

# **Building Trades Course Syllabus**

## **Cedar Rapids Community Schools**

Building Trades is a yearlong class for high school juniors and seniors. The class meets away from the school campus at a construction site. Students in the class learn some of the basic construction skills that are necessary to build a house.

### **Course (open to Juniors and Seniors)**

Building Trades 1 2 Credits

Building Trades 2 2 Credits

The class is sequential and is intended to be started with Building Trades 1. The entire sequence covers two semesters for a total of one school year.

There are no prerequisites, however, courses in construction, woodworking and engineering are very useful and may be a factor in the final selection of students for the program. Students generally must provide their own transportation to the house construction site.

### **Course Description**

In this course students participate in the construction of a full size house on a non-school site. Training and actual construction experiences are offered in most of the major areas of residential construction.

### **Course Objectives**

1. To improve in each student, the ability to recognize and appreciate correct design and quality craftsmanship in the various facets of residential construction.
2. To develop habits of self-reliance, self-discipline, and resourcefulness through dealing with practical problem solving situations, thereby establishing a positive self-image as a successful person.
3. To provide interested students the opportunity to explore the various construction trades through actual hands-on experiences, and thereby develop a desire for further guidance and/or training in a field which is compatible with a given student's interests and aptitudes.
4. To establish through class experiences, a skill and knowledge level sufficient for entry level into the various apprentice programs.
5. To enable the student, through the total class experience, to better make a decision on a practical basis, as to whether or not this is the type of work at which they would be happy and successful.

### **Instructional Delivery**

During the first unit, "Introduction and Safety," the class will be taught in a classroom with a teacher lecture/demonstration format. Upon moving to the house construction site student work teams will be given tasks and will be required to accomplish those tasks "on site". At the construction site the teacher will continue to instruct through lectures, demonstrations, small group instruction and one-on-one instruction.

## **Evaluation System**

Students will be evaluated in three main areas: work quality, work quantity, and attendance.

Work Quality: Is the work the student completes of the proper caliber or nature for their skill and ability level?

Work Quantity: Does the student complete the appropriate amount of work for their skill and ability level?

Attendance: Any day that a student misses is lost as far as what they might have learned or experienced that day. While there is no real way to make-up a missed day it is the student's responsibility to contact the instructor to find out what they missed.

Each of the three areas will have relatively equal weight. However, it should be noted that poor attendance would affect all three of the areas.

## **Attendance Policy**

Attendance in class is of critical importance. New experiences and opportunities take place each and every day. Most cannot be recreated in a make-up situation. Any student with poor attendance habits may be dropped from the class. To remain in the class a student cannot be absent more than eight (8) days during a single term. Each absence counts as one day. Each pre-announced absence (*student must call, text or email the teacher*) counts as only 1/2 of a day. Each unexcused tardy or leaving early also counts as 1/4 of a day. All excused tardies or leaving early are at the discretion of the teacher, and may require a note from a parent or school official. Hospitalization or extended illnesses under a doctor's care will be considered as exceptions to the "five absence rule".

## **Equipment and Tools**

Student provided equipment includes, safety glasses, hardhat, 16oz. claw hammer, tape measure, pencils, tool pouch and work clothing. Each student will be given a credit towards the purchase of their safety glasses and hardhat if the items are ordered through the school district.

All additional hand and power tools plus any other needed equipment will be provided by the school district.

## **Special Accommodations**

Students with disabilities who need any assistance or accommodation should contact the instructor.

## Course Sequence

1. Introduction and Safety
  - a. Class Orientation
  - b. Safety Instruction
  - c. Tool Demonstration
  - d. Preparation for Construction
2. Framing
  - a. Floor framing
    1. Install sill plates
    2. Install floor joists
    3. Install floor decking
  - b. Wall framing
    1. Exterior wall framing
      1. Stud and plate layout and construction
      2. Construct window framing
      3. Construct door framing
      4. Apply wall sheathing
      5. Apply house wrap
    2. Interior framing
      1. Stud and plate layout and construction
      2. Construct door framing
  - c. Roof framing
    1. Install roof trusses
    2. Apply roof sheathing
    3. Apply roof flashings, felt paper and shingles
  - d. Exterior deck framing
    1. Construct footings
    2. Assemble posts, sills and joists
    3. Install floor decking
    4. Install railing and steps
3. Closing the House In
  - a. Windows/doors
    1. Hang entry doors
    2. Install windows
    3. Install overhead door(s)
  - b. Exterior coverings
    1. Install fascia, soffits and gutters
    2. Install siding materials
    3. Install brick or stone work
4. Utility Rough-ins
  - a. Electrical rough-in
    1. Install boxes
    2. Pull wiring
    3. Install phone/data wiring
    4. Install cable TV wiring

- b. Plumbing rough-in
  - 1. Install waste lines
  - 2. Install vent pipes
  - 3. Install supply lines
  - 4. Install gas lines
  - 5. Install passive radon piping
- c. Heating/Cooling/Ventilating rough-ins (HVAC)
  - 1. Install furnace and air conditioner
  - 2. Install supply and return duct work
  - 3. Install ventilation piping or ducts
  - 4. Install pre-fabricated fireplace and vent
- 5. Insulation
  - a. Install attic insulation ventilation chutes
  - b. Install side wall insulation
  - c. Install box sill and other insulation
  - d. Install ceiling insulation
  - e. Apply vapor barriers
- 6. Drywall
  - a. Hang ceiling drywall
  - b. Hang wall drywall
  - c. Tape and mud drywall
  - d. Texture all ceilings and walls
- 7. Finishing
  - a. Painting
    - 1. Paint ceilings
    - 2. Paint walls
  - b. Doors
    - 1. Stain and finish doors
    - 2. Hang doors
    - 3. Install door hardware
  - c. Trim work
    - 1. Stain and finish trim
    - 2. Install door and window trims and casings
    - 3. Install wall baseboards
    - 4. Trim out fireplace surround and mantel
    - 5. Install any miscellaneous trim
  - d. Cabinetry
    - 1. Install bath cabinets
    - 2. Install kitchen cabinets
    - 3. Install miscellaneous cabinets
  - e. Floor coverings
    - 1. Install hard floors (vinyl, wood, tile)
    - 2. Install soft floors (carpet)
  - f. Miscellaneous
    - 1. Install closet shelving
    - 2. Install door stops

3. Apply house number
  4. Install exterior shutters as needed
  5. Install sidewalks and driveway
8. Finals
- a. Electrical finish work
    1. Install switches
    2. Install receptacles
    3. Install lighting fixtures
  - b. Plumbing finish work
    1. Install sinks and toilet fixtures
    2. Install towel bars
  - c. HVAC finish work
    1. Install vent covers
    2. Complete installation of air conditioner and thermostat
9. Landscaping
- a. Prepare finish grading
  - b. Install landscape edging and rock/mulch
  - c. Plant shrubs, trees, etc.
  - d. Install sod

### **General Time Line**

By the end of the first term it is planned that work will be completed through step 4 “Utility Rough-ins”. By end of the second term it is planned that work will be entirely completed through step 9 “Landscaping”.

### **Building Codes**

All construction will conform, at minimum, to the Building Codes of the City of Cedar Rapids as administered by the Cedar Rapids Building Department. Or to the building codes as enforced by the appropriate governing body if the house is built outside of the city of Cedar Rapids.

### **Completion of House**

Upon the completion of the house, at the end of the school year, the house will be marketed by the Cedar Rapids Area Association of REALTORS®. The house will be listed for sale at “market value” and will sold in a similar fashion as any other new construction house.

### **Note**

The site excavation, cement foundation and ground plumbing are typically completed prior to the students reporting to the job site.

Sub-contractors are hired to be in charge of electrical work, plumbing, HVAC, siding, concrete flat work and floor coverings. Students will assist/observe these trades people as time and interest allow.

# Potential Class Instructional Resources

## Reference Books

Wagner, Willis H. Modern Carpentry. South Holland, IL: The Goodheart-Willcox Company, Inc., 1992.

Keller, J.J., ed. Keller's Official OSHA Safety Handbook. 3rd ed. : J.J Keller & Associates, Inc., 1996.

## Videos

Introduction to Construction (17 minutes)

Blue Prints (14 minutes)

Site Preparation (15 minutes)

Black and Decker Power Tool Safety

Basic Carpentry (44 minutes)

Reading A Ruler

Wood Shop Safety (10 minutes)

Ladder Safety (14 minutes)

The Foundation (12 minutes)

Floor & Wall Construction (13 minutes)

“Building for a Green Millennium.” Cedar Rapids Student-built House Eco-house Project. Cedar Rapids Community School District, Cedar Rapids, IA (30 minutes)

"Framing, Layout & Construction." Hometime "How-to" Video. ©1994 Hometime Video Publishing, Inc., Chaska, MN. Video Archive. (60 minutes)

“Weatherization & Insulation.” Hometime "How-to" Video. ©Hometime Video Publishing, Inc., Chaska, MN. Video Archive. (45 minutes)

"Kitchens, Planning & Installation." Hometime "How-to" Video. ©1994 Hometime Video Publishing, Inc., Chaska, MN. Video Archive. (60 minutes)

"Finish Carpentry." Hometime "How-to" Video. ©Hometime Video Publishing, Inc., Chaska, MN. Video Archive.

## **Student Handouts, Unit 1 - Introduction and Safety**

Class Information Sheet  
Map to the House  
Attendance Contract  
Eye Protection  
State of Iowa Construction  
Competencies  
Ruler Handout  
Table Saw Handout  
Drills Handout  
Ladder Safety

Blood Borne Pathogens  
Miter Saw  
Circular Saw  
Hammer Safety Back Safety  
Saber & Reciprocating Saw  
Air Tools  
It's Just Air  
Hearing Safety  
Hand Tools  
Power Actuated Nailer  
Basic 8 Safety Rules