



New Brunswick Indigenous Career College

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*"Your Training – Your Future,
Soar to New Heights"*

Refrigeration and Air Conditioning Pre-Employment Program

Introduction

GTA's program hold accreditation from the New Brunswick Apprenticeship and Occupational Certification Board, allowing our graduates to sit for the 1st block exam right after graduation that covers vital sessions on safety, tools and equipment, access equipment, hoisting, lifting, rigging, refrigeration fundamentals, refrigerants, gases, oils, compressors, valves, piping, tubing, soldering, brazing, leak testing, evacuation, charging, electrical fundamentals, motors, trade documentation, installation, maintenance, control fundamentals, communications, and workplace mentoring. These sessions are designed to equip participants with the essential skills and knowledge required for success in the HVAC field.

Admissions Prerequisites

- At least grade 12 or
- Mature student (21+) non-graduate or
- Exceptions might be made for the right applicant.

Program Courses

RACM-100 - Safety

The Safety course is critically important for HVAC technicians as it equips them with the knowledge and skills necessary to ensure their safety and the safety of others while working in potentially hazardous environments. HVAC technicians often encounter various workplace hazards, such as high voltage, toxic substances, confined spaces, and potentially dangerous equipment. This course empowers them to identify and mitigate these risks effectively, providing a thorough understanding of Personal Protective Equipment (PPE), safety equipment, and regulatory compliance.

By mastering lock-out procedures, hazard assessments, and safe handling of materials, HVAC technicians can significantly reduce the likelihood of accidents and injuries, ensuring that they can perform their essential tasks with confidence and security in the HVAC industry.

RACM-105 - Tools and Equipment

This Tools and Equipment course is of paramount importance for HVAC technicians, providing them with comprehensive knowledge and skills to excel in their profession. HVAC technicians rely heavily on various tools and equipment to diagnose, repair, and maintain heating, ventilation, and air conditioning systems. Throughout the course, participants will not only gain a deep understanding of hand tools, portable and stationary power tools, and diagnostic and measuring tools but also learn their applications, maintenance, and proper procedures for use.

By mastering this course, HVAC technicians will be well-equipped to utilize a wide range of tools effectively and safely, thereby enhancing their productivity and the quality of their work. They will learn to identify and mitigate hazards associated with these tools and develop safe work practices. Furthermore, the course will introduce students to the use of digital technology and electronic devices in diagnosing equipment and components, keeping them up to date with the latest technological advancements in the HVAC industry. Overall, this course is an essential foundation for HVAC technicians, ensuring they have the skills and knowledge necessary to excel in their field and deliver top-notch service to their clients.

RACM-110 - Access Equipment

The Access Equipment course is a vital component of the HVAC technicians' training, as it equips them with essential knowledge and skills related to accessing equipment in their field. HVAC technicians frequently encounter situations that require them to work at heights or access hard-to-reach areas for installations, maintenance, or repairs. This course is instrumental in helping them understand the various types of access equipment, including ladders, scaffolding, lifts, and staging, and how to use them safely and efficiently.

Additionally, students will gain insights into interpreting codes, regulations, and information related to access equipment, ensuring compliance with industry standards. They will learn to identify hazards associated with the use of access equipment and develop safe work practices. Furthermore, understanding factors such as safety, load characteristics, environmental considerations, and application specifics when selecting access equipment is crucial for HVAC technicians to execute their tasks safely and effectively. Ultimately, this course prepares HVAC technicians to navigate complex job sites and access equipment confidently, ensuring both their safety and the quality of their work.

RACM-115 - Hoisting, Lifting, and Rigging

The Hoisting, Lifting, and Rigging course holds significant importance for HVAC technicians, providing them with the knowledge and skills required to handle rigging, hoisting, and lifting equipment safely and effectively in their profession. In the HVAC industry, technicians frequently encounter situations that involve moving heavy equipment, materials, or

components to install or maintain heating, ventilation, and air conditioning systems. This course equips them with the expertise needed to understand various types of equipment, including slings, come-alongs, shackles, hoists, belts, ropes, cables, and more. Participants will not only learn how to select the appropriate equipment based on safety, load characteristics, environmental factors, and application specifics but also how to rig and secure loads efficiently and safely.

Moreover, students will gain insights into interpreting codes and regulations related to rigging, hoisting, lifting, and access equipment, ensuring compliance with industry standards. The course also covers essential aspects such as hazard identification, safe work practices, communication methods during hoisting and lifting operations, and equipment maintenance. By completing this course, HVAC technicians are better prepared to handle complex tasks involving heavy equipment, ensuring both their safety and the successful execution of their projects. Overall, this course plays a critical role in enhancing the competence and safety of HVAC technicians in their field of work.

RACM-120 - Refrigeration Fundamentals

The Refrigeration Fundamentals course is an indispensable foundation for HVAC technicians, providing them with the essential knowledge and skills required to excel in their field. Refrigeration is at the heart of heating, ventilation, and air conditioning systems, making it a fundamental aspect of the HVAC technician's work. This course empowers students with a deep understanding of the principles and concepts associated with refrigeration, including temperature scales, heat transfer methods, basic gas laws, and the pressure-temperature relationship.

Moreover, students will become proficient in comprehending the vapor compression cycle, the core of refrigeration systems. They will learn about key components such as compressors, condensers, evaporators, metering devices, and suction lines, and how they operate within the cycle. Understanding superheat and subcooling, as well as their significance in the refrigeration process, will further enhance students' competence in system design and operation. Additionally, the course covers factors affecting system capacity and performance, ensuring HVAC technicians can optimize system efficiency and troubleshoot effectively. In sum, this course equips HVAC technicians with the knowledge needed to excel in their profession, enabling them to design, install, maintain, and repair HVAC systems with confidence and expertise.

RACM-125 - Refrigerants, Gases and Oils

The Refrigerants, Gases, and Oils course are of paramount importance to HVAC technicians, providing them with comprehensive knowledge and skills in handling refrigerants, gases, and oils essential to the heating, ventilation, and air conditioning field. The course covers fundamental concepts such as understanding the characteristics, applications, and safety

classifications of refrigerants, as well as the impact of these substances on the environment. Students will also delve into recovery and recycling methods, equipment, and procedures, ensuring compliance with regulatory requirements and environmental protection measures.

Moreover, the course educates students on the different types of refrigerants, their properties, and applications, while also emphasizing the importance of proper refrigerant handling, storage, and transportation. Furthermore, students will explore various types of refrigerant oils, lubricants, and gases used in HVAC systems, gaining insight into their characteristics and appropriate applications. Comprehending Canada's Ozone Layer Protection Awareness Training Program and certification requirements for handling refrigerants, as well as the Environmental Code of Practice for the Elimination of Fluorocarbon Emissions, is integral to ensuring that HVAC technicians can safely and responsibly work with these substances. In conclusion, this course equips HVAC technicians with the knowledge and skills necessary to navigate the complex world of refrigerants, gases, and oils, ensuring both safety and environmental stewardship in their work.

RACM-130 - Compressors I

The Compressors I course plays a pivotal role in the training of HVAC technicians, equipping them with indispensable knowledge and skills to excel in their field. Compressors are the heart of refrigeration systems, and understanding their components, operation, and principles is fundamental for HVAC technicians. This course covers a wide range of topics, starting with the definition of key terminology associated with compressors and emphasizing safe work practices and hazard identification.

Moreover, students will delve into the core principles of compressors, gaining an in-depth understanding of their purpose and operation within refrigeration systems. They will explore various types of compressors, including reciprocating, scroll, rotary, screw, centrifugal, and linear, and learn about their unique characteristics and applications. The course also focuses on compressor components, efficiency, lubrication methods, and cooling techniques. Additionally, students will be prepared to identify and address common compressor failures, both mechanical and electrical, ensuring they can troubleshoot and maintain HVAC systems effectively. Overall, the Compressors I course empowers HVAC technicians with the knowledge and skills necessary to work confidently with compressors, a critical component of HVAC/R systems, enhancing their competence in the field.

RACM-135 - Valves and Accessory Devices

The Valves and Accessory Devices course is a fundamental aspect of HVAC technician training, offering crucial insights into the world of refrigeration systems. Understanding valves and accessory devices is essential for HVAC technicians, as these components play a critical role in regulating and controlling HVAC/R systems. This course encompasses a wide range of topics,

starting with the definition of key terminology associated with valves and accessory devices and the importance of identifying hazards and practicing safe work procedures.

Furthermore, students will learn how to interpret codes and regulations related to these components, ensuring compliance with industry standards. They will gain a deep understanding of the purpose and operation of valves, including safety, metering, service/access, flow controls, and water regulating valves. The course also covers accessory devices such as regulators, filters, driers, indicators, accumulators, separators, receivers, relief devices, and heat exchangers, providing comprehensive knowledge of their characteristics and applications. By the end of this course, HVAC technicians will be well-prepared to recognize and address common valve and accessory device failures, enhancing their competence in system maintenance and ensuring efficient and safe HVAC/R operations. Overall, this course equips HVAC technicians with the knowledge and skills necessary to excel in their field, making it an essential part of their training.

RACM-140 - Piping, Tubing, Soldering and Brazing

The Piping, Tubing, Soldering, and Brazing course is a cornerstone of HVAC technician training, providing essential knowledge and skills necessary to excel in the field of heating, ventilation, and air conditioning. HVAC technicians routinely work with piping and tubing systems, and this course equips them with comprehensive understanding and expertise in this area. Students will learn terminology, hazard identification, and safe work practices related to piping, tubing, soldering, and brazing.

Moreover, this course covers codes and regulations, specialized tools and equipment, and materials used in piping practices. Students will gain insights into various types of refrigeration piping, tubing, fittings, pipe materials, and accessories. They will also explore soldering and brazing techniques, insulation, sealants, adhesives, and fasteners, all of which are essential components of HVAC systems. With practical objectives such as cutting, bending, flaring, soldering, and brazing tubing, as well as connecting and fastening tubing and fittings, students will acquire hands-on skills necessary for real-world applications. This course empowers HVAC technicians to fabricate brackets and supports and install piping systems confidently, ensuring that HVAC/R systems function efficiently and safely. Overall, it is a crucial part of their training that prepares them to excel in their profession.

RACM-145 - Leak Testing, Evacuation and Charging

The Leak Testing, Evacuation, and Charging course is of paramount importance to HVAC technicians as it equips them with essential skills for maintaining, repairing, and optimizing refrigeration and air conditioning systems. Throughout this course, students will acquire knowledge of terminology, safe work practices, and regulatory compliance related to pressure and leak testing, evacuation, and charging of HVAC/R systems. They will learn to identify and effectively use a range of specialized tools and equipment required for these crucial tasks.

Furthermore, students will gain proficiency in calculating the volume of gases and liquids needed for system pressure tests, a skill vital for system integrity. They will develop expertise in conducting pressure and leak tests, ensuring systems are free of leaks and capable of optimal performance. The course also covers the procedures for evacuating and dehydrating systems, a critical step in maintaining system efficiency and preventing moisture-related issues. Additionally, students will learn how to charge systems with refrigerants and oil, using various methods to verify the system charge for accurate performance. With practical objectives including performing pressure and leak tests, as well as hands-on instruction in evacuation and charging procedures, this course empowers HVAC technicians with the skills and knowledge necessary to excel in their profession, ensuring that HVAC/R systems operate efficiently and reliably.

RACM-150 - Electrical Fundamentals

The Electrical Fundamentals course is of paramount importance to HVAC technicians as it provides them with a solid foundation in the essential principles of electricity, ensuring their competence in handling electrical systems within heating, ventilation, air conditioning, and refrigeration equipment. Throughout this course, students will gain knowledge of fundamental electrical concepts, including the flow of current, voltage, resistance, and power in both AC and DC circuits. They will develop expertise in interpreting electrical symbols, wiring diagrams, and the selection of electrical components such as conductors, relays, switches, contactors, overloads, and transformers.

Moreover, students will learn about electronic controls and sensors, vital for the precise regulation of HVAC/R systems. This course equips students with the skills to identify and troubleshoot electrical issues, including overloaded, grounded, open, and short circuits, using schematic wiring diagrams. Practical objectives include hands-on experience in measuring voltage, current, resistance, and power, enabling students to confidently diagnose and rectify electrical problems in HVAC/R equipment. With safety at its core, this course ensures that HVAC technicians are well-prepared to work with electricity safely and effectively, a skill set crucial for their success in the field.

RACM-155 - Motors I

The Motors I course is an indispensable component of an HVAC technician's training, providing comprehensive knowledge of motors, their components, operation, and motor controls. Understanding these critical elements is essential for HVAC technicians as they work extensively with various types of motors within heating, ventilation, air conditioning, and refrigeration systems. This course emphasizes the importance of safety in handling motors and motor controls while equipping students with the ability to interpret motor nameplates and understand the principles governing single-phase motor operation.

Students will learn to identify different types of motors, such as single-phase, three-phase, dual voltage, multi-speed, electrically commutated motors (ECM), and variable frequency drives (VFD). Additionally, they will gain expertise in motor starting devices, capacitors, and motor overload protection devices. Practical objectives include hands-on experience in testing motor winding resistance and capacitors, ensuring that students are well-prepared to diagnose, repair, and maintain motors effectively. This course's knowledge and skills are invaluable for HVAC technicians, enabling them to excel in troubleshooting, maintenance, and installation tasks involving motors and motor controls in HVAC/R equipment.

RACM-160 - Trade Documentation

The Trade Documentation course equips HVAC technicians with essential knowledge and skills related to trade-specific documentation and reference materials, emphasizing their significance and practical use in the HVAC industry. This course is of paramount importance to HVAC technicians as it enables them to navigate and understand various forms of documentation commonly encountered in their field, including manufacturers' specifications, drawings, codes, standards, service manuals, warranties, and many others.

Students will learn how to access, interpret, and apply information from these documents effectively, ensuring accurate and efficient work in HVAC installation, maintenance, and repair tasks. Additionally, the course covers the procedures for completing trade-related documentation such as repair orders, purchase orders, maintenance sheets, and service records, ensuring that technicians are well-prepared to maintain thorough and accurate records of their work. Proficiency in trade documentation is vital for HVAC technicians, enabling them to provide high-quality service, adhere to industry standards, and maintain detailed records of their projects, which is crucial for compliance, safety, and accountability.

RACM-165 - Basic Refrigeration and Air Conditioning Installation

The Basic Refrigeration and Air Conditioning Installation course is an indispensable foundation for HVAC technicians, providing them with essential knowledge and skills for successful system installations. This course is paramount for HVAC technicians as it encompasses the complete installation process of refrigeration and air conditioning systems, from initial preparation to system start-up. Students will learn the terminology, codes, and regulations pertinent to HVAC/R installations, while focusing on safety and adherence to industry standards.

The course covers a wide array of critical topics, including specialized tools and equipment, types of systems, energy sources, component selection, and system installation procedures. With a strong emphasis on practical skills, students will gain hands-on experience in piping and tubing installation, wiring, pressure and leak testing, evacuation, and charging. Understanding documentation requirements for installation and system start-up is also integral to ensure thorough, well-documented work, which is crucial for both compliance and future maintenance. This course equips HVAC technicians with the essential skills and knowledge needed to perform

efficient, safe, and effective installations, which are fundamental to their role in the HVAC industry.

RACM-170 - Basic System Maintenance

The Basic System Maintenance course is of utmost importance to HVAC technicians as it equips them with the knowledge and skills necessary to ensure the optimal performance and longevity of refrigeration and air conditioning systems. This course focuses on the fundamentals of performing basic maintenance tasks and inspections, providing students with the essential tools and techniques to keep HVAC/R systems in excellent working condition. By learning how to identify potential issues affecting system efficiency and safety, such as worn components, dirty coils, and defective parts, technicians can prevent costly breakdowns and ensure energy-efficient operation.

Furthermore, this course delves into predictive and scheduled maintenance procedures, enabling technicians to proactively address system defects before they lead to major failures. With an emphasis on safety and adherence to industry standards, students gain the necessary expertise to inspect, troubleshoot, and perform routine maintenance tasks efficiently. The knowledge acquired in this course is instrumental in the daily responsibilities of HVAC technicians, allowing them to provide reliable and effective service, maintain client satisfaction, and contribute to the overall efficiency and sustainability of HVAC/R systems.

RACM-175 - Control Fundamentals

The Control Fundamentals course plays a pivotal role in shaping the skill set of HVAC technicians, making it a crucial component of their training. In this course, students acquire essential knowledge of control systems and gain expertise in understanding their components and operations. Control systems are the backbone of modern HVAC/R technology, allowing technicians to regulate and optimize the performance of heating, ventilation, air conditioning, and refrigeration systems. By mastering control fundamentals, students learn how to efficiently manage system components, such as relays, switches, and actuators, to maintain precise temperature, humidity, pressure, and flow control.

Understanding the distinctions between open and closed loop control and various control system types, including electromechanical, electronic, pneumatic, and direct digital control (DDC), empowers technicians to troubleshoot, diagnose, and resolve control-related issues effectively. With this knowledge, HVAC technicians are better equipped to select, place, connect, and maintain control system components, contributing to the overall efficiency, reliability, and safety of HVAC/R systems. Control Fundamentals is a cornerstone course for HVAC professionals, enabling them to excel in the dynamic field of heating, ventilation, air conditioning, and refrigeration, and provide top-tier service to their clients and employers.

RACM-180 - Communications

The Communications course is a foundational element of an HVAC technician's training, emphasizing the critical importance of effective communication practices. In the dynamic field of heating, ventilation, air conditioning, and refrigeration, technicians must be adept at communicating with various stakeholders, including customers, supervisors, apprentices, colleagues, authorities having jurisdiction, suppliers, and manufacturers. This course equips students with the knowledge and skills necessary for successful workplace communication, both verbally and through electronic means.

In today's digital age, the ability to use electronic communication devices, such as computers and mobile phones, is essential for sharing information, accessing resources, and staying connected. The course emphasizes the responsible and effective use of these devices to enhance productivity and efficiency. Moreover, students learn about different communication and learning styles, including visual, auditory, reading/writing, and kinesthetic, to tailor their interactions to the preferences of those they communicate with.

Beyond technical skills, the Communications course emphasizes the importance of personal attributes like safety consciousness, time management, punctuality, and respect for diversity in the workplace. Students also gain an understanding of what constitutes harassment and discrimination, promoting a respectful and inclusive work environment. Effective communication is the linchpin of a successful HVAC career, facilitating teamwork, problem-solving, and customer satisfaction. This course ensures that HVAC technicians are well-prepared to excel in their profession by honing their communication skills and fostering a positive and professional work ethic.

RACM-185 - Workplace Mentoring I

The Workplace Mentoring I course plays a pivotal role in shaping HVAC technicians' career development by focusing on strategies to facilitate skill acquisition within the workplace. In the dynamic field of heating, ventilation, air conditioning, and refrigeration, continuous learning and skill development are essential for staying competitive and excelling in one's career. This course equips students with the knowledge and tools necessary to effectively enhance their skills and knowledge while on the job.

Throughout this course, students gain insights into the significance of their own experiences and how they contribute to their professional growth. They also explore the critical role of workplace mentors and the shared responsibilities between apprentices and mentors in the learning process. Understanding one's own learning preferences and relating them to acquiring new skills is a key aspect of this course, helping individuals tailor their approach to skill development.

Furthermore, students delve into the importance of various types of skills in the HVAC trade and the essential skills that underpin success in the field. They learn about different learning

methods and preferences, allowing them to select the most effective strategies to meet their learning goals. Effective communication techniques are also emphasized, as clear and open communication is crucial for both learning and teaching.

In conclusion, Workplace Mentoring I lays the foundation for HVAC technicians to become lifelong learners and skillful professionals in their trade. By mastering the strategies and principles taught in this course, students are well-prepared to excel in their apprenticeships and continually advance their skills throughout their HVAC careers.