

# APPT 168: MEDICAL GAS/ HYDRONICS/SIGNAL PERSON

## Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2022
Units:	4.5
Hours:	36 lecture, 66 laboratory per quarter (102 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing & Pipefitting Apprenticeship Program.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade Only
Repeatability:	Not Repeatable

## Student Learning Outcomes

- A student will be able to receive N.I.T.C. medical gas installer and braze certification.
- A student will be able to apply pipe sizing methods for all hydronic heating and cooling systems.

## Description

Fourth-year course of the Plumbing and Pipefitting Apprenticeship program. This course provides students with a working knowledge of medical gas, brazer, crane signaling, and hydronic systems.

## Course Objectives

The student will be able to:

- Receive N.I.T.C. Medical Gas Installer and Brazer certification
- Size piping systems and equipment related to hydronic systems
- Become NCCCO Crane Signal Person certified (National Commission for the Certification of Crane Operators)

## Course Content

- N.I.T.C. certification
  - NFPA 99 certification
- Piping system sizing
  - Sizing up hydraulic systems
  - Sizing up hydronic systems
- National Commission for the Certification of Crane Operators (NCCCO) course requirements
  - Mobile crane operator practice exam
  - Tower crane operator practice exam
  - Overhead crane operator practice exam
  - Crane inspection, methods and techniques

## Lab Content

Students will work individually and in teams to prepare and size medical gas and hydronic equipment in the lab, which includes:

- Piping systems
- Convection, conduction, radiation
- Radiators
- Heat pumps
- Pre-cool and chilled water
- Boilers
- Controls
- Pumps

## Special Facilities and/or Equipment

- Laboratory with medical gas and hydronic equipment
- Personal protective equipment
- Calculator
- When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address

## Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Written examination  
Hands-on demonstration  
Chapter quizzes  
Group and classroom participation  
Punctuality

## Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture  
Discussion  
Laboratory  
Demonstration

## Representative Text(s) and Other Materials

International Codes and Standards Organization. [NFPA 99 Health Care Facilities Code](#). 2020.

International Pipe Trades Joint Training Committee, Inc.. [Hydronic Heating and Cooling](#). 2016.

International Pipe Trades Joint Training Committee, Inc.. [Signal Person Training Guide](#). 2019.

Texts older than five years may be utilized in this course as industry-standard texts.

## **Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments**

- a. Readings from the NFPA 99 textbook (National Fire Protection Agency) section 99
  - i. The application of medical gas and vacuum systems
  - ii. The design of hydronic, heating and cooling systems in a controlled environment
  - iii. The ability to signal cranes safely
- b. Writing assignments are part of the homework assignments from readings, and practice quizzes at the end of each chapter in the textbook, [NFPA 99 Health Care Facilities Code](#), and the [Signal Person Training Guide](#)

## **Discipline(s)**

Plumbing