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ABSTRACT

The beginning course involves the student with practices in plumbing, referring to the various systems of pipes and tubes that carry liquids and gases from a source to a building. Course content includes goals, specific objectives, orientation, selecting hardware, tools and equipment, prescription for faulty fixtures, and plumbing installations. Solving special problems, major types of piping systems, consumer knowledge, vocational opportunities, and an evaluation also are included. A bibliography and posttest are appended. (NH)

AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

Course Outline

CONSTRUCTION 7-9 PREVOCATIONAL - 5846
(Working as a Plumber)

Department 48 - Quin 5846.09

DADE COUNTY PUBLIC SCHOOLS

DIVISION OF INSTRUCTION • 1973

D A D E C O U N T Y P U B L I C S C H O O L S

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M I A M I, F L O R I D A 33132

Course Outline

CONSTRUCTION 7-9 PREVOCATIONAL - 5846

(Working as a Plumber)

Department 48 - Quin 5846.09

county office of

VOCATIONAL AND ADULT EDUCATION

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Dade County Public Schools
Miami, Florida 33132

September, 1973

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Course Description

5846	48	5846.09	Working As A Plumber
State Category Number	County Dept.	County Course Number	Course Title

This course of study involves the student in the practice of plumbing and will refer to the various systems of pipes and tubes that carry liquids and gasses from a source to a building. The student will participate in activities of installation, servicing, care and maintenance, and safe practices as to local code regulations for plumbing.

Clock Hours: 45

PREFACE

The following course outline has been developed to help the student become proficient in the skills and knowledge necessary to pursue a career as a plumber. This course provides a unit in the development of skills through the actual planning and installation of various systems of pipes and tubes that carry liquids or gasses from a source to a building. Special emphasis is placed on the area of general repairs and maintenance common to the average home.

The course is geared towards enabling the student to be familiar enough with the various hardware, software, and fixtures necessary to make his own home repairs. Upon completion of this course, the student will be able to diagnose common home repair problems, purchase the necessary hardware for repair and finally, perform the repair by himself.

There are no requirements or prerequisites to this course. Knowledge gained in this course will be advantageous to the student who wishes to increase his learning in the field of plumbing and home maintenance. The knowledge gained in this course will also be effective in saving home maintenance costs.

This is a beginning course. The total number of hours of instruction is 45, of which approximately 40 hours are for practical application of knowledge and skills. The outline consists of ten major blocks of instruction, which are subdivided into several units each. Block IX covers an evaluation of the total course experience.

The classroom instruction includes lectures, demonstrations, group discussions, independent study and audiovisual aids, approximately 40 hours are spent on practical application with the student developing proficiency in actual working conditions.

This outline was developed through the cooperative efforts of the instructional and supervisory personnel, the Quinmester Advisory Committee, and the Vocational Curriculum Materials Service, and has been approved by the Dade County Vocational Curriculum Committee.

TABLE OF CONTENTS
with Suggested Hourly Breakdown

GOALS

The student will be able to:

1. Take notation from a teacher prepared lecture, listing the objectives of the course.

2. Demonstrate the ability to diagnose and repair plumbing problems that have been pre-determined by a teacher selected checklist.

3. Demonstrate the ability to select tools and equipment necessary for a specific plumbing repair as determined by the teacher.

4. Select the proper hardware and fixtures necessary to installation of plumbing in newly constructed buildings from a teacher designed inventory.

5. The ability to solve special problems resulting from unexpected conditions through practical application of teacher specified measures.

6. Identify and list in writing specific types of plumbing systems as specified by a teacher prepared lecture.

7. Demonstrate the ability to fill out to 85% accuracy a purchase order of plumbing needs including hardware and software for a newly constructed home.

8. List and define in writing various jobs and opportunities available to the plumber of a selected rank and skill as introduced through guest or teacher lecture, and independent research study.

9. Demonstrate the knowledge and practical experience gained in the total course by performing to a minimum 85% accuracy on a teacher-designed checklist which will be written, oral or performed.

SPECIFIC BLOCK OBJECTIVES

BLOCK I - ORIENTATION

The student must be able to:

1. Demonstrate by displaying his class notebook on the course activities, orientation materials that have passed a teacher evaluation.
2. List and define in writing student responsibilities in the lab as designed by a teacher checklist.
3. Demonstrate his knowledge through teacher-group discussion on the history of plumbing.
4. List and define in writing terms relevant to plumbing as introduced through a teacher checklist.
5. Demonstrate his knowledge of safety, local and state code regulations by discussing their relativity to the lab as stipulated by teacher prepared lecture.

BLOCK II - SELECTING TOOLS AND EQUIPMENT

The student must be able to:

1. Demonstrate the ability to select the appropriate hardware and software in order to accurately complete teacher specified job performances.
2. Demonstrate the ability to select the appropriate tools in order to complete teacher specified job performances.
3. Demonstrate the ability to select appropriate fixtures in order to complete teacher specified job performances.

BLOCK III - PRESCRIPTION FOR FAULTY FIXTURES

The student must be able to:

1. Demonstrate skill in the successful repair of faucets as prescribed by a teacher-prepared checklist.
2. Demonstrate skill in the successful repair of lavatories and toilets as prescribed by a teacher-prepared checklist.
3. Demonstrate skill in the successful repair of clogged drains as prescribed by a teacher-prepared checklist.
4. Demonstrate skill in the successful repair of faulty fixtures as prescribed by a teacher-prepared checklist.
5. Demonstrate skill in the successful repair of leaks in joints and pipes as prescribed by a teacher-prepared checklist.
6. Demonstrate skill in the repair of general plumbing emergencies as prescribed by a teacher-prepared checklist.

BLOCK IV - PLUMBING INSTALLATIONS

The student must be able to:

1. Compare and contrast plumbing systems to pipeline systems as directed by teacher prepared lecture.

BLOCK IV- PLUMBING INSTALLATIONS (continued)

2. Demonstrate the ability to layout the route for piping and to specify pipe sizes from a designed source to a specified structure as determined by a teacher checklist.

3. Demonstrate the ability to match the specified pipe and pipe size to various plumbing fixtures as determined by a teacher-designed checklist.

BLOCK V - SOLVING SPECIAL PROBLEMS

The student must be able to:

1. Recognize and identify problems indigenous to locality, causing problems requiring special attention as described by teacher-designed lecture.
2. Demonstrate methods as prescribed by teacher-designed information/ worksheets to design bypasses for specific obstacle problems inherent to plumbing installations.

BLOCK VI - MAJOR TYPES OF PIPING SYSTEMS

The student must be able to:

1. List in writing the major types of piping systems as discussed in class lectures.
2. Identify in writing the systems of pipelines as to functions and purposes as determined by teacher evaluation.

BLOCK VII - CONSUMER KNOWLEDGE

The student must be able to:

1. Demonstrate his knowledge of the hardware, software and fixtures necessary to the completion of a newly constructed home by writing a list of them.
2. Prepare a layout drawing indicating the routing of utilities from their source to the consumer as indicated by teacher designed sample routing sheets.
3. Complete in writing necessary purchase order for hardware, software and fixtures required to complete the plumbing and piping system for a newly constructed home as designated by a teacher-designed checklist.

BLOCK VIII - VOCATIONAL OPPORTUNITIES

The student must be able to:

1. List and define in writing, various jobs and opportunities available to the student pursuing a career in plumbing as introduced through guest or teacher-prepared lecture and independent research study.
2. List in writing specific methods of vocational preparation necessary to become a licensed plumber as indicated through independent-research study.

BLOCK IX - EVALUATION

The student must be able to:

1. Demonstrate learning behavior changes as determined by a teacher-selected written examination.
2. Determine self progress, given teacher-prepared problems requiring practical and manual application as evidenced by individual solution or correction of the problems.

BLOCK X - QUINMESTER POST-TEST

The student must be able to:

1. Satisfactorily complete the Quinmester Post-Test.

Course Outline

CONSTRUCTION 7-9 PREVOCATIONAL - 5846
(Working as a Plumber)

Department 48 - Quin 5846.09

I. ORIENTATION

A. Objectives of the Course
   1. Standards
   2. Methods of Evaluation
      a. Written test
      b. Diagnosis and job performance
      c. Oral
   3. Teaching methods
      a. Lecture
      b. Demonstration
      c. Discussion

B. Student Responsibilities
   1. Safety regulations
   2. Work regulations

C. History of Plumbing

D. Terminology

E. Code and Safety Regulations
   1. State code
   2. Local code
   3. Classroom code

II. SELECTING HARDWARE, TOOLS AND EQUIPMENT

A. Selecting Appropriate Hardware
   1. Fittings
      a. cast-iron
      b. galvanized
      c. copper
      d. plastic
      e. brass
      f. steel
      g. bronze

B. Tools, Basic Plumbing
   1. Adjustable open end wrench
   2. Pipe wrench
   3. Monkey wrench
   4. Hacksaw
   5. Basin wrench
   6. Fixed spud wrench
   7. Pipe and tubing cutter
   8. Pipe reamer
   9. Socket wrench
   10. Flaring tool
   11. Strap wrench
   12. Chain wrench

II. SELECTING HARDWARE, TOOLS AND EQUIPMENT (continued)

C. Equipment
   1. Soldering
      a. steel wool
      b. flux
      c. solder
      d. torch
   2. Snake - sewer rod
   3. Plunger
   4. Graphite wicking
   5. Washers
   6. Setting compound

III. PRESCRIPTION FOR FAULTY FIXTURES

A. Repairing faucets
   1. Washers
      a. hot
      b. cold

B. Servicing Lavatories and Toilets
   1. Remove waste
   2. Remove and clean trap
   3. Replace flush valve

C. Servicing Clogged Drains
   1. Remove waste or other obstructions
   2. Apply commercial drain cleaners
   3. Plungers
   4. Snake
   5. Remove and clean traps

D. Repairing Fixtures
   1. Toilets
   2. Sinks and faucets
   3. Tubs and faucets
   4. Showers and faucets

E. Repairing Leaks
   1. Faucets
   2. Pipes
   3. Joints

F. Plumbing Emergencies
   1. Leaks
   2. Breaks
   3. Clogs
   4. Over-pressure
   5. Under-pressure

IV. PLUMBING INSTALLATIONS

A. Piping Within a Structure
   1. Plumbing systems
      a. liquid
      b. gas
      c. sewage

B. Installation
   1. Designing
   2. Engineering
      a. routing source
      b. structure layout
   3. Cutting
   4. Assembling
   5. Securing and supporting

C. Piping Specifications
   1. Size
   2. Material
   3. Fixture designation

V. SOLVING SPECIAL PROBLEMS

A. Up-flush toilet
   1. Sewer riser
   2. Gravity drain
   3. Pressure

B. Pressure-Reducing Valve
   1. Improves performance
   2. Aids reduction
      a. leaks
      b. breaks
      c. wastes

VI. MAJOR TYPES OF PIPING SYSTEMS

A. Liquids

B. Gases

C. Sewage

VII. CONSUMER KNOWLEDGE

A. Checklist for Prospective Buyers
   1. Enclosed systems
   2. Exposed pipes
   3. Exposed joints
   4. Discoloration
      a. oxidation
      b. mineralization
      c. corrosion

VII. CONSUMER KNOWLEDGE (continued)

B. Fixture Checklist
   1. Cracks
   2. Breaks

C. Sewage Checklist
   1. Drain time
   2. Odor
      a. Septic tank overflow
      b. Drain cloggage

D. Repair
   1. Needed items
   2. Installation

VIII. VOCATIONAL OPPORTUNITIES

A. Specific Vocations
   1. Engineers
   2. General contractors
   3. Plumbing subcontractors
   4. Steam fitters

B. Employment Requirements
   1. H.S. Vocational course
   2. Trade school experience
   3. Work experience

C. Related fields
   1. Architects
   2. Inspectors
   3. Instructors
   4. Manufacturers
   5. Distributors

IX. EVALUATION

A. Written
   1. Notebook evaluation
   2. Teacher examination
      a. Objective
      b. Subjective

B. Oral
   1. Teacher elicited response
   2. Practical demonstration

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3. Nunn, Richard E. Popular Mechanics Complete Manual of Home Repair and Improvement. New York, New York: Book Division, The Hearst Corporation, 1972, Pp. 480.

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A P P E N D I X

Quinmester Post-Test Sample

7/1

Quinmester Post-Test

Name_____Date_____Score_____

1. Notebook Check

2. Teacher prepared essay - - list and describe the technique of installing fixtures in a newly developed home structure from knowledge gained through the total course.

3. Practical exam by demonstration of specified techniques, example:

   Using the approved course method and the items listed below, select the proper joint connection and repair the broken section of copper tubing within 15 minutes.

   Materials needed:

   Propane torch
   Flux
   Steel wool
   Clean rags
   Solder

ANSWER KEY FOR QUINMESTER POST TEST

1. Based on teacher evaluation.

2. Based on teacher evaluation.

3. Based on Performance Standards as stipulated by Dade County Learning Activity Package.