

COMPETENCY PROFILE:

ROBOTICS TECHNICIAN

ROLE OVERVIEW

Robotics technicians are crucial in building, installing, operating, monitoring, and repairing automated and electromechanical equipment.

They are responsible for maintaining and operating robotics and peripheral equipment, troubleshooting robotic systems, and programming and operating programmable logic controllers (PLCs), automated machinery, and conveyors. Additionally, they perform testing and evaluation on robotics systems, assemble components, and utilize various tools safely and proficiently.

Robotics technicians are essential in evaluating the efficiency and reliability of industrial robotic systems, conducting performance tests, documenting procedures and results, and developing robotic path motions. Robotics technicians are professionals who find employment opportunities in a wide range of industries and sectors. They are in demand in manufacturing facilities, automotive plants, aerospace companies, the defence industry, the medical industry, and various other industrial settings where automation and robotics are integral to operations. Their skills are invaluable in ensuring automated systems' smooth and efficient functioning.

To be successful in their role, robotics technicians need a combination of technical, personal, and professional skills. Effective communication is crucial, as they often collaborate with engineers and other team members on different projects. Problem-solving skills are essential for diagnosing issues and implementing solutions efficiently. Attention to detail is vital to ensure precision in their work as they may encounter diverse robotic systems and equipment configurations. Robotics technicians have excellent problem-solving abilities, communication skills, and a commitment to safety, making them vital contributors to robotics and industrial automation.

ALSO KNOWN AS:

- Electro-Mechanic or Electro-Mechanical Technician
- Engineering Technician
- Automation Technician
- Programmable Logic Controllers Technician
- Robotics Servicing Technician
- Robotics Systems Installer and Repairer

NATIONAL OCCUPATIONAL CLASSIFICATION:

- 22301 – Mechanical engineering technologists and technicians

EDUCATION AND EXPERIENCE

- Post-secondary education is required in an engineering technology program focusing on robotics, automation, mechatronics, or related fields. These programs blend theoretical studies and practical labs on electronic systems, computer programming, robotic control systems, and machine learning, laying the groundwork for understanding robotics technology.
- Robotics technicians often undergo supervised work experience before professional certification. This experience is essential for applying academic knowledge to practical scenarios and gaining experience operating, troubleshooting, and maintaining robotic systems under expert supervision. Work experience is typically acquired through internships, co-op placements, or entry-level jobs in relevant industries.
- Hands-on experience in mechatronics or automation programming is highly valued. This experience showcases the ability to work with systems that integrate mechanical, electronic, and computer engineering for automated solutions. Proficiency in programming languages or specialized robotic software is crucial for developing and refining robotic systems.
- While requirements vary by location, robotics technicians can pursue certification through professional associations or technical institutions. Certification processes usually involve an exam to assess robotics knowledge and skills, considering educational background and work experience. Obtaining certification can boost professional credibility and opportunities.
- The robotics field is characterized by rapid technological progress and the continual introduction of new applications. To remain up-to-date, ongoing education is essential, which may include professional development courses, workshops, seminars, and active participation in the robotics community via associations and forums.

TECHNICAL



Programmable Logic Controllers

Installs, programs, and/or repairs Programmable Logic Controllers (PLCs) to optimize machinery and process controls and ensure the efficient functioning and automation of robotic systems.

- Sets up, programs, and fixes programmable controllers, robot controllers, end-of-arm tools, and conveyors, guaranteeing industrial and robotic systems' correct operation, automation, and efficiency.
- Makes alterations or adjustments to computer-controlled robotic movements to optimize the robot's operation, functionality, or task execution according to specific requirements.
- Connects PLCs to ensure they can communicate with each other and function properly as per company requirements.

Robotics Systems Maintenance

Applies appropriate processes and procedures to maintain robotic systems and components, ensuring systems meet quality assurance and operating specifications.

- To maintain optimal functionality, perform repairs or replacements on robotic and peripheral equipment, including faulty circuit boards, sensors, controllers, encoders, or servomotors.

- Repairs electronic equipment to restore functionality and reliability, ensuring it operates as intended.
 - Maintains service records of robotic equipment and automated systems, facilitating efficient tracking, analysis, and decision-making.
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Equipment Maintenance

Performs routine and non-routine maintenance of equipment to maintain safe and efficient operations.

- Performs corrective maintenance according to established protocols to ensure equipment and systems function efficiently.
 - Resets equipment following repair or service to test equipment to ensure equipment functions as expected.
 - Monitors technical aspects, plans calibration, and repairs robotics equipment to ensure safety, security, and efficiency.
 - Evaluates equipment performance to identify and prevent defects, ensuring operations are safe and efficient.
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Troubleshooting

Identifies operating problems and inefficiencies in current equipment, processes, or systems and reports issues to determine effective solutions.

- Recommends potential updates and short-and long-term infrastructure and equipment requirements.
 - Responds to troubleshooting requests to provide initial diagnostics of robotics and control systems to determine the root cause of errors.
 - Diagnoses and fixes issues in robotic systems by applying expertise in microprocessors, programmable controllers, electronics, circuit analysis, mechanics, sensor or feedback systems, hydraulics, and pneumatics to guarantee correct operation and reduce downtime.
 - Works with other team members to develop contingency strategies to react to faults to minimize disruptions and risk effectively.
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Testing and Evaluation

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

- Assesses and improves the efficiency and reliability of industrial robotic systems by reprogramming them to maximize output and quality.
- Trains robots to execute tasks, ranging from simple to complex, by employing artificial intelligence software or interactive training methods, including designing and conducting iterative tests on samples.
- Tests the performance of robotic assemblies using instruments such as oscilloscopes, electronic voltmeters, or bridges to ensure the desired performance criteria are met.
- Tests the performance of electrical, electronic, mechanical, or integrated systems or equipment to improve the reliability and dependability of robotic systems.

Documentation Management or Reporting

Gathers data from multiple sources to create detailed documentation, facilitating efficient reporting, operations, and knowledge sharing.

- Records robotics test methods and outcomes for streamlined reporting.
- Recorded performance and functionality of robotic systems and documented design or operational test results to ensure quality standards.
- Prepares procedural documents related to robotic systems to enhance overall operational efficiency.
- Prepares documentation for existing and upcoming products to describe functionality and composition and communicate technical specifications in plain language to a broad audience.



Communication

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

- Interprets and presents data results to stakeholders and senior management to facilitate decision-making.
 - Asks questions when assigned unfamiliar tasks to ensure understanding and accuracy.
 - Uses non-technical language to communicate effectively with team members of all experience levels.
 - Informs team members and supervisors of developments affecting consistencies and functionalities to ensure safe and efficient systems.
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Collaboration

Engages in professional collaborative efforts with other team members, 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 that 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 completing a task or goal.
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Attention to Detail

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

- Provides accurate, consistent information on all pieces of work to ensure reliable results.
 - Ensures information and work output is double-checked for precision, maintaining accuracy and consistency.
 - Fills out documents and logs accurately to support safe and efficient operations.
 - Identifies and rectifies mistakes or oversights when possible, enhancing efficiency and safety.
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Problem-Solving

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

- Analyzes data to evaluate operations and understand trends and potential areas of concern to take appropriate action where required.

- Evaluate time commitments and resource constraints to balance overlapping projects to ensure adequate time management.
- Seeks advice from senior decision-makers or subject matter experts when confronted with issues to ensure effective solutions.
- Considers all pieces of information when attempting to solve problems to produce a cognisant and comprehensive solution.



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.

- Participates in safe workplace training as required to ensure an up-to-date understanding of
- Adheres to appropriate health and safety procedures in all aspects of work to ensure zero incidents.
- Reports incidents or problems to proper authorities to ensure all risks are accounted for and corrected.
- Executes all tasks within the framework of the company's established safety management system.

Regulatory Compliance

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

- Complies with specific industry regulations within a defined jurisdiction to maintain a safe work Environment.
- Identifies and evaluates all system requirements to meet applicable codes, standards, and regulations.
- Applies engineering codes and statutes of a defined jurisdiction in the design process to ensure a safe workplace.
- Performs all tasks in compliance with applicable environmental, health, and safety laws and policies.

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