



HEATING, VENTILATION, AIR CONDITIONING, & REFRIGERATION (HVAC/R) – Associate in Applied Science (2021-22 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"/>	ACLS050	Introduction to Academic Literacy	<input type="checkbox"/>
<input type="checkbox"/>	ENGL027	Writing Skills Workshop	<input type="checkbox"/>

Location: B= BETH, M= MROE, S=SBTH, E= ESTN, D= DIST *subject to change

complete	Course #	Course Title	Credits	Gen Ed	Fall	Winter	Spring	Summer	Pre-requisites / Co-requisites	
Semester 1	<input type="checkbox"/>	COLS101	College Success	1		B, M, D	----	B, M, D	D	
	<input type="checkbox"/>	CISC101	Introduction to Information Technology	3	CL	B, M, D	D	B, M, D	B, M, D	
	<input type="checkbox"/>	ELTC101	Electrical Fundamentals	3		B	----	B	B	
	<input type="checkbox"/>	EMEC114	Mechanical Skills for the Trades	2		B	----	B	B	
	<input type="checkbox"/>	HVAC101	Fundamentals of HVAC/R I*	4		B	----	B	B	PRE or CO: ELTC101
	<input type="checkbox"/>	MATH103	Technical Mathematics	3	QL	B, D	----	B, M, D	---	
	<input type="checkbox"/>	OSAH101* or OSAH102	Construction Industry Outreach Safety Education* or General Industry Safety Education	1		B	----	B		
		Total Semester Credits:	17							
Semester 2	<input type="checkbox"/>	CMGT104	Construction Print Reading	3		B	----	B	---	
	<input type="checkbox"/>	ELTC107	Electrical Wiring I	3		B	----	B	----	PRE: ELTC101
	<input type="checkbox"/>	ENGL101	English I	3	Comm.	B, M, D, E	----	B, M, D, E	B, M, D	PRE: ENGL placement policy
	<input type="checkbox"/>	HVAC102	Fundamentals of HVAC/R II	3		B	----	B	----	PRE: ELTC101, HVAC101
	<input type="checkbox"/>	HVAC124	Heating: Gas, Oil, Solar, Thermal, Air & Hydronic Systems	4		B	----	B	----	PRE: ELTC101
	<input type="checkbox"/>	HVAC140	Heat Pump Systems	2		B	----	B	----	PRE: ELTC101, HVAC101
		Total Semester Credits:	18							
Semester 3	<input type="checkbox"/>	CMTH102	Introduction to Communication	3	Comm.	B, M, D	----	B, M, D	B, M, D	
	<input type="checkbox"/>	ELTC135	Electrical Motors and Controls	4		B	----	B	----	PRE: ELTC101
	<input type="checkbox"/>	ENGL151T	English II (Technical Writing)	3	Comm.	B	----	B, M	----	PRE: ENGL101
	<input type="checkbox"/>	PHYS152	Physical Science II	3	Science	B, D	----	D	D	
	<input type="checkbox"/>		Technical Elective	3			----			Depends on course selected
		Total Semester Credits:	16							
Semester 4	<input type="checkbox"/>	HVAC204	Refrig. System Design & Troubleshoot	3					----	PRE: HVAC102
	<input type="checkbox"/>	HVAC50	HVAC Air Distribution Systems: Design, Install, Testing	3					----	PRE: ELTC101, HVAC101
	<input type="checkbox"/>		AH,SIT, or SSHB Elective	3	AH,SIT, SSHB	B, M, D	D	B, M, D	B, M, D	Depends on course selected
	<input type="checkbox"/>		AH,SIT, or SSHB Elective	3	AH,SIT, SSHB	B, M, D	D	B, M, D	B, M, D	Depends on course selected
	<input type="checkbox"/>		Elective	3		B, M, D	D	B, M, D	B, M, D	Depends on course selected
		Total Semester Credits:	15							
		Total Degree Credits	66							

General Education Requirements

<input type="checkbox"/>		Diversity (D)
<input type="checkbox"/>		Writing Intensive (G)

Notes: *In conjunction with this course (HVAC101) the non-credit seminar/testing session: ACRNC107 - EPA Refrigerant Usage Certification is scheduled.
 -Technical Electives: any CADM, EMEC, ELEC, ELTC, ENGG, CHEM, CISC, or WELD except CADM100, EMEC115, ENGG100, OR ENGG117.
 -For the General Education Electives, students must select one course from the list of approved courses in two of the following categories: Arts & Humanities (AH); Social Science: Societies and Institutions over Time (SIT); Social Science: Scientific Study of Human Behavior (SSHB); One course should be designated as Diversity (D) and Writing Intensive (G).

*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

Arts & Humanities (AH)
ARTA 100 Art and Visual Thinking
ARTA 101 Art History Survey
CMTH 110 Introduction to the Theatre
CMTH 111 Acting I
CMTH 115 Technical Theatre
CMTH 117 Stagecraft
CMTH 126 The Communication Arts
CMTH 189 Stage Voice and Movement
CMTH 190 Stage Production
CMTH 206 Directing
CMTH 211 Plays: Classical to Contemp. (G-WI)
CMTH 212 Acting II
CMTH 218 Theatre Portfolio
CMTH 220 Introduction to Film
CMTH235 Understanding Culture Through Film
DANC 101 Dance History
DANC 110 Ballet I
DANC 120 Modern Dance I
DANC 130 Jazz I
DANC 210 Ballet II
DANC 220 Modern Dance II
DANC 230 Jazz II
ENGL 201 British Literature I (G-WI)
ENGL 203 Shakespeare (G-WI)
ENGL 205 American Literature I (G-WI)
ENGL 211 Plays: Classical to Contemp. (G-WI)
ENGL 215 Multicultural Adolescent Lit (G-WI)
ENGL 250 Latin American Literature (G-WI)
ENGL 251 British Literature II (G-WI)
ENGL 253 Creative Writing
ENGL 255 American Literature II (G-WI)
ENGL 256 Modern Poetry (G-WI)
ENGL 257 20th Century Lit by Women (G-WI)
ENGL258 Fiction Writing
ENGL 260 Contemporary Literature (G-WI)
ENGL 264 Irish Literature (G-WI)
ENGL 265 African-American Literature (G-WI)
ENGL 267 Poetry Writing
HUMA 121 The American Work Experience (G-WI)
HUMA 140 Intro to Women & Gender Studies (G-WI)
HUMA 150 Nature of the Environment
HUMA210 Creativity and the Origin of Ideas
JOUR 101 Journalism and Society
Modern Language - All MDLA Courses
MUSC 101 Introduction to Music
PHIL 111 On Death and Dying (G-WI)
PHIL 121 World Religions
PHIL 201 Introduction to Philosophy
PHIL 202 Ethics and Moral Problems (G-WI)
PHIL 204 Asian Philosophies
PHIL 211 Ancient Philosophy
PHIL 215 Modern Philosophy
PHIL220 Existentialism
PHIL 225 What is Freedom?

Electives for AAS Degrees
All courses except: OXX-level courses; EARL221, 222

Societies & Institutions Over Time (SIT)
ARCH 155 Architectural History II 1870-Present (AAS ONLY)
CMTH 221 History of Broadcasting
GEOG 101 World Geography
GEOG 151 Geography of the U.S. and Canada (G-WI)
GLBL 130 Intro to Global Studies
GLBL 160 Field Experience & Acad Research in GS
GLBL 230 Global Studies Capstone
HIST 103 Ancient and Medieval History
HIST 113 American History I (G-WI)
HIST 121 The Black Experience (G-WI)
HIST 123 African Civilization
HIST 140 Modern Chinese History
HIST 153 Found of Mod Euro History, 1300-1815 (G-WI)
HIST 163 American History II
HIST 165 The American Experience of Warfare (G-WI)
HIST 166 Civil War and Reconstruction (G-WI)
HIST 168 History of the Middle East (G-WI)
HIST 173 Mod European History, 1815 to Present (G-WI)
HIST 183 Modern American History 1945-Present
HIST 210 History of Mod Science, 1859 to Present
HIST 211 History of Pennsylvania
INTS 201 Implementing Sustainable Energy System...
INTS 202 The Architecture of the City: Classic to Contemp.
POLS 101 Introduction to Political Science
POLS 105 American Constitutional Law (G-WI)
POLS 110 American National Government (G-WI)
POLS 150 Peace Studies & Conflict Resolution (Study Abroad)
POLS 170 Politics of Modern Turkey (Study Abroad)
POLS 202 International Relations
POLS 205 Women and Politics (G-WI)
POLS 251 State and Local Government (G-WI)
SOCA 102 Cultural Anthropology (G-WI)
SOCA 105 American Ethnicity
SOCA 160 Issues in Contemp.Genocide & Mass Violence

Scientific Study of Human Behavior (SSHB)
ECON 201 Macroeconomics
FDST110 Food and Identity
GEOG 121 Environmental Sustainability (G-WI)
GEOG 140 Investigating Climate Change)
GEOG 271 Intro to Geographic Info Systems
HUMA 250 Research Methods in Social Sciences (G-WI)
INTS 250 Study Abroad
PSYC 103 Introduction to Psychology (G-WI)
PSYC 205 Research Methods
PSYC 230 Introduction to Health Psychology
PSYC 235 Dev Child Psychopathology
PSYC 245 Cognitive Psychology
PSYC 255 Abnormal Psychology
PSYC 258 Developmental Psychology (G-WI)
PSYC 265 Psychology of Sex and Gender
SOCA 103 Principles of Sociology (G-WI)
SOCA 125 Sociology of Families (G-WI)
SOCA 210 Sociology of Gender

Diversity (D) Electives
BIOS 126 Environmental Science
BIOS 210 Environmental Biology
BUSA 115 Intro to International Business
CMTH 126 The Communication Arts
CMTH 211 Plays: Classical to Contemporary
CMTH 215 Intercultural Communication
CMTH235 Understanding Culture Through Film
DANC 101 Dance History
ENGL 151L English II (Literature)
ENGL 205 American Literature I
ENGL 211 Plays: Classical to Contemporary
ENGL 215 Multicultural Adolescent Literature
ENGL 250 Latin American Literature
ENGL 251 British Literature II
ENGL 253 Creative Writing
ENGL 255 American Literature II
ENGL 256 Modern Poetry
ENGL 257 20th Century Lit by Women
ENGL 260 Contemporary Literature
ENGL 264 Irish Literature
ENGL 265 African-American Literature
ENGL 267 Poetry Writing
GEOG 101 World Geography
GEOG 121 Environmental Sustainability
GEOG 151 Geography of the U.S. and Canada
GEOG 210 Weather and Climate
GLBL 130 Intro to Global Studies
GLBL 160 Field Experience & Acad Research in GS
GLBL 230 Global Studies Capstone
HIST 113 American History I
HIST 121 The Black Experience
HIST 140 Modern Chinese History
HIST 165 The American Experience of Warfare
HIST 166 Civil War & Reconstruction
HIST 168 History of the Middle East
HIST 173 Mod Euro History: 1815-Present
HIST 183 Modern American History 1945-Present
HUMA 121 American Work Experience
HUMA 140 Intro to Women and Gender Studies
HUMA 150 Nature of the Environment
HUMA210 Creativity and The Origin of Ideas
INTS 201 Implement Sustain Energy Sys in Dev Com
MATH 150 Introductory Statistics
Modern Language - All MDLA Courses
PHIL111 On Death and Dying
PHIL 121 World Religions
PHIL 204 Asian Philosophies
POLS 101 Introduction to Political Science
POLS 105G American Constitutional Law
POLS 150 Peace Studies & Conflict Resolution (Study Abroad)
POLS 270 Politics of Modern Turkey (Study Abroad)
POLS 202 International Relations
POLS205 Women & Politics
POLS 251 State & Local Government
PSYC 230 Introduction to Health Psychology
PSYC 258 Developmental Psychology
SOCA 102 Cultural Anthropology
SOCA103 Principles of Sociology
SOCA 105 American Ethnicity
SOCA 125 Sociology of Families
SOCA 150 Deviance
SOCA160 Issues in Cont Genocide & Mass Violence
SOCA204 Social Problems

Program Narrative:

HVAC/R technology continues to become more and more sophisticated with each technological development. Highly efficient and environmentally sustainable equipment provides affordable and reliable comfort in our factories, offices and homes. These systems create the demand for well-trained technicians who can service, maintain, install and retrofit complex equipment.

Graduates of Northampton's HVAC/R Technology associate's degree program are qualified to service and repair air conditioning equipment, oil and gas burners, heat pumps, ventilation equipment, and commercial refrigeration systems located in residences, offices, industrial plants, medical and educational institutions and retail establishments. Earning an associate's degree gives you an additional competitive edge, particularly if you are interested in growing into supervisory positions. It is also a stepping stone to an advanced degree, such as a bachelor of science.

Program Learning Outcomes:

Demonstrate an ability to work independently & collaboratively.

Demonstrate competent speaking skills when working with diverse groups.

Describe the operation and application of commonly used types of heating, ventilating, air conditioning and refrigeration systems used in residential and commercial facilities.

Demonstrate observational, integrative and synthetic skills.

Demonstrate proficient research and computer skills in data gathering and analysis.

Demonstrate a basic framework of technical vocabulary and graphics interpretation applicable to the area of equipment maintenance and design.

Describe the principles and function of the mechanical, electrical and fluid power components and assemblies used in HVAC/R systems.

Operate, program, troubleshoot, repair and modify equipment and associated components commonly found in air conditioners, heat pumps, gas burners, oil burners and commercial refrigeration systems.

Demonstrate the proper use of common mechanic tools and measuring gages used in HVAC/R construction and troubleshooting.

Apply mathematics to solving equipment related problems.

Analyze and present data in an acceptable and standardized manner.

Demonstrate the use of OSHA safety standards in servicing electromechanical equipment.

Demonstrate competent technical writing skills.

Transfer Information:

The program is not specifically intended for transfer, but is considered on a case-by-case basis by Pennsylvania College of Technology.

The program is eligible for the Bloomsburg partnership for their - Bachelor of Applied Science in Technical Leadership, that guarantees 60 credits of transfer for successfully completed AAS degrees.

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

HVAC/R Service

Commercial Refrigeration

Building Automation

Facilities Maintenance