COURSE OUTLINE

RESIDENTIAL PLUMBING
COURSE TITLE

PL 214
DEPT. & COURSE NO.

I. COURSE DESCRIPTION:

This course covers residential plumbing orientation, plumbing tools and materials, water systems, water valves, faucets and fixtures.

II. SEMESTER CREDITS: 3

III. CONTACT HOURS PER WEEK: 2 LEC | 3 LAB | 5 TOTAL

IV. PREREQUISITE; BP 115 or AD120

V. STUDENT LEARNING OUTCOMES:

Upon completion of the course, the student will be able, with 65% accuracy to:

1, Use plumbing tools appropriately.

2. Demonstrate general safety rules on an habitual basis; apply appropriate safety measures when working under hazardous conditions.

3. Read a rule rapidly and accurately to nearest 1/16 and perform required calculations.

4. Interpret the plumbing symbols and abbreviations used in architectural drawings.

5. Plan the steps involved in bringing water and sewer service into building and Install water and sewer line to a typical residential building.

6. Select and compare different types of faucets, valves, and meters and demonstrate the installation of each device.

7. Select and compare various types of fixtures and install them properly.

8. Illustrate the operation of a simple septic tank system.

VI. COURSE CONTENT:

A. Plumbing Tools

B. Safety

C. Mathematics for Plumbing

D. Print reading and Sketching

E. Pipe & Fitting installation

F. Valves, Faucets, and Meters

G. Plumbing Fixtures

H. Private Waste-Disposal Systems

9.	Assess plumbing problems through the symptoms the system displays.	I.	Symptoms

VII. MATERIALS AND EQUIPMENT:

1. PLUMBING TOOLS
2. DIGITAL PROJECTOR
3. DRAFTING TOOLS
4. SET OF WORKING DRAWING AND SPECIFICATION
5. HANDOUTS
6. TV/COMPUTER AND VCR/DVD

VIII. TEXT AND REFERENCES:

1. TEXT:

   Instructor's made handouts.

IX. METHOD OF INSTRUCTION:

1. LECTURE
2. DISCUSSION
3. DEMONSTRATION
4. LABORATORY WORK
5. FIELD TRIPS (SITE OBSERVATION)

X. METHOD OF EVALUATION:

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

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

1. Participation..... 25%
2. Quizzes/Homework..... 10%
3. MidTerm 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 LIST

RESIDENTIAL PLUMBING Credits: 2 Lecture 1 Lab Total 48 Lab Hrs.

TASKS	HOURS
SLO #1:	**6**
1. Given a selected group of tools, choose the right tool for job and use it properly to complete the assigned task.	
2. Demonstrate how to maintain each common plumbing tool.	
SLO #2	**4**
1. Given various working conditions, select and use the safest approach to complete the task.	
2. Demonstrate proper and safe working habits constantly throughout the duration of the project.	
SLO #3	**4**
1. Apply the formulas for finding area and volume.	
2. Apply S1 metric measure in finding length, area, volume and temperature.	
3. Convert customary measure to metric measure.	
4. Apply and additions, subtractions, and whole numbers.	
5. Given various measuring assignments, choose the right measuring instrument to acquire desired dimension or sizes.	
SLO #4	**4**
1. Scale drawings using either an architects' scale or a rule.	
2. Prepare two-and three-dimension piping sketch.	
3. Apply dimensions of drawings in inches and feet.	
4. Interpret various kinds of plans.	
5. Interprets plumbing Symbols and abbreviations used in architectural drawings.	
SLO #5	**10**
1. Demonstrate methods for testing and inspecting completed plumbing systems.	
2. Apply and use the three methods of measuring pipe length Between fittings.	
3. Apply techniques for working with vitrified clay, cast iron, galvanized and black iron copper, and plastic plumbing materials.	
4. Illustrate the steps involved in bringing water and sewer service into a building.	
5. On a given assignment, install water and sewer line and perform testing for leaks.	

SLO #6 4

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 a and 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 #7 **6**

1. On an assigned project, perform the following:
   a. Demonstrate correct procedure for making water supply and drainage connections for each fixture.
   b. Demonstrate proper installation procedures for each fixture.
2. Given various installation projects, install the proper fixture and test for leaks.

SLO #8 **4**

1. Illustrate methods used in construction of Septic tank and leaching field
2. Illustrate the construction and operation of alternative systems such as the aeration waste treatment system and closed system
3. Illustrate how ground water can be moved away from foundations and basements

SLO #9 **6**

1. Demonstrate an orderly method of checking and testing a plumbing system to confirm an actual problem.
2. Demonstrate procedures for making proper repair when the problem is located.
3. On a given assignment, locate the plumbing problems through the Symptoms System display, and make proper repair to solve the problem.

TOTAL **48**

Palau Community College
PL214 Residential Plumbing
Course Learning Outcomes

During the course experience, the ***course learning outcomes*** (CLO) will be assessed through the use of signature assignments. A rating scale will be used to determine the students' proficiency level of each CLO using specifically aligned assignments. The numerical rating of 4,3,2 and 1 are not intended to represent the traditional school grading system of A, B, C, D and F. The descriptions associated with each of the numbers focus on the level of student performance for each of the course learning outcome listed below.

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

CLO 1: Students will be able to apply personal 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 below 65% accuracy.

CLO 2: Students will be able to use and maintain plumbing tools.

5	Demonstrate ability to perform all the skills required to properly use and maintain plumbing tools including tools selection, proper use and care, and safe storage according to tools specification and within the capacity requirement with 90 – 100% accuracy.
4	Demonstrate ability to perform all the skills required to properly use and maintain plumbing tools including tools selection, proper use and care, and safe storage according to tools specification and within the capacity requirement with 80 – 89% accuracy.
3	Demonstrate ability to perform all the skills required to properly use and maintain plumbing tools including tools selection, proper use and care, and safe storage according to tools specification and within the capacity requirement with 70 –79% accuracy.
2	Demonstrate ability to perform all the skills required to properly use and maintain plumbing tools including tools selection, proper use and care, and safe storage according to tools specification and within the capacity requirement with 65 –69% accuracy.
1	Demonstrate ability to perform all the skills required to properly use and maintain plumbing tools including tools selection, proper use and care, and safe storage according to tools specification and within the capacity requirement with below 65% accuracy.

CLO 3: Students will be able to layout plumbing diagram.

5	Demonstrate all of the skills – plan reading, isometric drawing, schematic drawing, and plumbing line layout; properly layout plumbing diagram according to plan with 90- 100% accuracy.
4	Demonstrate all of the skills – plan reading, isometric drawing, schematic drawing, and plumbing line layout; properly layout plumbing diagram according to plan with 80- 89% accuracy.
3	Demonstrate all of the skills – plan reading, isometric drawing, schematic drawing, and plumbing line layout; properly layout plumbing diagram according to plan with 70- 79% accuracy.
2	Demonstrate all of the skills – plan reading, isometric drawing, schematic drawing, and plumbing line layout; properly layout plumbing diagram according to plan with 65- 69% accuracy.
1	Demonstrate all of the skills – plan reading, isometric drawing, schematic drawing, and plumbing line layout; properly layout plumbing diagram according to plan with below 65% accuracy.

CLO 4: Students will be able to select, layout, and connect pipes and fittings.

5	Demonstrate all of the skills – materials selection, layout plumbing pipes and fittings, determine connecting procedure and preassemble, connect and test – required to properly select, layout, and connect pipes and fittings according to plan with 90- 100% accuracy.
4	Demonstrate all of the skills – materials selection, layout plumbing pipes and fittings, determine connecting procedure and preassemble, connect and test – required to properly select, layout, and connect pipes and fittings according to plan with 80- 89% accuracy.
3	Demonstrate all of the skills – materials selection, layout plumbing pipes and fittings, determine connecting procedure and preassemble, connect and test – required to properly select, layout, and connect pipes and fittings according to plan with 70- 79% accuracy.
2	Demonstrate all of the skills – materials selection, layout plumbing pipes and fittings, determine connecting procedure and preassemble, connect and test – required to properly select, layout, and connect pipes and fittings according to plan with 65- 69% accuracy.
1	Demonstrate all of the skills – materials selection, layout plumbing pipes and fittings, determine connecting procedure and preassemble, connect and test – required to properly select, layout, and connect pipes and fittings according to plan with below 65% accuracy.

CLO 5: Students will be able to install plumbing fixtures.

5	Demonstrate all of the skills – fixture selection, determine installation procedure, pre-installation set-up, install and test – required to properly install plumbing fixtures according to plan with 90 – 100% accuracy.
4	Demonstrate all of the skills – fixture selection, determine installation procedure, pre-installation set-up, install and test – required to properly install plumbing fixtures according to plan with 80 – 89% accuracy.
3	Demonstrate all of the skills – fixture selection, determine installation procedure, pre-installation set-up, install and test – required to properly install plumbing fixtures according to plan with 70 – 79% accuracy.
2	Demonstrate all of the skills – fixture selection, determine installation procedure, pre-installation set-up, install and test – required to properly install plumbing fixtures according to plan with 65 – 69% accuracy.
1	Demonstrate all of the skills – fixture selection, determine installation procedure, pre-installation set-up, install and test – required to properly install plumbing fixtures according to plan with below 65% accuracy.

CLO 6: Students will be able to inspect plumbing system.

5	Demonstrate all of the skills – plan review, layout plan inspection, system layout inspection, leak testing, fixture functional and leak test, and supply and disposal system testing – required to properly inspect and test plumbing system according to plan with 90- 100% accuracy.
4	Demonstrate all of the skills – plan review, layout plan inspection, system layout inspection, leak testing, fixture functional and leak test, and supply and disposal system testing – required to properly inspect and test plumbing system according to plan with 90- 100% accuracy.
3	Demonstrate all of the skills – plan review, layout plan inspection, system layout inspection, leak testing, fixture functional and leak test, and supply and disposal system testing – required to properly inspect and test plumbing system according to plan with 90- 100% accuracy.
2	Demonstrate all of the skills – plan review, layout plan inspection, system layout inspection, leak testing, fixture functional and leak test, and supply and disposal system testing – required to properly inspect and test plumbing system according to plan with 90- 100% accuracy.
1	Demonstrate all of the skills – plan review, layout plan inspection, system layout inspection, leak testing, fixture functional and leak test, and supply and disposal system testing – required to properly inspect and test plumbing system according to plan with 90- 100% accuracy.