

Environmental Systems and Refrigeration Technology (ESRT)

Degree Type

Certificate of Completion

Associate of Technical Science Degree

The environmental systems and refrigeration technology (ESRT) program at WVC offers a high level of instruction and prepares graduates to seek a wide variety of entry-level jobs. These include service technicians, mechanics, maintenance personnel, application engineers, electronic temperature controls specialists and environmental systems designers. Positions may be available in agricultural storage facilities, office buildings, shopping malls, schools, industrial plants and many other facilities around the world.

The ESRT program blends traditional classroom instruction with practical, hands-on lab work. Classes include refrigeration principles, applied electricity, air conditioning, heating systems, control fundamentals, DDC and PLC controls, boiler systems, and basic welding. Additional course work emphasizing energy efficiency includes efficient HVAC systems, energy load calculations, commissioning and TAB (Test, Adjust and Balancing). It is recommended that students start the program in fall quarter. The second year of the program is designed to allow students to work full time while in the program, by taking courses at night and short seminars offered on Thursdays/ Fridays and/or evenings. The final quarter of the program includes an internship and an independent capstone project emphasizing students' career aspirations. With permission, some on-the-job training internships may be substituted for lab work.

Before entering the ESRT program, students are strongly advised to complete one year of high school algebra or its equivalent. Course work in computers, basic electricity/ electronics and welding are also beneficial prior to entering the program. Prior to entry into the program, documentation of computer literacy is required. If students complete the ESRT associate of technical science (ATS) degree, they can earn electrical hours toward the Washington State Labor & Industry (06A) Electrical HVAC Specialty License. Upon graduation, students are also expected to have the OSHA 10 HVAC Safety card, the EPA 608 Refrigerant Handling Universal License and a current first aid card with CPR.

Suggested Course Sequence:

Associate of Technical Science Degree (requires all first-and second-year courses)

Basic HVACR and Controls Certificate of Completion (complete all three quarters of first-year classes)

Commercial/Industrial HVACR and DDC Controls Certificate of Completion (complete all three quarters of second-year classes, plus OCED 102* or higher, MATH 100* or higher, and BCT 116 or their equivalents)

Offered at Wenatchee campus

Total Credits	106
Course Sequencing	

First Year - Fall Quarter

Course ID	Title	Credits
ELEC 115	Applied Electricity	5.0
ESRT 102	OSHA 10 Safety Principles	1.0
ESRT 110	Refrigeration Principles	5.0
ESRT 114	Refrigerant Recovery/Recycle	1.0
ESRT 136	Indoor Air Quality	2.0
BCT 116	Professional Work Relations	3.0

First Year - Winter Quarter

Course ID	Title	Credits
ELEC 125	Wiring Diagrams and Schematics	5.0
ESRT 120	Heating Systems	5.0
ESRT 210	Boiler Systems	3.0
	MATH 100 or higher	5.0

First Year - Spring Quarter

[OCED 102](#): Placement score required.

Course ID	Title	Credits
ELTRO 132	Introduction to Computerized Controls and PLCs	5.0
OCED 102	Writing In The Workplace	5.0
ESRT 130	Air Conditioning & Heat Pumps	5.0
WELD 128	Basic Welding	3.0

Total Credits for Basic HVACR and Controls Certificate of Completion: 53

Second Year - Fall Quarter

Course ID	Title	Credits
ELTRO 202	Intro to National Electric Code (NEC)	2.0
ELTRO 210	Introduction to Programming TAG Based Software for PLCs	5.0
ELTRO 223	Programming Software for Tag-Based PLCs	5.0
ESRT 200	Commercial HVACR Equipment	5.0
ESRT 205	Blueprint Reading	2.0
ESRT 215	Commercial DDC HVAC Controls	3.0

Second Year - Winter Quarter

Course ID	Title	Credits
ELEC 225	Industrial Electricity & Controls	5.0
ELTRO 221	Graphic Interface Programs for PLCs	5.0
ESRT 220	Industrial Refrigeration Systems	5.0
	ESRT 222 or ESRT 296	3.0
ESRT 223	Design and Load Applications	3.0

Second Year - Spring Quarter

Course ID	Title	Credits
ESRT 230	Industrial Refrigeration Maintenance and Safety	2.0
ESRT 238	HVAC Commissioning, Leed and Tab Testing	3.0
ESRT 295	Capstone HVACR Project	2.0
ESRT 296	Cooperative Work Experience	1.0-5

Total Credits for Commercial/Industrial HVACR and DDC Controls Certificate of Completion: 53

(To receive the Commercial / Industrial HVACR and DDC Controls Certificate of Completion, you must complete all three quarters of second-year classes, plus OCED 102 or higher, MATH 100 or higher, and BCT 116 or their equivalents)

Total Credits for Associate of Technical Science Degree: 106

Program outcomes

Students who complete the ATS in Environmental Systems and Refrigeration Technology will have the skills and knowledge to:

- Obtain a 608 refrigerant license for employment and a Washington State HVACR Specialty Electrical 06A License.
- Work in the Refrigeration or HVAC industries as an entry level employee.
- Demonstrate the ability to work on refrigeration control circuits
- Troubleshoot an air conditioning and heat pump system.
- Service commercial refrigeration equipment
- Practice on the job safety precautions as it relates to refrigeration systems, including lock out tag out, fall prevention, and arc flash protection.
- Become employed in the HVACR industries using skills and techniques geared toward the refrigeration industry jobs
- Intelligently discuss various type of HVACR systems during a job interviews
- Obtain a RETA CARO entry-level license.

The ESRT two year ATS degree qualifies students to work in many various areas of the refrigeration industry including residential, commercial, institutional, and industrial as installers, operators, and maintenance personnel.

MATH 100 or higher

Elective Credits 5.0

Course ID	Title	Credits
MATH 100	Tech Math for Industrial Field	5.0

ESRT 222 or ESRT 296

Elective Credits 3.0

Course ID	Title	Credits
ESRT 222	Industrial Refrigeration Lab	3.0
ESRT 296	Cooperative Work Experience	1.0-5