

Environmental Systems and Refrigeration Technology

- **Associate of Technical Science Degree**
- **Certificate of Proficiency in:**
 - **Basic Refrigeration and Electricity (fall quarter, first year)**
 - **Heating and Schematics (winter quarter, first year)**
 - **Air Conditioning and Heat Pumps (spring quarter, first year)**
- **Certificate of Completion in:**
 - **Basic Electricity, Electronics and Controls (entire first year)**
 - **Industrial Refrigeration and Electricity (entire second year)**

The environmental systems and refrigeration technology (ESRT) program offers a high level of instruction in environmentally controlled systems including heating, ventilation, air conditioning and refrigeration (HVACR) emphasizing residential, commercial and industrial applications. It prepares graduates for a large variety of entry-level jobs, including service technicians, mechanics, maintenance personnel, application engineering, sales, supervision, electronic temperature controls specialists and environmental systems designers.

The employment outlook is very promising for graduates locally, regionally, nationally and internationally because of new indoor air quality requirements, increased residential and commercial construction, phase-outs of CFC refrigerants, global competition within developing countries, and the popularity of computerized controlled electronic refrigeration systems. Increased world population has also stimulated the construction of additional agricultural food storage and processing facilities, requiring more maintenance technicians to repair and service the equipment.

Graduates may find employment with service companies, mechanical contractors, temperature controls contractors, refrigerated agricultural storage warehouses, controlled atmosphere facilities, wholesale vendors, office buildings, shopping malls, apartment complexes, hotels, schools and industrial processing plants.

The ESRT program combines theory classes with practical, hands-on shop work. Classes include refrigeration principles, applied electricity, electronics, heating systems, programmable logic controls, indoor air quality, boiler systems, industrial safety, blueprints and basic welding.

Before entering the ESRT program, you 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, or BIT 105 Computer Applications, or instructor permission is required. A current first aid card with CPR endorsement is required upon graduation.

By completing the environmental systems and refrigeration technology ATS degree, you can earn electrical hours toward the Washington State Labor & Industry (06A), HVAC Refrigeration Specialty Electrical License.

Courses in the major field of study are usually taken during the quarter shown. However, general education and related supporting courses may be taken during different quarters according to student preference or course availability. Core program courses may have prerequisite requirements. English and mathematics courses require qualifying assessment score or acceptable preparatory coursework on those subjects. See course description for details.

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Suggested Course Sequence:

Certificate Program (requires completing all first-year courses)

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

Offered at Wenatchee campus

First Year

Fall Quarter		Credits
ELEC 115	Applied Electricity.....	5
ELTRO 101	Basic DC Circuits.....	5
ELTRO 102	Industrial Safety.....	1
ESRT 110	Refrigeration Principles.....	5
ESRT 114	Refrigeration Recovery/Recycle.....	1
BIT 116	Professional Work Relations.....	3

Winter Quarter

ELEC 125	Wiring Diagrams and Schematics.....	5
ELTRO 121	Digital Electronics.....	5
ENGL 100	Writing for the Workplace.....	5
ESRT 120	Heating Systems.....	5

Spring Quarter

ELEC 135	Control Fundamentals.....	3
ELTRO 132	Introduction to Computer Controls and PLCs.....	5
ESRT 130	Air Conditioning.....	3
ESRT 134	Heat Pump Repair.....	2
MATH 100T	Technical Math*.....	5
Total		58

Second Year

Fall Quarter		Credits
ELTRO 202	Introduction to Electrical Codes.....	2
ELTRO 210	Program Software for PLCs.....	5
ENGR 102	Introduction to Graphics/Blueprints.....	4
ESRT 200	Commercial Refrigeration.....	5
ESRT 210	Boiler Systems.....	2

Winter Quarter

ELEC 225	Industrial Electricity/Controls.....	5
ELTRO 220	Control Devices and Motor Drives.....	3
ELTRO 221	Graphic Programs for PLCs.....	4
ESRT 220	Industrial Refrigeration I.....	5
ESRT 223	Design and Load Computer Applications ..	2

Spring Quarter

ELTRO 231	Troubleshooting Electrical PLC Systems ...	5
ELTRO 239	Hydraulics and Pneumatics.....	3
ESRT 136	Indoor Air Quality.....	2
ESRT 230	Industrial Refrigeration Maintenance and Safety.....	3
WELD 128	Basic Welding	3
Total		53
Total Credits for Degree		111

Note: Completion of high school algebra and English or program director's approval required for entry into program.

**Assessment score required.*