

COMPETENCY PROFILE:

ELECTRICAL ENGINEERING TECHNICIAN

ROLE OVERVIEW

Electrical engineering technicians support engineers engaged in designing and developing electrical systems and equipment. They work in various industries, including engineering services, electrical component manufacturing, the utility sector, and government. While the specifics of their roles may vary depending on the industry, the size of their employer, and their level of seniority, their core responsibilities will remain consistent. These core responsibilities include troubleshooting electrical systems, operating specialized equipment, performing regular equipment maintenance, and providing technical assistance in engineering design processes.

To be successful in their role, electrical engineering 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. The ability to solve problems is vital for quickly identifying issues and applying practical solutions. Attention to detail is critical to ensure precision in their work. Teamwork is also valuable, as they may encounter complex electrical systems and equipment configurations.

Electrical engineering technicians have a combination of technical expertise, problem-solving abilities, communication skills, and a commitment to safety, making them vital contributors to the field of electrical engineering.

ALSO KNOWN AS:

- Electrical/Electronic Technician
- Electrical Technician
- Electronics Manufacturing Technician

NATIONAL OCCUPATIONAL CLASSIFICATION:

- 22310 – Electrical and electronics engineering technologists and technicians

EDUCATION AND EXPERIENCE

- Completing a two—or three-year electrical or electronics engineering technology program, which typically provides foundational knowledge, is generally necessary.
- Some roles may require certification from provincial associations of engineering/applied science technologists and technicians in electrical or electronics engineering technology or a similar field, acknowledging the technician's expertise and qualifications.
- Practical skills are essential for excelling in the field and are developed through education and work experience.
- Before certification, about two years of supervised work experience are usually required. This experience allows technicians to apply theoretical knowledge in real-world scenarios, develop hands-on skills, and tackle practical challenges in the field.

TECHNICAL



Troubleshooting

Identifies and reports on problems and inefficiencies in current equipment, processes, and/or systems to aid in developing and/or implementing solutions.

- Troubleshoots new or existing product issues involving designs, materials, or processes for efficient solutions.
- Design, install, or troubleshoot manufacturing equipment for equipment reliability and maintenance.
- Completes service records and repair documentation to facilitate preventive maintenance and equipment replacement follow-up.
- Identifies and analyzes manufacturing process issues to develop effective troubleshooting strategies to minimize downtime and improve efficiency.

Equipment Operation

Operates equipment using established processes to ensure outcomes are within allowable variances and maximizes safety and efficiency.

- Collaborate with cross-functional teams to ensure the safe operation of rotating electrical machines in various environments.
- Uses equipment such as voltage or current meters to measure and display voltage and test the presence of voltage in circuits for day-to-day assessments and operations.
- Follows appropriate procedures to calibrate and recalibrate instruments and equipment to ensure accurate measurements and quality control.

Equipment Maintenance

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

- Uses a range of specialized tools and equipment to diagnose faults and carry out testing for the maintenance of electrical equipment.
- Performs routine and non-routine maintenance of equipment to maintain safe and efficient operations.
- Performs preventative maintenance according to established protocols to ensure equipment and systems function efficiently.
- Before failure, identify and report significant equipment maintenance needs to maintenance personnel to ensure safe and efficient operations.
- Recommends potential updates and short-and long-term infrastructure and equipment requirements.
- Monitors technical aspects plans testing and calibration, and repairs electrical equipment and systems to ensure safety, security, and efficiency.

Electrical Systems

Contribute to the design, assembly, and commissioning of electrical circuits, equipment, and systems to fulfill the project requirements and ensure operational functionality

- Documents the testing, modification, and implementation of electrical systems.
- Collaborates with other technical staff to analyze electric motors to measure given output requirements.
- Interprets engine electrical systems drawings, specifications, standards, and technical literature to contribute to the design of electrical systems.

Quality Assurance and Quality Control

Follows appropriate processes directed by engineering standards and industry best practices to ensure quality is maintained throughout operations.

- Assesses quality control and calibration data to determine whether operations meet required standards.
- Applies statistical techniques and calculations to monitor and track the acceptability of quality control results.
- Complies with quality assurance policies to ensure regulatory compliance.
- Tests a wide range of electrical and electronic equipment to find and establish routine maintenance schedules for safety and security.

Engineering Design

Responsible for the technical aspects of the planning and design of engineering project[s] to ensure the project is constructed safely, efficiently, and effectively.

- Proposes technical design or process changes to improve the efficiency, quality, or performance of structures, systems, or facilities.

- Use and produce graphics, such as single-line drawings, schematics, and assembly drawings, to convey technical data about a project or task.
 - Assists in interpreting, preparing, and modifying electrical specifications and project-related documents to ensure the project is delivered efficiently.
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Engineering Review and Analysis

Reviews and analyzes relevant technical design and complex system information to develop appropriate solutions.

- Apply their knowledge of electromechanical systems to analyze electric motors, generators, and transformers that will measure given output requirements.
- Assists in inspecting and evaluating electrical, electromechanical, and electronic components to ensure conformance with product specifications and tolerance.
- Defines the engineering-related problem or opportunity and potential risks and benefits of project proposal[s] to senior management and stakeholders so that the project proposal can be approved and implemented.
- Recommends appropriate technical design or process changes to improve efficiency, quality, or performance.
- Evaluate the precision and accuracy of equipment, facilities, structures, and systems to formulate a corrective action plan.



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.

- Actively listens to team members to address concerns and integrate ideas, values, and new information where appropriate.
- Interprets and presents data results to stakeholders and senior management to facilitate decision-making.
- Ask questions when assigned unfamiliar tasks to ensure understanding and accuracy.
- Uses non-technical language to communicate effectively with team members of all experience levels.
- Adapt communications depending on the environment, coworkers, or tasks to ensure all parties know their responsibilities.

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.
- Provides information on a timely basis and delivered in an audience-appropriate language to communicate effectively.
- Monitors the quality of work done by team members by establishing procedures to ensure information is reviewed.
- Accurately completes documents and report logs to ensure safe and efficient operations.

Problem-Solving

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

- Analyzes project metrics to understand trends and potential areas of concern to take appropriate actions where required.
- Simplifies complex ideas and technical concepts into accessible information to communicate with stakeholders, senior management, and team members.
- Identifies, evaluates, and generates solutions to concerns brought forth by team members to maintain a harmonious workflow.
- Seeks advice from senior decision-makers or subject matter experts when confronted with issues to ensure effective solutions.

Teamwork

Actively participates in working with and helping others to accomplish a common objective.

- Verbally conveys complex technical information accurately, clearly, and effectively to communicate technical operations.
- Presents information to decision-makers in a logical and structured manner to ensure understanding.
- Recommends improvements or solutions to supervisors to improve operational efficiency.
- Supports the decisions of senior employees and works to achieve the specified outcome.
- Participates in training activities and incorporates acquired skills and knowledge to improve operational performance.



Health and Safety Procedures

Abides by 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.

- Conducts safety inspections of shop environments to detect and correct hazardous conditions.
- Participates in safe workplace training to ensure an up-to-date understanding of health and safety best practices.
- Demonstrates knowledge of the safeguards to protect the public and the methods of mitigating adverse impacts.
- Interprets and applies safety codes, policies and practices, and accident-prevention procedures.

Regulatory Compliance

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

- Applies regulatory and licensing requirements when completing installations, maintaining, and repairing electrical equipment.
- Compliance with regulatory requirements to prevent using banned materials during operations for the safety of individuals and the environment.
- Complies with specific industry regulations within a defined jurisdiction to maintain a safe work environment.
- Notifies necessary parties of containment or quality issues to ensure appropriate measures are taken according to organizational, legal, and regulatory requirements.

This profile is a living document. If you have any feedback or would like to help us improve the profile, please reach out to research@eco.ca.