

Software Developer

ROLE OVERVIEW

You are the technical designer and developer of software applications and systems.

As a software developer you are responsible for researching, analyzing, and evaluating the requirements for existing or new software applications and systems. You are expected to design, develop, test, and maintain software while providing new and innovative solutions to meet these requirements.

You may work in a variety of different industries, researching, developing, and testing software and systems for commercial, industrial, military, or scientific use. You will work towards understanding the client's needs, conducting extensive research into the feasibility of the project. Examining the costs, technical specifications, and potential risks of applications.

You must have exceptional attention to detail and analytical skills to be successful as software developer. You must have an iterative approach to problem solving, understanding the importance of validating and verifying results to ensure accuracy. Although a technical skill set is highly important, you must also have the interpersonal skills to collaborate with other developers, engineers, and technicians, in addition to managing the expectations of customers and stakeholders.

STRATA LEVEL: 3A – Manager

Also Known as:

- Application Programmer
- Business Application Programmer
- Software Developer
- Scientific Programmer

Education and Experience:

- A bachelor's degree in computer engineering, electrical or electronics engineering, engineering physics or computer science.
- A master's or doctoral degree in a related engineering discipline may be considered an asset.
- Licensing by a provincial or territorial association as a Professional Engineer (P.Eng.) may be considered an asset.

Associated NOC(s):

- **2174** – Computer Programmers and Interactive Media Developers



TECHNICAL



Software and Systems Research

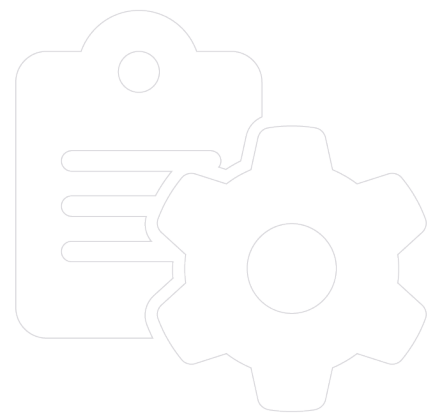
Research and updates knowledge and skills related to computer software and systems to keep up with technological advancements and recommend latest innovations or product improvements.

- Conducts comprehensive review of information and publications to ensure a complete understanding of a subject prior to development.
- Research emerging aspects in software and technological applications to recommend new applications and procedures when available.
- Assesses user requirements prior to undertaking projects to develop software applications or operating systems to meet user needs.
- Conducts market research using techniques and tools to elicit, define, or document user requirements for system or product.

Software Feasibility Assessment

Assesses and evaluates software specifications to determine the feasibility of new or existing systems configurations to meet user requirements, and client goals (internal and external).

- Identifies the functional and non-functional requirements, constraints, and possible use cases of software to achieve positive interactions between users and software.
- Specifies the technical properties of goods, materials, methods, processes, systems, software, and functionalities required to achieve customer or organizational requirements.
- Shares input on the financial or social costs and benefits of a software project or investment to assess the feasibility of design for a client or organization.
- Deliberates with other engineering staff to evaluate interface between hardware, software, operational, and performance requirements of system.



Software Application Design

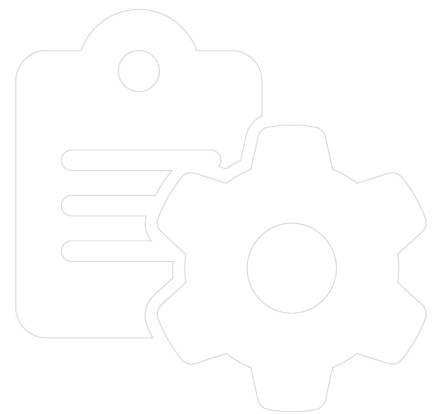
Transposes a series of requirements into a clear and organized software design for the purposes of creating an application or system.

- Considers client requirements, target environment, user, and security requirements to develop software designs.
- Uses process simulation software, flowcharting, scaling models and other tools to identify the workflow and resource requirements for a particular process to enable the creation of an application or system.
- Composes flowchart diagrams using connecting lines and symbols to illustrate the systemic progress in a procedure or systems to communicate a visual process of the system or application.
- Uses reusable solutions and formulized best practices to solve common ICT tasks in software design and development to create efficient solutions.
- Develops a preliminary version of a software application or operating system to simulate aspects of the final product to present conceptual idea to client or organization.
- Composes a higher-level design to describe the purpose and scope of the project, flow of components, and integration points to be transformed into a physical design.
- Creates test cases to verify product functionality to ensure the product has no errors and all requirements are completed before releasing to the consumer.
- Develops a software design description to provide a representation of a software design to be used for recording design information, deliberating design concerns, and communicating design information to stakeholders.

Systems Integration

Participates in systems integration processes to merge component sub systems into one system to ensure that the sub systems function together as a complete system.

- Consults with engineering staff to evaluate interfaces between hardware and software to plan the integration of software and hardware.
- Uses integration techniques and tools to plan and implement the integration of hardware and software.
- Applies specific testing techniques throughout the integration process to ensure system integrity during integration.



Computer Programming

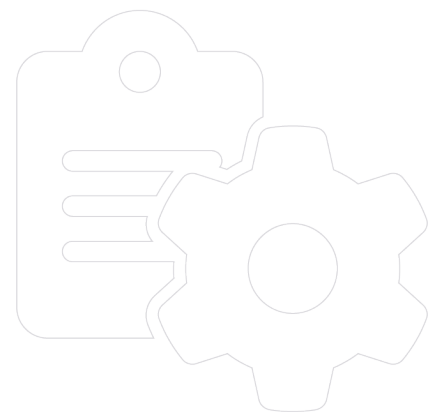
Uses programming languages to write code to instruct a computer which actions to perform and in which order.

- Uses a device driver to provide software interfaces to hardware devices to enable operating systems and other computer programs to access hardware functions.
- Applies an appropriate programming language to create automation scripts, code and processes to train neural nets to achieve faster workflow.
- Applies appropriate programming languages to express rules and facts about a problem in logical form to solve problems or verify correctness.
- Compare and contrast cloud computing concepts to enable ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources.
- Writes code with no particular structure to fulfil a specific utility without regard to any other aspect in the design process.
- Writes code to organize a program around abstract data structures, that combines data and the methods used to access or manipulate data, so objects interact with each other to collectively fulfil the desired functions.
- Writes code to isolate secondary or supporting functions from the main programs function to resolve object tangling and scattering associated with object-oriented programming.
- Evaluates program as a mathematical function to avoid state and mutable data to solve programming problems.

Software Testing

Conducts simulations, tests, or modelling of software to determine strengths and weaknesses of design, improve design solutions, and ensure reproducibility.

- Performs a requirement analysis to define the expectations of the end user's software application.
- Documents and describes the test objectives, schedules, estimations, deliverables, and resources required to perform a test on a software application to determine the efforts required to validate an application.
- Maps out test program and software design to ensure that the performed test activities are the most efficient and effective tests for the systems under testing.
- Collaborates with others to perform different types of testing to ensure quality control and assurance of the product.



Software Modification/Debugging

Improves software or technical systems by amending codes, correcting faults, or upgrading programs to improve product functionality or maintain systems.

- Analyzes software testing results to identify defects in software to correct inputs, outputs, or unexpected results.
- Repairs defects identified in testing analysis to ensure accurate application outputs to ensure a functional product or system.
- Participates in peer code reviews by providing comments and feedback on software development to improve applications and team synergy.
- Identifies error types and applies appropriate method or technique to debug software and correct error to maintain usability of system.

ICT Maintenance

Uses appropriate procedures, methods, and techniques to maintain data and ICT systems to minimize disruptions to productivity so that business operations are sustained.

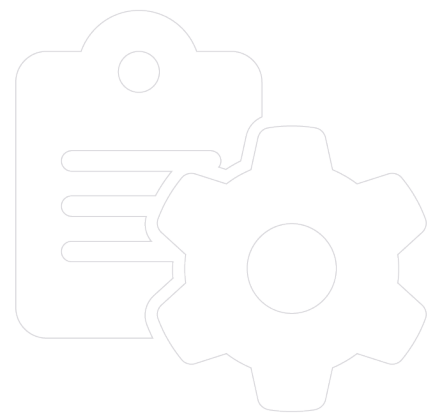
- Develops automated migration methods to transfer ICT information between storage types, formats, and systems to reduce the resources required to perform the task manually.
- Applies migration and conversion methods for existing data to transfer or convert data between formats, storage, or systems to ensure organizations or clients information is maintained.
- Monitors system's functions to ensure system operates in conformance with specifications to minimize user disruptions.
- Documents system maintenance procedures and previous techniques used to resolve application problems to reduce time spent on future errors.



Project Team Management

Oversees a team of professionals to effectively and efficiently produce the required output to ensure project[s] are completed on time and budget.

- Provides direction and supervision to engineers, technicians, and technologists in the design and development process to ensure clear and effective channels of communication across all departments.
- Monitors and controls the allocation of resources and reassigns staff as needed to support project deliverables.
- Sets clear accountability targets for supervised personnel to achieve project deliverables.
- Manage tasks and projects according to approved scopes of work to deliver quality reports on schedule and within budget.



PERSONAL AND PROFESSIONAL



Communication

Positively directs outcomes by delivering communication that results in a better understanding of goals and objectives and that capture interest and gain support for immediate action.

- Prepares documentation for existing and upcoming products to describe functionality and composition to communicate technical specifications to a wide audience in plain language.
- Confers with systems analysts, engineers, programmers, or other staff to share information on project limitations and capabilities.
- Develop and maintain relationships with clients and customers to ensure optimum customer service and maintenance of contract requirements.
- Shares valuable ideas in group meetings or discussions to improve system requirements or design functions of applications or systems.

Collaboration

Engages in professional collaborative efforts with other members of the team, including sharing information and expertise, utilizing input from others, and recognizing others' contributions to work towards a common goal.

- Consults with engineering staff to evaluate interfaces between hardware and software.
- Works cooperatively with multiple stakeholders, demonstrating a willingness to consider alternative approaches, ideas, or insights.
- Work in partnership with other practitioners, both internal and external, to execute projects.
- Shares relevant and useful knowledge, experience, or expertise to aid team members accomplish their objective more efficiently or effectively.



Problem Solving

Identifies problems and uses logic, judgement, and evidence to evaluate alternative scenarios and recommend solutions to achieve a desired goal.

- Simplifies complex ideas and technical concepts into accessible information to communicate with stakeholders, senior management, and team members.
- Takes an unbiased stance to interpreting new information to solve a problem in an object manner.
- Identifies relationships between components and systems to come up with solutions to resolve problems.
- Applies logical and iterative analysis to evaluate events and outcomes.

Attention to Detail

Reviews completed work by monitoring and checking information, organizing tasks and resources efficiently, or all areas involved towards the completion of an objective.

- Scrutinizes models, tests, and simulation results to ensure validity and accuracy in results or findings.
- Routinely expresses concern that procedures and standards are followed thoroughly in the completion of a task[s].
- Double checks the accuracy of information and work to provide accurate and consistent work.
- Catches and corrects own errors or omissions, where applicable, to ensure efficiency and safety.



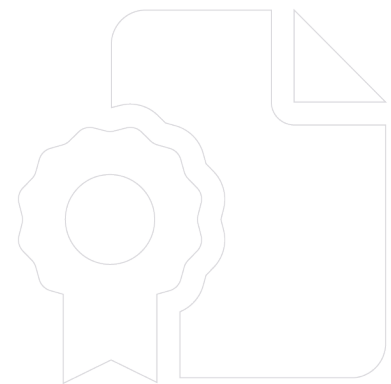
LEGAL, REGULATORY, AND POLICY



Regulatory Compliance

Adheres to specific regulations, codes, and legislation within a defined jurisdiction to ensure the health and safety of others.

- may be requirements around redundancy and fail-over
- ; requirements concerning the user interface (for example there are requirements around Rutter's marine display in terms of brightness controls
- the use of certain colors that have special meaning; and font sizes
- regulations around % code coverage of test programs to ensure robustness in the field.
- around understanding applicable government and industry regulations around the use and robustness of the software application to ensure conformance of the design.



ENVIRONMENTAL



Insert

Insert.

- *Insert.*

Aquatic Stock Production Management

Insert.

- *Insert.*

