

# PLUMBING AND HEATING TECHNOLOGY (AS)

## Program Overview Associate in Science Degree



The Associate in Science Degree in Plumbing and Heating is a program offered jointly through the Plumbing Department and the Heating Department.

Plumbing/Heating is a comprehensive program designed to train students as entry-to-industry level technicians. Students are taught the basic theory and practices of plumbing and heating and receive hands-on experience in a laboratory setting. The program offers a curriculum combining two distinct but interconnected areas: heating in residential structures and plumbing in residential, commercial, and industrial structures.

The four-term plumbing portion of the program includes the study of basic tools; methods of fabrication; fitting identification and usage; drainage; waste and venting; water piping methods and design; sewage disposal and treatment; water sources and distribution; and household and industrial maintenance. Sustainability issues using rainwater harvesting and gray water technology are stressed.

In the heating portion of the program (distributed over two terms), various heating systems are examined such as steam, warm air, and forced hot water. Also presented are the burners used in conjunction with these systems and their associated control circuitry. Special consideration is given to electrical wiring, heat loss calculations, and system design as they relate to a residential and commercial application. Included in the Heating Program are courses in the installation of heating systems, gas technology, solar heating systems, and introduction to welding.

The theory and lab experience include the design, installation, troubleshooting, and servicing of a vast array of heating units.

Graduates are prepared for technician positions in the plumbing and heating industry. In addition, graduates of this program area are eligible to continue on for a Bachelor of Science Degree in Business Management.

## Curriculum

Course	Title	Quarter Credit Hours
<b>Term I</b>		
PL 114	Pipe Fitting Basics	4
PL 119	Pipe Fitting Basics Lab	3
PL 118	Blueprint Reading and Drafting	3
AH 100	Introduction to the Professional Service Trades	3
OSH 010	OSHA Construction Safety & Health	2
<b>Quarter Credit Hours</b>		<b>15</b>
<b>Term II</b>		
PL 124	Drainage, Waste and Vent Design	4
PL 127	Drainage, Waste and Vent, and Potable Water System Lab	3
PL 126	Potable Water Piping Design	3
MA 105	Basic College Math with Lab (MA/SCI Core) <sup>1</sup>	5
<b>Quarter Credit Hours</b>		<b>15</b>
<b>Term III</b>		
PL 230	Plumbing Fixture, Appliance and Appurtenance	4
PL 235	Plumbing System Design and Fixture Installation Lab	3
PL 232	Troubleshooting and Repair	2
AH 125	Basic Electricity	2
AH 118	Basic Electricity Lab	2
MA 125	Technical Math I (MA/SCI Core) <sup>1</sup>	4
<b>Quarter Credit Hours</b>		<b>17</b>
<b>Term IV</b>		
PL 240	Pump System Design	4
PL 245	Pump System Design Lab	3
PL 246	Final Project	2
Elective	100-200 Level Humanities Core <sup>1</sup>	4
EN 106	Service Industry Communications (COM Core) <sup>1</sup>	5
<b>Quarter Credit Hours</b>		<b>18</b>
<b>Term V</b>		
AH 234	Modern Heating Systems	4
AH 235	Modern Heating Systems Lab	2
AH 238	Gas Heating Systems	4
AH 242	Gas Heating Systems Lab	3
EN 100	Introduction to College Writing (COM Core) <sup>1</sup>	4
<b>Quarter Credit Hours</b>		<b>17</b>
<b>Term VI</b>		
AH 240	Blueprints, Pipe Fitting and Duct Layout	4
AH 241	Blueprints, Pipe Fitting and Duct Layout Lab	2
WEL 110	OFC/OAW, Electric Welding and Cutting	3
SS 236	Small Business and the Law	4

Elective	100-200 Level Humanities Core <sup>1</sup>	4
<b>Quarter Credit Hours</b>		<b>17</b>
<b>Total Quarter Credit Hours</b>		<b>99</b>

<sup>1</sup> Liberal Arts Core.

## Legend

C = Number of lecture hours per week

L = Number of laboratory hours per week

T = Total Quarter Credit Hours where each lecture hour per week is one credit, every 2-4 laboratory hours are one credit depending on the expected amount of pre- or post-lab work.

All associate degree students are required to take 32 credits of liberal arts and math/science courses as selected from the liberal arts core. See the course descriptions section of this catalog for a list of the core area courses. Students who place out of MA 105 Basic College Math with Lab/MA 110 Introduction to College Math must still take 32 credits of core courses.

Subject to change.

## Program Mission, Goals, and Outcomes

### Program Mission

The mission of the Plumbing Technology (PLBH) program is to provide Associate in Science degree in Plumbing and Heating Technology. The program offers a curriculum combining two distinct but interconnected areas: heating, with residential structures; and plumbing, with residential, and light commercial structures. Through a combination of classroom theory and hands-on laboratory training, students are given the opportunity to acquire the skills required for entry-level employment in the plumbing and heating industry.

### Program Goals

1. The PLB program will provide students with the appropriate knowledge and skills in basic construction methods and blueprint reading; using basic plumbing tools; methods of fabrication; fitting identification and usage; drainage; waste and venting; water piping methods and design; sewage disposal and treatment; water sources and distribution; and residential and light commercial maintenance.
2. The heating portion of the PLB program will examine various heating systems such as steam, warm air, forced hot water and gas-fired equipment as well as the burners used in conjunction with these systems and their associated control circuitry.

## PLUMBING DEPARTMENT

### Program Outcomes

Graduates of this program will be able to:

1. Produce piping installations from specification sheet guidelines utilizing appropriate tools and pipefitting techniques with ABS, PVC, no-hub cast iron, threaded black iron, copper, CPVC and PEX pipe and fittings.
2. Design and install a residential kitchen and bathroom from rough-in to finish fixture placement utilizing an ABS or PVC drainage, waste and vent system and a copper or CPVC branch style potable water supply system that meets current International Plumbing Code standards.

3. Install and repair residential and light commercial bathroom plumbing fixtures, and their respective potable water supply and drainage trap connections.
4. Design and install a shallow well jet, deep well submersible and jet pump booster system for potable water or grey water supply. Design and install a submersible sump or sewage pump system for waste water drainage or rainwater harvesting.
5. From a residential floor plan drawing – size the plumbing system, create isometric plumbing system drawings, estimate pipe, fittings, materials and fixtures, and estimate the labor hours needed to install a complete, code approved plumbing system.

## HEATING DEPARTMENT

### Program Mission

The mission of the Heating Technology Program is to provide an integral component to the Associate Degree programs in Refrigeration, Air-Conditioning, Heating Technology and Plumbing Heating Technology. The Heating Technology program is focused on providing basic essential training to students in preparation for their entry into the fields of oil and gas heating and pipefitting. This training is designed for those students who have recently graduated from high school as well as adults who are seeking a different career path to follow. Through a combination of classroom theory and hands-on laboratory training, students are given the opportunity to acquire the skills required for entry-level employment in the heating industry.

### Program Goals

The Heating Technology Program will provide the appropriate training for students to:

1. Develop theoretical knowledge of systems, their components and function.
2. Gain an understanding of tools and equipment used in the heating field and how to put them to proper use.
3. Use the knowledge acquired in the classroom and display proficiency in the lab while working on equipment readily found in real-life installations.
4. Qualify for the Rhode Island Oil Burner Journeyman Technician's license.
5. Enter the workforce with the ability to interact appropriately with customers, vendors and fellow tradespersons.

### Program Outcomes

Graduates of this program will be able to:

1. Exhibit knowledge of combustion efficiency testing using instruments. Special consideration is given to electricity and wiring, and heat loss calculations and system design as they relate to a residential application.
2. Demonstrate a procedure for testing electrical circuits by using a Volt-OHM-Milliamp Meter.
3. Calculate heat loss for single-family dwellings and small commercial buildings and properly design a multi-zone series loop system for that structure.
4. Design a fuel delivery system with natural gas and propane for a residential and light commercial application and develop

a complete parts list for the installation of that system in accordance with NFPA 54.

5. Install and troubleshoot heating controls for the following parameters: temperature, humidity, pressure and ventilation to create an efficient system.
6. Install furnaces and boilers with ductwork and piping.

## Q&A and Technical Standards Questions & Answers

### 1. When do my classes meet?

**Day Classes:** Technical classes normally meet for at least three hours a day for up to five days a week. Classes normally begin in the early morning (7:45 a.m.), late morning (usually 11:25 a.m.), or mid-afternoon. The time slot for your program may vary from term to term.

**Evening Classes:** Technical classes meet on the average of three nights a week, although there may be times when they will meet four nights a week. Classes normally begin at 5:45 p.m.

In addition, to achieve your associate degree, you will take a total of approximately eight liberal arts courses, which will be scheduled around your technical schedule over the course of your entire program. Each liberal arts course meets approximately four hours per week. Liberal arts courses are offered days, evenings, and Saturdays.

At the beginning of each term you will receive a detailed schedule giving the exact time and location of all your classes. The College requires that all students be prepared to take classes and receive services at any of NEIT's locations where the appropriate classes and services are offered.

When a regularly scheduled class falls on a day which is an NEIT observed holiday (Columbus Day, Veterans Day, Martin Luther King, Jr. Day, and Memorial Day), an alternate class will be scheduled as a make up for that class. The make up class may fall on a Friday. It is the student's responsibility to take note of when and where classes are offered.

### 2. How large will my classes be?

The average size for a class is about 20 to 25 students; however, larger and smaller classes occur from time to time.

### 3. How much time will I spend in lab?

Almost half of your technical courses consist of laboratory work. In order for you to get the most out of your laboratory experiences, you will first receive a thorough explanation of the theory behind your lab work.

### 4. Where do my classes meet?

Students should be prepared to attend classes at any of NEIT's classroom facilities: either at the Post Road, Access Road, or East Greenwich campus.

### 5. I have not earned my high school diploma or GED: can I enroll in an Associate Degree Program?

A candidate for admission to an associate degree program must have a high school diploma, have earned a recognized equivalency diploma (GED), or meet the federal home school requirements.

### 6. How long should it take me to complete my program?

To complete your degree requirements in the shortest possible time, you should take the courses outlined in the prescribed curriculum. This technology is a six-term curriculum, and a student may complete the requirements in as little as 18 months.

To complete all your degree requirements in the shortest time, you should take at least one liberal arts course each term.

Students may also elect to complete some of their liberal arts requirements during Intersession (except for EN courses), a five-week term scheduled between Spring and Summer Terms. Students will not be assessed any additional tuition for liberal arts courses taken during the Intersession but may be assessed applicable fees.

Students wishing to extend the number of terms needed to complete the required technical courses in their curriculum will be assessed additional tuition and fees.

### 7. Is NEIT accredited?

NEIT is accredited by the New England Commission of Higher Education. Accreditation by NECHE is recognized by the federal government and entitles NEIT to participate in federal financial aid programs. Some academic departments have specialized professional accreditations in addition to accreditation by NECHE. For more information on accreditation, see NEIT's catalog.

### 8. Can I transfer the credits that I earn at NEIT to another college?

The transferability of a course is always up to the institution to which the student is transferring. Students interested in the transferability of their credits should contact the Office of Teaching and Learning for further information.

### 9. Can I transfer credits earned at another college to NEIT?

Transfer credit for appropriate courses taken at an accredited institution will be considered upon receipt of an official transcript for any program, biology, science, and mathematics courses in which the student has earned a "C" or above within the past three years and for English or humanities courses in which the student has earned a "C" or above within the last ten years. An official transcript from the other institution must be received before the end of the first week of the term for transfer credit to be granted for courses to be taken during that term. Students will receive a tuition reduction for the approved technical courses based on the program rate and will be applied against the final technical term of the curriculum's tuition amount. No tuition credit is provided for courses which are not a part of the technical curriculum.

### 10. What is the "Feinstein Enriching America" Program?

New England Institute of Technology is the proud recipient of a grant from the Feinstein Foundation. To satisfy the terms of the grant, the College has developed a one-credit community enrichment course which includes hands-on community enrichment projects. The course can be taken for a few hours per term, spread over several terms. Students who are already engaged in community enrichment on their own may be able to count that service towards course credit.

### 11. How many credits do I need to acquire my Financial Aid?

In order to be eligible for the maximum financial aid award, you need to maintain at least 12 credits per academic term.

### 12. What does my program cost?

The cost of your program will be as outlined in your enrollment agreement, along with your cost for books and other course materials. Students who decide to take more terms than the enrollment agreement describes to complete the technical courses in their curriculum will be subject to additional fees and possible additional tuition costs. Students who elect to take the technical portion of the degree requirements at a rate faster than the rate prescribed in the curriculum and the enrollment agreement will be assessed additional tuition.

Students who require prerequisite courses will incur additional tuition and fees above those outlined in their enrollment agreement.

If a student elects to take a course(s) outside of the prescribed curriculum, additional tuition and fees will be assessed.

Remember, students who withdraw and re-enter, one time only, pay the tuition rate that was in effect for them at the time of their last day of attendance for up to one year from their last day of attendance. Second re-entries and beyond pay the tuition rate in effect at the time they re-enter. The most economical way for you to complete your college degree is to begin your program now and continue your studies straight through for the six terms necessary to complete your degree requirements.

### 13. What kind of employment assistance does NEIT offer?

The Career Services Office assists NEIT students and graduates in all aspects of the job search, including resume writing, interviewing skills, and developing a job search strategy. Upon completion of their program, graduates may submit a resume to the Career Services Office to be circulated to employers for employment opportunities in their fields. Employers regularly contact us about our graduates. In addition, our Career Services Office contacts employers to develop job leads. A strong relationship with employers exists as a result of our training students to meet the needs of industry for over fifty years. No school can, and NEIT does not, guarantee to its graduates employment or a specific starting salary.

### 14. Where will job opportunities exist?

Graduates have obtained employment in the local area. However, one of the most exciting aspects of this program is the ability to look nationally for employment opportunities.

### 15. Is there any state or federal licensing required in my field?

Because of the complex nature of state licensing requirements and because those requirements change periodically, NEIT cannot list all the requirements for the various types of licenses in the various states.

Under current Rhode Island law, a student who obtains an associate degree in plumbing and has been registered with the Rhode Island Department of Labor and Training as an apprentice plumber for at least two (2) years and is employed as a registered apprentice by a duly licensed master plumber in Rhode Island for a period of two (2) years, may sit for the test for a journeyman's license in Rhode Island. (R.I.G.L. Section 5-20-17).

NEIT IS NOT RESPONSIBLE FOR ANY CHANGES IN LICENSING REQUIREMENTS THAT ANY STATE LEGISLATURE MAY IMPLEMENT AT ANY TIME, INCLUDING RHODE ISLAND.

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## Technical Standards

These technical standards set forth by the Refrigeration/ Air Conditioning, Heating and Plumbing Departments, establish the essential qualities considered necessary for students admitted to these programs to achieve the knowledge, skills and competencies to enter these fields. The successful student must possess the following skills and abilities or be able to demonstrate that they can complete the requirements of the program with or without reasonable accommodation, using some other combination of skills and abilities.

## Cognitive Ability

- Ability to deal with materials and problems such as organizing or reorganizing information.
- Ability to use abstractions in specific concrete situations.
- Ability to break information into its component parts.
- Ability to understand spatial relationships.
- Possession of basic math skills through addition, subtraction, multiplication and division of whole numbers and fractions using both the U.S. and Metric systems of measurement.
- Ability to demonstrate and use the knowledge acquired during the classroom training process and in the lab setting.

## Communications Skills

- Ability to communicate effectively with others including faculty and students.

## Adaptive Ability

- Ability to respond in an appropriate manner to stressful situations.
- Ability to maintain emotional stability and the maturity necessary to interact with other members of the faculty and students in a responsible manner.

## Physical Ability

- Ability to perform tasks requiring bending, stooping, squatting, kneeling, lying, climbing and walking.
- Ability to lift, lower, push, and pull using both arms and legs.
- Ability to grasp, lift and carry tools and equipment weighing fifty (50) pounds 50 - 500 feet from truck to work area.
- Ability to climb stairs and ladders to 25 feet.
- Agility and strength sufficient to allow bodily maneuvering in small spaces.
- Sufficient strength and agility to grasp and maintain tension for long periods of time.
- Ability to wear and tolerate ear plugs, safety glasses and other protective equipment.
- Ability to perform learned skills, independently, with accuracy and completeness within reasonable time frames in accordance with procedures.

## Manual Ability

- Sufficient manual dexterity and fine motor coordination to manipulate small objects within a limited space.
- Sufficient manual dexterity and motor coordination to coordinate hands, eyes and fingers in the operation of tools and other equipment.

## Sensory Ability

### Visual

- Acute enough to distinguish colors, read blueprints, inspect equipment for proper installation and work in dimly lit areas such as basements and boiler rooms.
- Acute enough to read small print.
- Acute enough to read small numbers on precision measuring instruments.



### **Auditory**

- Auditory ability, acute enough to detect sounds, changes in sounds, or lack of sounds emitted by heating and air-conditioning equipment.

## **Degree Progress Checklist**

### **Plumbing and Heating Technology - AS**

#### **Degree Progress Checklists**

- For students entering October 2024 or later
- For students entering April 2024 to September 2024
- For students entering October 2023 to March 2024
- For students entering July 2020 to September 2023