

**Passaic County Technical Institute**

**CARPENTRY IV**

**JANUARY 2004**

## CARPENTRY IV

### **I. DESCRIPTION**

Carpentry four is a full year course which further sharpens the skills and techniques established by the previous 2 years. Emphasis is placed on preparing the level 4 student for successful completion of the SOCATS test. This test evaluates the student's cumulative skill and knowledge. The SOCAT test is a written and practical test which is a necessary requirement for graduation.

### **II. OBJECTIVES**

1. Safety (9.1; 9.2F)
  - a. Enable student to be informed of various safety organizations
  - b. Use personal protection equipment correctly
  - c. Understand how to organize a safe job site
  - d. Continue review of safety procedure on a daily basis
  - e. Continue to review hand and power tool safety on a daily basis
2. Hand and power tools (9.1; 9.2)
  - a. Refine hand tool techniques
  - b. Refine power tool techniques
  - c. Refine stationary techniques
3. Blue print and specifications (9.1; 9.2)
  - a. Interpret building codes
  - b. Interpret and determine dimensions from multiview drawings
  - c. Interpret specifications and drawing notes
  - d. Identify plot plan/information such as reference points and benchmarks
  - e. Understand common abbreviations and symbols
  - f. Use an architect scale
4. Building materials (9.1; 9.2)
  - a. Identify standard building materials and fasteners
  - b. Estimate, receive and inspect materials
  - c. Store lumber properly
5. Building layout (9.1; 9.2)
  - a. Use builders level and transit for layout and elevators
  - b. Use a laser transit for layout and elevations
  - c. Install batter boards
6. Foundations (9.1; 9.2)
  - a. Construct and align various footing forms
  - b. Construct and align foundation wall forms

- c. Construct and align screeds and forms for concrete flatwork
  - d. Calculate concrete requirements
7. Floor and wall framing (9.1; 9.2)
- a. Identify floor and wall framing components
  - b. Select material
  - c. Frame and install sills, girder, lolly column, joist, floor opening, bridging and sub floor
  - d. Frame and brace wall to include corners, openings, partitions, fixture backing and sheathing
  - e. Frame ceiling with joists, strongbacks and openings
8. Roof framing (9.1; 9.2)
- a. Identify roof types
  - b. Identify roof framing components
  - c. Layout and install ridge board, collar ties, common, hip, valley and jack rafters
  - d. Install roof sheathing
9. Exterior finish (9.1; 9.2)
- a. Install roofing materials
  - b. Install windows and doors
  - c. Install siding and trim
  - d. Install finish rakes and cornice
10. Interior finish (9.1; 9.2)
- a. Install drywall
  - b. Fix and hang interior doors
  - c. Install interior trim
  - d. Install prefabricated cabinets and countertops
11. Stair Construction (9.1; 9.2)
- a. Calculate rise, run and tread width
  - b. Layout, cut and install a straight run stringer
  - c. Cut and install stair treads and risers
  - d. Identify basic stair components

### **III. TEXTBOOKS AND INSTRUCTIONAL MATERIALS**

“Modern Carpentry” by Willis H. Wagner/Howard Smith G.W. Publishing  
copyright 2000 Goodhart-Wilcox Co.

Workbook for Modern Carpentry

Tauton Press Library of Construction Trades videos

Journal of Light Construction Magazine

Fine Home Building Magazine

#### **IV. TEACHING STRATEGIES**

Various teaching techniques will be employed in this course. Intensive instruction will provide the 4th level student with the refined knowledge and skill needed to pass the SOCAT's test. Worksheets, textbook theory and video will supplement the hands-on learning.

#### **V. OUTLINE OF COURSE**

- a. Safety
  1. demonstrate safe work habits
  2. pass general shop safety test 100%
  3. maintain a safe and neat work area
  4. demonstrate safe hand and power tool techniques
  
- b. Hand and Power tools
  1. demonstrate proper hand tool use and procedures
  2. demonstrate proper power tool use and procedures
  3. use hand and power tools and stationary tools to complete various assigned projects
  
- c. Blueprint reading and specifications
  1. understand the purpose of building codes
  2. build various projects from multiview drawings
  3. list various take off specifications and measurements from a set of blue prints
  4. identify and list common abbreviations and symbols
  5. use an architect scale to determine correct measurements/dimensions
  
- d. Building materials
  1. use standard building materials for the correct application
  2. use various fasteners correctly
  3. list lumber inventory correctly
  4. locate building material suppliers using the internet
  5. organize a material list
  6. use estimating skills
  
- e. Building layout
  1. set up a builders level over benchmarks
  2. set up laser level over benchmarks
  3. locate various elevations
  4. use transit to layout building lines
  5. install batter boards
  6. position grade stakes
  7. locate corner stakes

f. Foundation and forms

1. identify various foundation types
2. identify various footing designs
3. locate and align footings
4. identify various anchorages for forms
5. estimate concrete block
6. estimate concrete for flatwork
7. define various foundation terms
8. define various concrete terms
9. clean, organize and store form materials properly

g. Floor and wall framing

1. define and identify wall and floor framing components
2. estimate and select proper materials
3. layout and install sill plates and girders
4. cut and install lally columns
5. layout and install joist headers and floor joists
6. install bridging and sub floor
7. layout and install wall plates
8. layout and install wall openings with headers
9. install fixture backing and drywall nailers
10. cut and install wall bracing
11. plumb walls with level and bracing
12. layout and install ceiling joists and strongbacks
13. cut and install underlayment

h. Roof framing

1. identify roof types
2. identify and define roof components
3. calculate rafters length for cable, hip, gambrel, shed roofs
4. use rafter tables to calculate rafter lengths
5. layout and install ridgeboard
6. layout, install and brace roof trusses
7. install roof purlins
8. install roof sheathing

i. Exterior finish

1. layout and install asphalt roofing
2. install continuous ridge vent
3. install, level, plumb windows
4. install, level, plumb exterior doors
5. identify different types of siding
6. identify various types of windows
7. identify various types of exterior doors
8. define glazing types
9. layout and install cedar shake siding

10. layout and install clapboard siding
11. layout and install vinyl siding
12. identify various types of rake and cornice trim
13. install rake and cornice trim

j. Interior finish

1. identify various types of drywall
2. install drywall
3. identify different types of paneling and trim
4. cut and install casing, baseboard and window stool
5. fit and hand interior doors, plumb square and level
6. layout and install prefabricated cabinets and counters

k. Stair construction

1. identify different types of stair configurations
2. identify various stair components
3. calculate total rise and unit rise
4. calculate total run and unit run
5. determine proper riser height and tread width
6. layout, cut and install a straight run stringer
7. cut and install stair risers and treads
8. calculate handrail height
9. identify types of handrail
10. cut and install handrails
11. cut and install balisters

#### **IV. EVALUATION**

Students are evaluated using the following criteria:

1. Class and shop participation
2. Attendance
3. Periodic written tests and quizzes
4. Periodic practical tests
5. Clean-up and maintenance
6. Keep an organized notebook

## V. PROFICIENCIES

Upon successful completion of the requirements of this course, the student will be able to:

1. Maintain a neat and accurate notebook
2. Work cooperatively and effectively with others.
3. Identify and follow all shop safety procedures
4. Demonstrate accumulated knowledge and skill on tests
5. Apply all learned carpentry skills to various skill projects
6. Demonstrate advanced cabinetmaking skills
7. Demonstrate a thorough understanding of construction blueprints and site plans
8. Understand the basic of field engineering principles including the use of lasers in construction
9. Demonstrate a thorough understanding of all types of interior and exterior finishes
10. Understand the role of supervision in the construction industry including cost estimations
11. Pass the SOCATs satisfactorily

## **STUDENT PROFICIENCIES**

### **CARPENTRY LEVEL IV**

#### **COURSE OVERVIEW**

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

**CARPENTRY IV**  
**SCOPE AND SEQUENCE CHART**

**Suggested Grade Levels**

| <b>SKILL TO BE LEARNED</b>  | <b>9</b> | <b>10</b> | <b>11</b> | <b>12</b>  |
|---|----------|-----------|-----------|------------|
| <b>Understand personal safety</b>   |          |           |           | <b>R</b>   |
| <b>Understand hand and power tool safety</b>  |          |           |           | <b>R</b>   |
| <b>Demonstrate proper hand and power tool techniques</b>                                |          |           |           | <b>R D</b> |
| <b>Understand the purpose of building codes</b>   |          |           |           | <b>D</b>   |
| <b>Apply good blueprint reading skills</b>  |          |           |           | <b>D</b>   |
| <b>Understand the process of building material manufacturing</b>                        |          |           |           | <b>R</b>   |
| <b>Understand site layout and transit use</b>   |          |           |           | <b>D</b>   |
| <b>Understand the methods used for foundations and form work</b>                        |          |           |           | <b>I</b>   |
| <b>Understand the 3 basic floor and wall framing system</b>                             |          |           |           | <b>D</b>   |
| <b>Apply math skills to calculate various carpentry layout problems</b>                 |          |           |           | <b>D</b>   |
| <b>Understand 2 types of roof systems</b>   |          |           |           | <b>R</b>   |
| <b>Apply knowledge and skill to exterior finishes</b>                                   |          |           |           | <b>R</b>   |
| <b>Apply knowledge and skill to interior finishes</b>                                   |          |           |           | <b>R</b>   |
| <b>Apply knowledge and skill to calculate and build a set of straight flight stairs</b> |          |           |           | <b>R</b>   |