uses JavaScript to change the content of a web page. Uses JavaScript to create cookies. Uses JavaScript to detect the visitors browser.	Evaluates the performance of inhouse developed JavaScript applications. Advises on the use of JavaScript in diverse environments and applications. Monitors the use of JavaScript in the development of web applications. Trains others in the use of JavaScript in diverse environments and applications. Designs and develops interfaces to and from other applications. Oversees the use of JavaScript in the development of web applications.	Monitors JavaScript trends and assesses implications for inhouse production environment. Designs and develops interfaces to and from other applications. Trains others on use of JavaScript in diverse environments and applications. Leads in the design and development of JavaScript architecture and applications.

Application Programming Interface (API)	Knowledge of the full range of activities related to designing, developing, implementing and maintaining application software within an organization.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the purpose and use of API in the development of application software. Identifies the key features and functions of API. Explains the concepts and principles of API. Lists the common types of API.	Works with a specific API to develop or support an application. Uses API to access and manipulate data in a database. Explains the purpose and use of API documentation. Follows API design and development standards and procedures. Participates in the development of an API for a specific application.	Evaluates the benefits and drawbacks of alternative API design and implementation approaches. Advises on the use of API in diverse environments and applications. Trains others on the use of API in diverse environments and applications. Designs and develops API for diverse environments and applications. Monitors the organizations API development and implementation activities. Oversees the organizations API development and implementation activities.	Leads in the design and development of APIs for multiple applications. Monitors industry trends and developments in API design and development. Designs and develops APIs for multiple applications. Develops best practices for API design and development. Creates training programs on the use of API for multiple applications. Leads discussions on the history and future of API design and development.

Common Job Skills and Proficiency Levels

Communication	Knowledge of the communication strategies and ability to effectively inform, explain, and advise through written and oral communication in a clear, concise, and professional manner.		
Proficiency Levels			
Basic - 1	**Intermediate - 2**	**Advanced – 3**	**World Class - 4**
Describes the key elements of effective communication. Identifies the key elements of effective communication. Explains the importance of effective communication. Cites examples of effective and ineffective communication.	Uses appropriate language, style, and presentation for intended audience. Uses appropriate channels for communicating. Participates in meetings and presentations. Explains the importance of nonverbal communication. Uses appropriate body language and gestures.	Evaluates the effectiveness of communication strategies and makes recommendations for improvement. Advises others on the use of different communication strategies for different audiences. Designs and develops communication strategies for a variety of audiences. Monitors the organizations communication practices and makes recommendations for improvement. Trains others on the use of different communication strategies for different audiences.	Leads in the development of communication strategies for the organization. Designs and develops communication programs for a variety of audiences. Creates a climate that encourages open communication. Establishes best practices for effective communication. Monitors industry trends and developments in communication. Develops and implements communication training programs.

| | | Oversees the development of communication strategies for a variety of audiences. | |

Problem Solving	Knowledge of approaches, tools, techniques for recognizing, anticipating, and resolving organizational, operational or process problems; ability to apply this knowledge appropriately to diverse situations.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the basic concepts of problem solving. Identifies the key steps in the problem solving process. Explains the importance of defining a problem before attempting to solve it. Cites examples of problems that have been solved.	Works with others to identify and define problems. Assists in gathering information and determining cause of a problem. Uses appropriate problem solving and decision-making processes. Follows up to ensure that problems are resolved. Participates in brainstorming, data gathering, and analysis activities to generate and select solutions.	Evaluates alternative solutions and assesses the impact of the selected solution. Advises others on how to apply problem solving approaches and tools. Monitors the effectiveness of problem solving efforts and the efficiency of problems solving tools. Designs and develops approaches, tools, and techniques for solving organizational, operational or process problems. Trains others on the use of problem solving tools and techniques.	Leads in the design of problem solving approaches, tools, and techniques. Establishes problem solving standards, policies, strategies, and best practices. Monitors industry and marketplace experiences with problem solving. Develops problem solving training programs for the organization. Creates problem solving case studies for the organization. Demonstrates a high level of proficiency in problem solving.

		Oversees the resolution of complex or unusual problems.	

Management	Knowledge of and ability to plan, organize, monitor and control It-related activities and resources.		

<table>
<tr><td colspan="4" align="center">Proficiency Levels</td></tr>
<tr><td>Basic - 1</td><td>Intermediate - 2</td><td>Advanced – 3</td><td>World Class - 4</td></tr>
<tr>
<td>Describes the roles and responsibilities of It management and staff.

Identifies the major functions and activities of It management.

Cites examples of It management practices and issues.

Describes the purpose and content of It management reports.</td>
<td>Works with a manager to develop a plan for a specific project.

Participates in the planning and monitoring of IT projects.

Assists in the development of IT project plans.

Uses IT project management tools and techniques.

Explains the concept of critical path and its relevance to IT project management.</td>
<td>Evaluates the effectiveness of management practices and processes.

Advises on the use of alternative management approaches and tools.

Monitors the organizations management practices recommends improvements.

Designs and develops management practices and processes.

Trains others on the use of management practices and processes.

Oversees the organizations management practices and processes.</td>
<td>Leads in the development of best practices for IT management.

Designs and develops management processes and practices.

Creates and monitors management reports and metrics.

Leads in the design and development of IT management processes and practices.

Develops and monitors management budgets.

Establishes management standards, policies, and guidelines.</td>
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Troubleshooting (Problem Solving)	Knowledge of approaches, tools, techniques for recognizing, anticipating, and resolving organizational, operational or process problems; ability to apply this knowledge appropriately to diverse situations.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the basic steps of a systematic approach to problem solving.

Identifies the key features of a problem.

Explains the importance of defining a problem before attempting to solve it.

Cites examples of common problems and associated solutions. | Works with others to identify and resolve a variety of existing and potential problems and issues.

Follows through on problem resolution.

Uses a systematic approach to problem solving.

Explains the importance of defining a problem before attempting to solve it.

Uses a variety of problem solving techniques. | Evaluates the effectiveness of alternative solutions to problems.

Advises others on the use of a variety of problem solving approaches and techniques.

Designs and develops alternative solutions to problems.

Monitors the organizations problem solving practices and procedures.

Trains others in the use of problem solving techniques.

Oversees the resolution of complex or unusual problems. | Leads in the design and development of troubleshooting processes and practices.

Establishes best practices for troubleshooting monitors and improves.

Creates a climate that encourages creative problem solving.

Demonstrates the ability to resolve complex problems in a timely and efficient manner.

Develops and implements mechanisms for monitoring and measuring problem resolution.

Designs and develops tools and techniques for recognizing and anticipating problems. |

Leadership	Knowledge of effective leadership theories and techniques; ability to lead, coach, and develop a team of individuals.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the roles and responsibilities of a leader. Identifies the characteristics of a good leader. Explains the importance of leadership in the workplace. Cites examples of effective and ineffective leadership.	Demonstrates leadership in a specific area or on a specific project. Explains the concept of situational leadership. Uses a variety of leadership styles as appropriate. Participates in the development of a team. Works with a team to achieve a specific goal.	Evaluates the effectiveness of leadership in a variety of situations. Advises others on the use of leadership in a variety of situations. Monitors the use of leadership in a variety of situations. Designs leadership training programs. Develops leadership training programs. Oversees the use of leadership in a variety of situations.	Leads in the development of leadership strategies and practices for the organization. Designs and implements leadership development programs. Creates a work environment that encourages and rewards leadership behaviors. Establishes a vision and direction for the organization. Monitors industry and marketplace leadership practices and trends. Develops leadership competencies for the organization.

Operations	Knowledge of and ability to use the day-to-day operations of a business to ensure effectiveness in the production and delivery of products and services.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the basic functions of the operations department. Identifies the key activities and responsibilities of the operations function. Cites examples of operational issues and considerations. Describes the role of operations in the organization.	Works with the daytoday operations of a business. Assists in the development of business operations plans. Uses the basic tools and techniques for business operations. Explains the key issues and considerations for business operations. Participates in the implementation of business operations plans.	Evaluates the effectiveness of current operations and makes recommendations for improvements. Advises on the use of advanced tools and technologies for operations management. Designs and implements the processes and procedures for operations management. Trains others on the use of advanced tools and technologies for operations management. Monitors the use of advanced tools and technologies for operations management. Oversees the day-to-day operations of a business.	Leads in the development of best practices for operations. Designs and develops the organizations operations. Creates a system to monitor the effectiveness of operations. Develops a system to ensure the quality of operations. Establishes standards for the evaluation of operations. Predicts the future trends of operations.

Innovation	Knowledge of the importance of innovation and ability to apply it to diverse situations.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the organizations approach to innovation. Cites examples of innovative products, services or processes. Identifies the key benefits of innovation. Explains the concept of innovation in business terms.	Works with others to develop new ideas. Participates in the implementation of new ideas. Assists in the development of new ideas. Uses new ideas to solve problems. Follows established processes for developing new ideas.	Evaluates the effectiveness of innovation in the organization. Advises on the use of innovation in different situations. Monitors the organizations innovation activities and results. Designs training programs on the use of innovation in the organization. Develops new approaches to innovation in the organization. Oversees the use of innovation in the organization.	Leads in the development of new products, services, or processes. Designs and implements mechanisms to encourage innovation. Creates a climate that encourages innovation. Establishes best practices for innovation. Monitors and evaluates the effectiveness of innovation. Develops a theoretical understanding of innovation.

Writing	Knowledge of the full spectrum of written communications and ability to effectively write various technical and business documents.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the basic concepts of writing.

Identifies the key elements of a written document.

Cites examples of effective and ineffective writing.

Explains the importance of proper grammar, punctuation, and spelling. | Writes in a clear, concise, organized and convincing manner.

Writes for a specific audience and purpose.

Uses appropriate tone, style, language and grammar in writing.

Writes in a manner that is consistent with the organizations style and standards.

Uses a variety of sentence structures and lengths to make writing more interesting. | Evaluates the effectiveness of writing in terms of the intended audience and purpose.

Advises others on the use of language, tone, and style in writing.

Monitors the quality of writing in terms of grammar, punctuation, and spelling.

Develops and designs a variety of technical and business documents.

Trains others on the use of writing in a variety of technical and business documents.

Oversees the writing of technical and business documents. | Leads in the development of writing strategies for the organization.

Designs and develops writing training programs for the organization.

Creates a system to monitor the effectiveness of writing in the organization.

Develops a theoretical understanding of writing and its impact on the organization.

Establishes best practices for writing in the organization.

Predicts industry trends and developments in writing. |

Planning	Knowledge of and ability to develop a blueprint for achieving desired results.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the basic concepts of planning. Identifies the key elements of a plan. Explains the purpose of a plan. Cites examples of planning in own area.	Works with others to develop a plan for a specific project or activity. Uses planning tools and techniques to develop a plan. Participates in the development of a plan. Assists in the development of a plan. Explains the purpose and scope of a plan.	Evaluates the effectiveness of planning processes and tools recommends improvements. Advises others on the use of alternative planning tools and techniques. Designs and develops plans for multiple functions, departments, or organizations. Trains others on the use of planning tools and techniques. Monitors the planning activities of multiple functions, departments, or organizations. Oversees the planning process for multiple functions, departments, or organizations.	Leads in the development of strategic plans for the function or business unit. Designs and develops planning processes and tools. Establishes best practices for planning. Monitors industry and marketplace planning trends and directions. Develops and presents business cases for strategic initiatives. Creates a climate that supports planning.

Research	Knowledge of and ability to use various techniques for conducting research.		
Proficiency Levels			
Basic - 1	Intermediate - 2	Advanced – 3	World Class - 4
Describes the purpose and use of a specific research technique. Identifies the key activities and deliverables of a research project. Cites examples of research projects and their results. Names key research resources and sources of information.	Assists in the development of research studies. Uses a specific research technique to gather information. Works with a specific research technique. Follows established research processes and procedures. Explains the purpose and use of a specific research technique.	Evaluates the validity and reliability of research studies. Advises others on the selection of research methods and techniques. Designs and develops research studies. Monitors the research activities of others. Trains others on the use of research methods and techniques. Oversees the research activities of the department.	Leads in the development of new research techniques and tools. Designs and develops research studies for the organization. Creates a climate that encourages the use of research to support business decisions. Establishes best practices for the use of research in the organization. Monitors industry and marketplace trends and directions in research. Develops a theoretical understanding of the research process.