

Robotician

ROLE OVERVIEW

You are a key technical engineer and designer of intelligent systems and robotics devices, utilizing knowledge of computer science, mechanics, and electrical engineering.

As a robotician you are responsible for researching, designing, developing, and integrating robotic or autonomous systems that contribute to improving efficiency, operational performance, or safety. You are expected to manage autonomous systems and robotics applications while providing new and innovative solutions to improve operational performance.

You may work for a variety of different organizations, in a range of robotics disciplines such as operator interfaces, locomotion, manipulators, sensors, or programming. You will work to understand the organizations or client's needs, conducting research and testing on the feasibility of the project, examining the technical possibilities, and potential risks and benefits of design.

You must have problem-solving skills to identify the root cause of a problem or systems error, having the capacity to examine problems from multiple different perspectives. Problem-solving in this role requires open mindedness and a willingness to collaborate and communicate effectively with other technical staff, decision makers, and external stakeholders to achieve long term success.

STRATA LEVEL: 3B – Technical Specialist

Also Known as:

- Robotics Engineer
- Mechatronics Engineer
- Automation Engineer
- Robotics Engineering Consultant
- Robotics System Engineer
- Robotic Technology Engineer

Education and Experience:

- A bachelor's degree in robotics, mechanical, or electrical engineering is required.
- A master's or doctoral degree in a related discipline may be required.
- Licensed by a provincial or territorial association as a Professional Engineer (P.Eng.).

Associated NOC(s):

- 2132 – Mechanical Engineer



TECHNICAL



Engineering Design

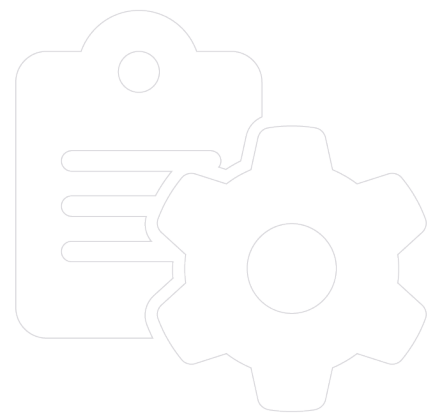
Responsible for the technical aspects of the planning and design of engineering project[s] to ensure project is constructed in a safe, efficient, and effective manner.

- Defines the engineering-related problem or opportunity and potential risk and benefits of project proposal[s] to senior management and stakeholders so that project proposal can be approved and implemented.
- Proposes technical design or process changes to improve efficiency, quality, or performance of products, structures, systems, or facilities.
- Leads the design of automated robotic systems, such as automatic vehicle control, autonomous vehicles, advanced displays, advanced sensing, robotic platforms, computer vision, or telematics systems to increase production volume or precision in high-output operations.
- Maintain, test, and upgrade hardware and software systems installed on autonomous systems or robotics components to maintain efficiency and operational performance.
- Adjusts product designs to ensure that products or parts of a project meet organizational and regulatory requirements.
- Prepares complete technical drawings with sufficient details and specifications to ensure the effective and safe construction of products, structures, systems, or facilities.

Engineering Review and Analysis

Reviews and analyzes relevant information pertaining to technical designs and complex systems to develop appropriate solutions.

- Works with other technical staff to adjust designs of products, parts, or systems to ensure that they meet the industry standards and specifications for operations.
- Reviews the technical designs of junior engineers and other technical staff to ensure accuracy and provide quality control and feedback to improve products, parts, or systems.
- Gives consent to the finished engineering products so that products can be manufactured and assembled.
- Evaluates the potential to adopt or integrate autonomous systems or robotics solutions to improve efficiency, operations, quality, or performance of a product, part, or system.



Feasibility Analysis

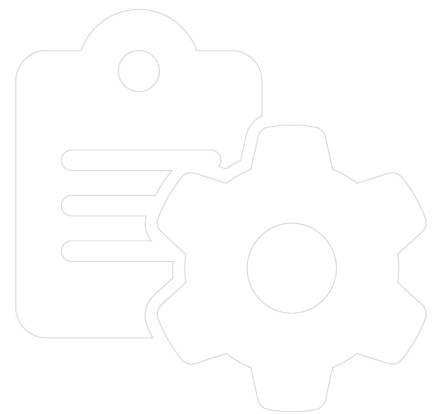
Produces a feasibility analysis of the practicality of a proposed project[s] including the economic viability, associated costs and benefits, and technical and time constraints of the project to ensure projects are completed on time and on budget.

- Conduct research into the feasibility, design, operation, or performance of robotic mechanisms, components, or systems to ensure concepts can be transformed into real world applications.
- Assesses the requirements for a project such as their budget appraisal, expected turnover, and risk assessment for determining the benefits and costs of the project.
- Contributes to the technical assessment of the project agreement to provide input on project feasibility to calculate if the organization will redeem its investment, and whether the potential profit is worth the financial risks.

Computer Programming

Uses specialized software to develop code to instruct a computer, application, or software program how to perform under specific conditions so that applications or software function appropriately.

- Uses specialized tools and software to develop a control schema to program a machine interaction in a specified environment.
- Uses specialized tools to create automation scripts, code, and processes to train neural nets to achieve faster workflow.
- Uses robot control software to implement a set of commands to instruct a machine what tasks to perform.
- Identifies error types and applies appropriate method or technique to debug software and correct error to maintain usability of system.
- Repairs defects identified in testing analysis to ensure accurate application outputs to ensure a functional product or system.
- Works with software developers to improve automation of the workflow and develop tools to reduce bottlenecks.



Scientific Research

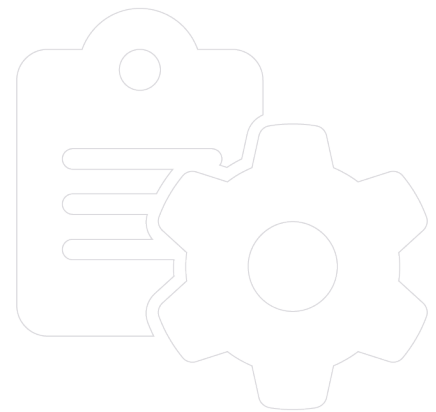
Applies scientific methods and techniques using empirical and/or measurable observation in their research to improve, correct or increase knowledge in a field of study to solve specific problems.

- Conducts comprehensive review of information and publications to ensure a complete understanding of a subject prior to development.
- Research emerging aspects in robotics and technological applications to recommend new applications and procedures when available.
- Conduct research on robotic technology to create new robotic systems or system capabilities.
- Research advanced engineering designs or applications to improve knowledge base to ensure design output is building on industry standards.

Robotics Management

Oversees the planning, production, and integration of robotic machines, components, or autonomous systems to ensure adequate quality and performance according to engineered specifications.

- Direct production activities to ensure that components or products are made on time, in correct order, of adequate quality and composition.
- Measure the performance of the components, sensors, and devices to provide feedback to other departmental teams to improve product(s).
- Maintain, test, and upgrade hardware and software systems installed on autonomous systems or robotic machinery to ensure adequate performance.
- Creates backups of robotics programs or sensor data to create a copy of sensitive information in the event of a primary data failure.
- Measures output and compares results with reference data to adjust the reliability and function of a robotic instrument.
- Develops software tools to monitor the performance of components to document findings and troubleshoot issues.
- Investigate mechanical failures or unexpected maintenance problems to develop solutions to correct future problems.



Prototype Development

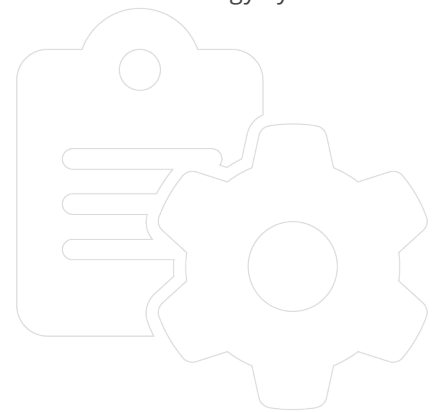
Design prototypes of products or components of products by applying design and engineering principles to showcase the future product and test potential innovations to enhance market competitiveness.

- Applies working or theoretical models throughout the design, testing, and modification process to test against product prototypes.
- Conduct experimental, environmental, and operational tests on models, prototypes or on the systems and equipment itself to test their strength and capabilities under normal and extreme conditions.
- Simulate mechatronic design concepts through creating mechanical models and performing tolerance analysis.
- Integrates feedback form client and test data to refine prototype to improve end design.

Advanced Manufacturing Technology

Program, assemble, and install advanced manufacturing technologies, devices, components, or systems according to engineering specifications to improve organization performance and competitiveness.

- Create back-ups of AMT programs or parameters to prevent data loss and ensure settings can be restored in the event of a failure.
- Follows engineered designs and instruction to assemble robotic machines, devices, and components.
- Program necessary components of robotic systems, such as robot controllers, conveyors, and end-of-arm tools to integrate AMT into existing systems or equipment.
- Investigate new technologies and integrate AMT with existing process to improve production rates, efficiencies, yields, and costs.
- Use mechanical, pneumatic, hydraulic, electrical, electronic, and information technology systems and components to assemble AMTs to improve processes and develop solutions.
- Use computer-aided manufacturing (CAM) programmes to control machinery and machine tools in the creation, modification, analysis, or optimization of computer hardware components.
- Use computer-aided design (CAD) systems to assist in the creation, modification, analysis, or optimization of a design.



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.

- Maintains communications with the team, as well as external stakeholders, to exchange information, assess progress and reassign work as needed.
- Leads presentations to technical and non-technical colleagues and clients to convey project plan and progress.
- Provides clear instructions, information, and duties to supervised employees to ensure employees clearly understand their position.
- Explains novel or complex engineering concepts and related facts in an appropriate manner to an audience to explain aspects of the design process and/or proposal.

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.

- Liaises with intra-departmental teams to establish priorities and provide general engineering support.
- Encourages other team members to assist one another by expressing others contribute their knowledge, expertise, or efforts to achieve objectives.
- Works cooperatively with multiple stakeholders, demonstrating a willingness to consider alternative approaches, ideas, or insights.
- Provides team members with constructive feedback and perspective to aid in the completion of a task or goal.



Problem Solving

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

- Analyzes operational data to evaluate operations, understand trends, and potential areas of concern to take appropriate action where required.
- Takes an unbiased stance to interpreting new information to solve a problem in an object manner.
- Considers all pieces of information when attempting to solve problems to produce a cognisant and comprehensive solution.

Attention to Detail

Delivers a concentrated concern, including monitoring and checking information, organizing tasks and resources efficiently, or all areas involved towards the completion of an objective.

- Provides accurate, consistent information on all pieces of work to ensure reliable results.
- Catches and corrects own errors or omissions, where applicable, to reduce future performance issues so that software products, systems, interfaces, or applications operate as expected.
- Routinely checks in with client to take into consideration changing priorities or expectations to produce results that improve relationships and business objectives.



LEGAL, REGULATORY, AND POLICY



Protecting Public Interest

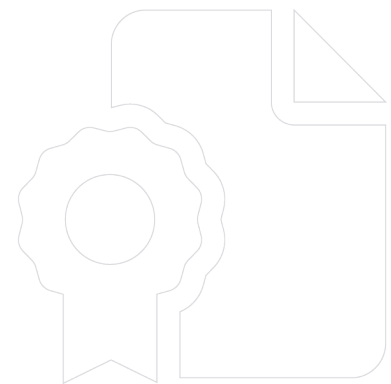
Weighs the impacts of engineered designs to life, health, property, economic interests, and the environment to ensure products or systems are in the best interest of public life.

- Assesses relevant regulations, legislations, and standards to ensure project complies with laws, regulations, and standards.
- Demonstrate knowledge of regulations, codes, standards, and safety, including local engineering procedures and practices to ensure the safe operation of facilities and systems.
- Applies engineering codes and statutes, of a defined jurisdiction, in the design process to ensure a safe workplace.
- Assesses the safety concerns and potential risks related to engineering activities to identify hazards and considers appropriate solutions to mitigate them.

Health and Safety Procedures

Adheres to and advocates specific workplace safe operating procedures and occupational health and safety requirements within a defined jurisdiction to ensure the health and safety of others.

- Establishes safeguards and best practices within a project team to align with organizational health and safety plan to ensure the safety of all team members.
- Applies appropriate health and safety procedures in all aspects of work to ensure zero-incidents.
- Documents any and all workplace incidents and accidents to ensure hazards are reduced.



ENVIRONMENTAL



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