

2. Overhead Projector
3. Drafting tools
4. Transparencies
5. Set of working drawing
6. TV & VCR

VIII. TEXT AND REFERENCES:

- A. Text:: Instructor's made handouts
- B. Reference:

Blankenbaker, Keith E. Modern Plumbing. south Holland: The Goodheart-Wilcox, 1997.

Smith, Lee, and Harry Slater. Plumbing Technology: Design and Installation . Albany: Delmar, 1989.

IX. METHOD OF INSTRUCTION:

1. Lecture
2. Discussion
3. Demonstration
4. Laboratory
5. Field trip (Site observation)

X. METHOD OF EVALUATION:

Lecture presentation is tested on written test. Lab evaluation is based on skill development and knowledge acquisition.

Four criteria is used in evaluating projects and operation performance are:

1. Accuracy
2. Techniques
3. Appearance
4. Completion

The components used in the computation of the final grade are:

1. Participation.....	25%
2. Quizzes/Homework.....	10%
3. Mid – Term and Final Test.....	25%
4. Projects.....	40%
Total.....	100%

The transmutation of percent to letter grade are:

90 – 100.....	A
80 – 89.....	B
70 – 79.....	C
65 – 69.....	D
0 – 64.....	F

TASK LISTING SHEET

PL 110 PLUMBING FOR NON - MAJORS

Credits: 2 1 48
Lecture lab Total Lab Hrs.

TASK

TIME

SLO #1:

12hrs

1. Prepare a basic list of tools of tools for a plumber who installs residential plumbing systems. Study supplier catalogs or visit a local hardware store to obtain specific information about tools that can be purchased.
2. Compare amount of torque that can be applied to a pipe or bolt with different length wrenches when specified amounts of pressure(weight) is applied to the wrench.
3. On an assigned project, choose the tools required and use the tools properly and safely.

SLO #2

8hrs

1. Wear appropriate clothing that it meets the standard established.
2. Check all portable electrical tools in the shop with voltmeter
3. On an assigned project demonstrate proper lifting and carrying of heavy objects, use of ladders and scaffoldings, and handling plastic cement solvent.
4. Demonstrate safe usage of hand tools, power tools, and shop equipments on a given task.

SLO #3

10hrs

1. Given a selected group of fittings illustrate their usage and application.
2. From catalogs or contracts with local suppliers, obtain the cost of selected fittings and pipes made from different materials. Compare the cost of materials.
3. After interviewing several journeyman plumbers, compare relative merits of copper, cast iron, plastic, and galvanized, iron piping system.
4. On an assigned project, demonstrate proper connecting methods applied on various types of pipe and fittings.

SLO #4**8hrs**

1. After visiting several plumbing suppliers for kitchen and bathroom faucets, select at least two faucet styles and secure the list price for these faucets.
2. Given a selected group of valves, demonstrate their installation process, and illustrate their function.
3. Using drawing and a written description, illustrate function of each water valve and the location of each water control valve in a typical residential installation.
4. Given a selected water meters, demonstrate their installation process, and illustrate their function.

SLO #5**10hrs**

1. After visiting several plumbing fixtures suppliers, compare the following:
 - A. Variety of sinks and lavatories available and how the rough-in dimensions may vary.
 - B. Variety of water closets available and how the rough-in dimensions may vary.
 - C. Different types of bathtubs and showers available and how their installations may be different.
2. Talk to at least two sales representatives to discuss the merits of different types plumbing fixtures.
3. Talk to at least two plumbing contractors to discuss special problems encountered when installing plumbing fixture.
4. Given a selected types of fixtures, demonstrate their installation process.

TOTAL**48hrs**

**Course Level Achievement
Form A
(Used for shop courses as well as other program
PL110 PLUMBING FOR NON - MAJORS**

Student's Name (print): _____

Semester/Year: _____

Instructor's Name: _____

Directions: Evaluate the student using the rating scale below and encircle the appropriate number to indicate the degree of competency. The numerical ratings of 5, 4, 3, 2, and 1 are not intended to represent the traditional school grading system of A, B, C, D, and F. the descriptions opposite the numbers will determine the level of student performance for each of the competencies listed below.

- Rating Scale: 5 Excellent
 4 Above average
 3 Average
 2 Below average
 1 Unacceptable

COMPETENCY	RATING
1. Apply personal workplace safety.	5 4 3 2 1
2. Use and maintain plumbing hand tools, power tools, and shop equipment.	5 4 3 2 1
3. Select, layout, and connect pipes and fittings.	5 4 3 2 1
4. Install plumbing fixtures.	5 4 3 2 1

I certify that the student has completed all the competencies in this program and has achieved ratings as shown under each respective competency.

Instructor's signature

Date

COPMPETENCY #1 Apply personal and workplace safety.

5. Demonstrate ability to perform all the required personal and workplace safety skills including wearing personal and workplace safety gears, follow personal and workplace safety precaution, apply tools and equipment safety, and observe materials and supplies hazards according to OSHA standards with 90 – 100% accuracy.
4. Demonstrate ability to perform all the required personal and workplace safety skills including wearing personal and workplace safety gears, follow personal and workplace safety precaution, apply tools and equipment safety, and observe materials and supplies hazards according to OSHA standards with 80 – 89% accuracy.
3. Demonstrate ability to perform all the required personal and workplace safety skills including wearing personal and workplace safety gears, follow personal and workplace safety precaution, apply tools and equipment safety, and observe materials and supplies hazards according to OSHA standards with 70 – 79% accuracy.
2. Demonstrate ability to perform all the required personal and workplace safety skills including wearing personal and workplace safety gears, follow personal and workplace safety precaution, apply tools and equipment safety, and observe materials and supplies hazards according to OSHA standards with 65 – 69% accuracy.
1. Demonstrate ability to perform all the required personal and workplace safety skills including wearing personal and workplace safety gears, follow personal and workplace safety precaution, apply tools and equipment safety, and observe materials and supplies hazards according to OSHA standards with bellow 65% accuracy.

COMPETENCY #2 Use and maintain plumbing hand tools, power tools, and shop equipment.

5. Demonstrate all of the basic skills required to properly use and maintain hand tools, power tools, and shop equipment including safe and proper usage, preventive maintenance, and proper storage according manual and specification with 90- 100% accuracy.
4. Demonstrate all of the basic skills required to properly use and maintain hand tools, power tools, and shop equipment including safe and proper usage, preventive maintenance, and proper storage according manual and specification with 80- 89% accuracy.
3. Demonstrate all of the basic skills required to properly use and maintain hand tools, power tools, and shop equipment including safe and proper usage, preventive maintenance, and proper storage according manual and specification with 70- 79% accuracy.
2. Demonstrate all of the basic skills required to properly use and maintain hand tools, power tools, and shop equipment including safe and proper usage, preventive maintenance, and proper storage according manual and specification with 65- 69% accuracy.
1. Demonstrate all of the basic skills required to properly use and maintain hand tools, power tools, and shop equipment including safe and proper usage, preventive maintenance, and proper storage according manual and specification with below 65% accuracy.

COMPETENCY #3 Select, layout, and connect pipes and fittings.

5. Demonstrate all of the basic skills required to properly select, layout and connect pipes and fittings including identification and selection, layout and cutting, connecting preparation and installation according to plan with 90 – 100% accuracy.
4. Demonstrate all of the basic skills required to properly select, layout and connect pipes and fittings including identification and selection, layout and cutting, connecting preparation and installation according to plan with 80 – 89% accuracy.
3. Demonstrate all of the basic skills required to properly select, layout and connect pipes and fittings including identification and selection, layout and cutting, connecting preparation and installation according to plan with 70 – 79% accuracy.
2. Demonstrate all of the basic skills required to properly select, layout and connect pipes and fittings including identification and selection, layout and cutting, connecting preparation and installation according to plan with 65 – 69% accuracy.
1. Demonstrate all of the basic skills required to properly select, layout and connect pipes and fittings including identification and selection, layout and cutting, connecting preparation and installation according to plan with below 65% accuracy.

COMPETENCY #4 Install plumbing fixtures.

5. Demonstrate all of the basic skills required to properly install plumbing fixtures including identification and selection, location layout, preparation and installation, and testing according to plan with 90 – 100% accuracy.
4. Demonstrate all of the basic skills required to properly install plumbing fixtures including identification and selection, location layout, preparation and installation, and testing according to plan with 80 – 89% accuracy.
3. Demonstrate all of the basic skills required to properly install plumbing fixtures including identification and selection, location layout, preparation and installation, and testing according to plan with 70 – 79% accuracy.
2. Demonstrate all of the basic skills required to properly install plumbing fixtures including identification and selection, location layout, preparation and installation, and testing according to plan with 65 – 69% accuracy.
1. Demonstrate all of the basic skills required to properly install plumbing fixtures including identification and selection, location layout, preparation and installation, and testing according to plan with below 65% accuracy.