

# **PLUMBING II**

**MARCH 2006**

## **PLUMBING II**

### **I. COURSE DESCRIPTION**

The plumbing II course continues to develop the entry-level skills necessary for success in the plumbing trade. This course will enable the student to identify, describe, and use the different types of valves used in various systems of the plumbing trade. Students will learn and be able to demonstrate knowledge of the basic principles of the National Plumbing Code. Students will also learn to read blue prints and create simple isometric drawings of plumbing systems. The student will demonstrate a working knowledge of piping materials and fittings and install tub/shower valves and faucets. Students will learn how to rough in water, waste and vent pipes for three fixture unit bathrooms. They will understand how to select appropriate materials, complete a materials list, and estimate costs for a specific plumbing job. Students will continue to utilize basic computer skills for web-based projects and continue to explore the many career opportunities available in plumbing.

### **II. COURSE OBJECTIVES/OUTLINE**

#### **A. PLUMBING II**

The student will be able to:

1. Describe the use of different types of valves used in the plumbing system. (9.1A;B. 9.2A;B;C;D;E;F)
2. Read a blueprint and make simple isometric drawings. (9.1A;B. 9.2A;B;C;D)
3. Repair faucets. (9.1B. 9.2B;F)
4. Install tub/shower valves. (9.1B. 9.2B;F)
5. Demonstrate knowledge of materials and complete material lists. (9.1B. 9.2A;B;C;D)
6. Install basic rough in of pipes and fittings for a three-group bathroom. (9.1B. 9.2A;B;C;E;F)
7. Install no-hub pipe and fittings. (9.1B. 9.2B;F)
8. Identify basic principals of the National Plumbing code. (9.1A;B. 9.2A;B;C;D;E;F)
9. Continue with web-based projects. (9.1A;B;9.2A;B;D)

## B. TYPES OF VALVES IN THE PLUMBING INDUSTRY

The student will be able to:

1. Recognize and name different types of valves used in the plumbing trade. (9.1B. 9.2B)
2. State the applications of each type of valve. (9.1A;B. 9.2A;B;C;E)
3. Explain the construction and material types of various valves. (9.2B;D)
4. Illustrate how different types of valves operate. (9.2A;C)

## C. BASIC PRINCIPALS OF THE NATIONAL PLUMBING CODE

The student will be able to:

1. Understand that the code protects the health of the community. (9.2D;F)
2. Be aware of the twenty-two principals of the National Plumbing Code. (9.1B. 9.2A;B;C;D;F)
3. Describe the process for obtaining plumbing permits. (9.1A. 9.2B;E)
4. Determine where plumbing permits are not required under the National Plumbing Code. (9.2A)
5. Apply code requirements to a shop plumbing installation. (9.1B. 9.2A;B;C;F)

## D. PLANS AND ISOMETRIC DRAWINGS

The student will be able to:

1. Recognize plumbing symbols and abbreviations used in architectural drawings. (9.1B. 9.2A;B;D)
2. Take dimensions off of drawings in inches and feet. (9.1B)
3. Scale drawings using an architect's scale ruler. (9.1B)
4. Prepare two-dimensional waste, vent and water drawings. (9.1b. 9.2A;B;C;D)

## E. PIPING MATERIAL AND FITTINGS

The student will be able to:

1. Name the various materials used in plumbing pipe and fittings. (9.1B. 9.2A)
2. Give appropriate applications for each type of material. (9.1B. 9.2A;B;C)
3. Properly name the various types of fittings and pipe. (9.1B. 9.2A;B)
4. List the grades and sizes of pipe and fittings. (9.1B)
5. Interpret markings used on plastic and copper pipes. (9.1B)
6. Understand the technical terms of pipe materials and fittings. (9.1B. 9.2A;B;D)

## F. INSTALLATION OF TUB/SHOWER VALVES AND FAUCETS

The student will be able to:

1. Describe and demonstrate installation procedures for plumbing tub/shower valves and faucets. (9.1B. 9.2A;B;F)
2. Describe and demonstrate the installation procedures for plumbing fixtures. 9.1B. 9.2A;B;F)
3. Identify special tools needed to install fixtures, faucets, and tub/shower valves. (9.1A;B. 9.2A;B)

## G. PLUMBING CAREER OPPORTUNITIES

The student will be able to:

1. Use resources in identifying job opportunities within the plumbing industry. (9.1A;B. 9.2A;B;C;D;E)
2. List qualifications for success in the plumbing trades. (9.1A;B. 9.2A;B;C;D;E)
3. Understand the basic educational requirements for their entry into a plumbing apprenticeship. (9.1A. 9.2A;B;D)
4. Understand the importance of desirable employees. (9.1A;B. 9.2B;C;D)
5. Describe the process of getting and keeping their jobs. (9.1A;B. 9.2A;B;C;D;F)

## H. COMPUTER PROJECTS FOR LAYMAN SEEKING INSTRUCTIONAL GUIDELINES

The student will be able to:

1. Research the problem. (9.1A;B. 9.2A;B;C;D;E)
2. Define simple solutions to the problem. (9.1B.9.2A;BC)
3. Organize pictures and videos for instructional use. (9.1A;B. 9.2A;B;C;D)
4. Formulate new concepts to enhance the website. (9.1A;B. 9.2A;B;C;D;E)
5. Annually update the websites repair and installation procedures. (9.1A;B. 9.2A;B;D)

## III. TEXTBOOKS AND INSTRUCTIONAL MATERIALS

National Standard Plumbing Code Illustrated

PHCC 2000

Plumbing Heating and Cooling Contractors.

Modern Plumbing. E. Keith Blankenbaker. Price; Goodheart-Willcox 2005

(Includes teacher edition-test bank and workbook).

Plumbing Technology. Lee Smith, Price; Delmar (Thomson Learning 2000).

(Includes teacher edition-test bank).

## IV. INSTRUCTIONAL STRATEGIES

In order to meet the individual needs of our students, differentiated instruction is utilized in every class. This involves the use of a variety of instructional strategies, including but not necessarily limited to: readings and exercises from the approved text(s) and related supplemental materials; hands-on practical projects; cooperative group activities; teacher generated handouts; lecture in conjunction with class discussion and notes; debates; role playing activities; map work; activities involving music and art from relevant historical eras; oral and written reports; simulations; primary resource based analysis and questioning; multimedia documentaries, movies, and slideshows; and Internet and ITV presentations and

conferences.

## V. EVALUATION

Students will be evaluated objectively in accordance with state and local guidelines. It is our goal to afford students every opportunity to succeed and to include both formative and summative methods of assessment. A wide variety of evaluation methods will be utilized in order to accommodate the multiple intelligences of our students, and incorporate the variety of learning styles and diversification of instructional methods. Evaluation methods will include, but are not necessarily limited to, the following:

- Tests and Quizzes (questioning strategies include essay, multiple choice, true and false, matching, fill in the blank, and short answer);
- Projects;
- Classroom activities;
- Research;
- Reports;
- Notebook maintenance;
- Class participation;
- Rubrics;
- Portfolios;
- Teacher observation; and,
- if applicable, Career Supervisor Co-op performance.

Evaluations may be oral, written or otherwise expressed depending on the direction of the instructor. Evaluation criteria will address the 2004 New Jersey Core Curriculum Content Standards. (CCCS 9.1,9.2)

## VI. SCOPE AND SEQUENCE CHART

Key I = Introduced  
D = Developed in Depth  
R = Reinforced

### SKILL TO BE LEARNED

11      12

Identify/describe the use of different types of valves in plumbing system	ID	IDR
Demonstrate knowledge of basic principals of the National Plumbing Code.	ID	IDR
Gain knowledge in blue print reading.	ID	IDR
Make simple isometric drawings.	ID	IDR
Install tub/shower valves and faucets.	IDR	IDR
Repair plumbing fixtures.	IDR	IDR
Install (rough-in) for three unit bathroom.	IDR	IDR

Web-based projects for instructional use.  
Understand the many plumbing career opportunities.  
Demonstrate a knowledge of piping materials and fittings

ID IDR  
IDR IDR  
IDR IDR

## STUDENT HANDOUT

### PLUMBING II

#### COURSE OVERVIEW

The plumbing II course provides the student with the continuation of entry-level skills into the plumbing trade. This course will enable the student to identify and describe the use of different types of valves used in the various systems of the plumbing trade. The student will be able to demonstrate a knowledge of the basic principles of the National Plumbing Code. Throughout this course reading blue prints and making simple isometric drawings will be incorporated. Demonstrate a working knowledge of piping materials and fittings. Install tub/shower valves and faucets. Students will learn how to rough in water, waste and vent pipes for three fixture unit bathrooms. Students will gain knowledge on how to “pick out” materials and complete a material list for a specific plumbing job. Students will begin basic computer skills for web-based projects. Students will also begin to understand the many plumbing career opportunities that are going to be available to them.

#### PROFICIENCIES

1. Describe the twenty-two principals of the National Plumbing Code.
2. Read a blue print and make simple isometric drawing.  
Demonstrate good habits of health and shop safety.
3. Install tub/shower valves and faucets.
4. Demonstrate the ability to repair faucets and fixtures.
5. Demonstrate knowledge of pipe materials and fittings.
6. Complete a designated project material list.