



Heating, Ventilation, Air Conditioning & Refrigeration (HVAC/R)-Certificate (2022-2023 Catalog)

SEMESTER-BY-SEMESTER PROGRAM MAP FOR FULL-TIME STUDENTS

Courses are listed in preferred order of completion

Plans can be modified to fit student needs by adding more semesters

Choose your courses with your Advisor.

Developmental Education Courses (if required)		<input type="checkbox"/>	MATH020	Pre-Algebra	
<input type="checkbox"/>	ACLS050	Introduction to Academic Literacy	<input type="checkbox"/>	MATH022	Elementary Algebra
<input type="checkbox"/>	ENGL027	Writing Skills Workshop	<input type="checkbox"/>	MATH026	Intermediate Algebra

complete	Course #	Course Title	Credits	Gen Ed	Pre-requisites / Co-requisites	
Semester 1	<input type="checkbox"/>	COLS101	College Success	1		
	<input type="checkbox"/>	CISC101	Introduction to Information Technology	3	QL	
	<input type="checkbox"/>	ELTC101	Electrical Fundamentals	3		
	<input type="checkbox"/>	EMEC114	Mechanical Skills for the Trades	2		
	<input type="checkbox"/>	HVAC101	Fundamentals of HVAC/R I*	4		PRE or CO: ELTC101 or instructor permission
	<input type="checkbox"/>	OSAH101* or OSAH102	Construction Industry Outreach Safety Education* or General Industry Outreach Safety Education	1		
	<input type="checkbox"/>	MATH103	Technical Mathematics	3	QL	
		Total Semester Credits:	17			
Semester 2	<input type="checkbox"/>	CMGT104	Construction Print Reading	3		
	<input type="checkbox"/>	ELTC107	Electrical Wiring I	3		PRE: ELTC101
	<input type="checkbox"/>	ENGL101	English I	3	Comm	PRE: ENGL Placement Policy
	<input type="checkbox"/>	HVAC102	Fundamentals of HVAC/R II	3		PRE: ELTC101, HVAC101
	<input type="checkbox"/>	HVAC124	Heating, Gas, Oil, Solar, Thermal, Air & Hydronic Systems	4		PRE: ELTC101
	<input type="checkbox"/>	HVAC140	Heat Pump Systems	2		PRE: ELTC101, HVAC101
		Total Semester Credits:	18			
Semester 3/4	<input type="checkbox"/>	ELTC135	Electrical Motors and controls	4		PRE: ELTC101
	<input type="checkbox"/>	HVAC204	Refrigeration System Design and Troubleshooting	3		PRE: HVAC102
	<input type="checkbox"/>	HVAC250	Air Distribution Systems: Design, Installation, and Testing	3		PRE: ELTC101, HVAC101
	<input type="checkbox"/>		Technical Electives+++	6-8		
		Total Semester Credits:	16-18			
		Total Degree Credits	51-53			

Notes:

* HVAC101: In conjunction with this course the seminar/testing session: EPA Refrigerant Usage Certification is offered.

**OSAH 101 is the recommended selection.

+Schedules vary by semester start, course offerings, and possible student transition to part-time status.

++Technical Electives: any CADM, EMEC, ELEC, ELTC, ENGG, CHEM, CISC, OR WELD. *Ineligible electives:* CADM100, CADM117, EMEC115, ENGG100, or ENGG117.

***It is the student's responsibility to be knowledgeable of NCC graduation requirements and to verify transfer requirements with the 4-year institution. Courses listed on the program map are based upon the assumption that prerequisites and courses taken in previous semesters will be successfully completed**

Program Narrative:

- As a graduate of Northampton's HVAC/R certificate program, you will have the qualifications needed to find good-paying employment in this highly technical field. Many of our graduates command above-average salaries as service and installation technicians with HVAC/Mechanical contractors or as maintenance technicians in commercial and industrial facilities.
- Our program offers the unique opportunity to learn the concepts and service practices on components and equipment used in HVAC/R systems. You will also learn the proper methods of recovery and handling of refrigerants and be prepared to take the EPA Refrigerant Technician licensure test.
- The program's curriculum includes electrical theory, heating and cooling concepts, refrigeration cycle theory, equipment operation, component specification, whole system operation, system calculations, and diagnostic approaches.
- If you decide to advance your education further, all of the course work in this certificate program can be applied toward Northampton's Associate in Applied Science (AAS) degree: Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Technology.

Program Learning Outcomes:

- Demonstrate an ability to work independently and collaboratively.
- Analyze and present data in an acceptable and standardized manner.
- Demonstrate a basic framework of technical vocabulary applicable to the HVAC/R field.
- Demonstrate the proficient use of the tools and diagnostic equipment utilized within the industry.
- Interpret and apply the EPA regulatory laws applicable to refrigerant handling and other environmentally hazardous materials used with HVAC/R systems.
- Be able to describe the principles of operation of residential, commercial, institutional, and industrial HVAC/R equipment.
- Demonstrate the ability to service and repair these systems utilizing industry proven methods and procedures.
- Be able to explain commercial/industrial control systems and demonstrate the troubleshooting skills necessary to solve complex problems.
- Demonstrate knowledge of airflow dynamics and the proper application of components in a commercial refrigeration system.
- Apply math concepts in solving equipment related problems and service invoicing.
- Demonstrate competent communication and technical writing skills.
- Demonstrate observational, integrative, and synthetic skills.

Career Information: Technician Job titles related to HVAC/R education:

- HVAC/R Service
- Commercial Refrigeration
- Building Automation
- Facilities Maintenance

See <https://northampton.emsicc.com/careers/heating-and-air-conditioning-mechanic-and-installer> for information on career options and earning potential.