

## Heating, Ventilating, Air Conditioning and Refrigeration Technology

### ► Contact Information

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### ► Delivery Methods

Face-to-Face: Wahpeton

The Heating, Ventilating, Air Conditioning, and Refrigeration (HVAC/R) Technology program provides a balance of theory and application, in keeping with the philosophy of the North Dakota State College of Science. This includes a solid foundation of the principles of heating, ventilation, air conditioning, and refrigeration combined with extensive laboratory experience.

While in the lab, students learn to test, systematically troubleshoot, repair, and maintain electrical and mechanical HVAC/R systems and components. Residential and light commercial heating, ventilating, and air conditioning along with food preservation refrigeration are the focus of the program.

Because of the continuing demand for technicians, an HVAC/R graduate can easily find employment in any state or country. The average age of an HVAC/R technician in the US according to the US Department of Labor is 55 years old. In fact, an NDSCS HVAC/R graduate statistically has multiple jobs to choose from at graduation with starting salaries averaging \$37,000 per year (although most students have already found employment prior to graduation). Experienced veteran technicians command salaries averaging between \$70,000 and \$100,000 per year.

Career opportunities for technicians are multiplying with technological advances in the use of microcomputers for data processing and system control. The demand is also spurred by expansion in the production, storage, and marketing of food and other perishables.

The growing emphasis on energy cost and utilization also is creating a need for technicians to renovate, convert, and service existing heating and air conditioning systems. Graduates may work as service technicians, installation technicians, manufacturers, laboratory technicians, sales representatives, or designers.

**NOTE:** This program requires either an HP EliteBook 850 or ZBOOK 15 laptop or equivalent. Please refer to the NDSCS website for specifications. The cost will be approximately \$1065.00 for the EliteBook 850 and \$2100.00 for the ZBOOK 15, if purchased through NDSCS. For further information, contact the NDSCS ITS Department at 701-671-3333 option 5.

### Admission Requirements\*

The applicants must be high school graduates or equivalent. Students considered for acceptance must complete all admission requirements.

**Please Note:** Students are placed into English, math and reading courses based on ACT, ACCUPLACER or other nationally recognized tests. Please see [www.ndscs.edu/current-students/student-success/test-center](http://www.ndscs.edu/current-students/student-success/test-center) for the NDSCS Course Placement Policy and testing information. Students may be on an extended plan of study pending their course placement.

*\*Program Admission Requirements are subject to revision. Please check the department or program website under Program Admission Requirements for current information.*

### Award

Upon successful completion of the required courses, students will be awarded a certificate or an Associate in Applied Science degree in HVAC/R Technology.

Course Code	Course Title	Credits
<b>Certificate</b>		
REFG 101	Refrigeration Technology	3
REFG 102	Refrigeration Technology	3
REFG 104	Refrigerants: Chemistry and Ecology	1
REFG 110	Blueprint Reading and Estimating	2
REFG 111	Fabrication Lab	2
REFG 112	Domestic and Residential Systems Lab	2
REFG 113	Refrigeration Systems Lab	2
REFG 121	Electrical Theory I	3
REFG 122	Electrical Theory II	3
REFG 123	Electrical Lab I	2
REFG 124	Electrical Lab II	2
REFG 253	Heating Equipment Theory	2
REFG 255	Heating Equipment Lab	3

### Associate in Applied Science

REFG 201	Refrigeration Technology	3
REFG 202	Refrigeration Technology	3
REFG 211	Commercial Components Lab	2
REFG 212	Advanced Systems Lab	2
REFG 226	Building System Controls	3
REFG 231	Air Conditioning Design	3
REFG 232	Air Conditioning Design	3
REFG 254	Heat Pump Lab	2
REFG 256	Hydronic Heating Systems	3

### Related/General Education Courses

<b>Certificate</b>		
ENGL 105	Technical Communications	3
Social and Behavioral Sciences, Humanities, History and/or Computer Electives		2
Recommended:		
• CIS 101 – Computer Literacy – 2 cr		
FYE 101	Science of Success	1

### Associate in Applied Science

ENGL 110	College Composition I	3
English/Communication Elective (choose one)		3
ENGL 105	Technical Communications	
ENGL 120	College Composition II	
ENGL 125	Introduction to Professional Writing	
COMM 110	Fundamentals of Public Speaking	
MATH 120	Basic Mathematics I	2
MATH 123	Basic Mathematics II	2
MATH 125	Basic Mathematics III	2
Wellness Elective (HPER 210 recommended)		2
Social and Behavioral Sciences, Humanities, History and/or Computer Electives		4
Recommended:		
• CIS 101 – Computer Literacy – 2 cr		
• PSYC 100 – Human Relations in Organizations – 2 cr		
FYE 101	Science of Success	1

<b>Total Required Credits for Certificate</b>	<b>36</b>
<b>Total Required Credits for Associate in Applied Science</b>	<b>73</b>