

# ATCT-1320: INTRODUCTION TO HAND AND POWER TOOLS

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## Cuyahoga Community College

**Viewing: ATCT-1320 : Introduction to Hand and Power Tools**

**Board of Trustees:**

May 2025

**Academic Term:**

Fall 2025

**Subject Code**

ATCT - Appld Indus Tech - Carpentry

**Course Number:**

1320

**Title:**

Introduction to Hand and Power Tools

**Catalog Description:**

Study of wood properties, measurement techniques, types and applications of various common fasteners, properties of different woods, identification and use of hand tools, safety considerations, and use of circular portable saw, belt sander, edge sander, router, jigsaw, finish sander, and drill.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

## Requisites

**Prerequisite and Corequisite**

Departmental approval: Admissions to Carpentry Technology apprenticeship program.

## Outcomes

**Course Outcome(s):**

Identify, select, and properly use wood products, fasteners, connectors and hand tools used in the carpentry industry.

**Objective(s):**

1. Describe the properties of different wood products.
2. Identify different wood products.
3. Differentiate between the various fasteners and identify appropriate connectors.
4. Explain appropriate uses for various wood types.
5. Describe types of wood and explain how to differentiate woods.
6. Differentiate between soft and hard woods and identify appropriate carpentry uses for them.
7. Describe a variety of lumber defects using appropriate terminology.

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**Course Outcome(s):**

Operate various hand and power tools to correctly measure, cut, finish and fasten wood, and to properly grind, hone, and maintain tools in accordance with OSHA guidelines.

**Objective(s):**

1. Identify correct uses for a circular portable saw.
2. Demonstrate the proper use of the circular portable saw.
3. Demonstrate ability to grind, hone, and maintain edge cutting tools.
4. Demonstrate proper operation of a belt sander.
5. Identify correct uses for a belt sander.
6. Identify correct uses for an edge sander.
7. Demonstrate proper operation of an edge sander.

8. Identify correct uses of a router.
  9. Demonstrate proper operation of a router.
  10. Identify correct uses of a jigsaw.
  11. Demonstrate proper operation of a jigsaw.
  12. Identify correct uses of a finish sander.
  13. Demonstrate proper operation of a finish sander.
  14. Identify correct uses of a drill.
  15. Demonstrate proper operation of a drill.
  16. Demonstrate proper operation of various types of hammers.
  17. Demonstrate proper operation of various types of chisels.
  18. Demonstrate proper operation of various types of planes.
  19. Demonstrate proper operation of various types of hand saws.
  20. Demonstrate proper operation of a brace and bit.
  21. Demonstrate proper operation of clamps.
  22. Apply OSHA standards, which specifically apply to the use of hand and portable power tools.
  23. Accurately compute board foot measurements.
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#### **Methods of Evaluation:**

1. Quizzes
2. Exams
3. Classroom Participation
4. Completion of assigned projects

#### **Course Content Outline:**

1. Concepts
  - a. Tree growth
  - b. Nature of wood
  - c. Manufacture of wood
    - i. Sawing methods
    - ii. Seasoning
    - iii. Grading
  - d. Lumber defects
    - i. Checks
    - ii. Crooks
    - iii. Bows
    - iv. Twists
    - v. Cups
    - vi. Warping
  - e. Fungi
  - f. Wood preservatives
  - g. Softwood and hardwood grading systems
  - h. Wood panel products
    - i. APA performance-rated panels
    - j. Board footage computations
  - k. Wood fastening systems
    - l. Concrete and masonry fastening systems
  - m. Appropriate uses for various fastening systems
  - n. Appropriate uses for various hand tools
  - o. Safe use procedures for various hand tools
  - p. Types of hand tools
  - q. Hand tool operation techniques
    - i. Hammers
    - ii. Chisels
    - iii. Planes
    - iv. Hand Saws
    - v. Brace and Bit
    - vi. Clamps
  - r. Power tool operation techniques

- i. Portable circular saw
  - ii. Belt sander
  - iii. Edge sander
  - iv. Router
  - v. Jigsaw
  - vi. Finish sander
  - vii. Drill
- s. Appropriate uses for power tools
- t. Lumber measurement
  - i. Nominal size
  - ii. Actual size
- 2. Skills
  - a. Measuring lumber using nominal and actual sizes.
  - b. Computing board footage.
  - c. Fastening systems using nails, staples, screws, hand tools, fasteners for concrete and masonry, and coated abrasives.
  - d. Operating various hammers.
  - e. Operating various chisels.
  - f. Operating various planes.
  - g. Operating various hand saws.
  - h. Operating a brace and bit.
  - i. Operating a clamp.
  - j. Operating a circular saw.
  - k. Operating a belt sander.
  - l. Operating an edge sander.
  - m. Operating a router.
  - n. Operating a jigsaw.
  - o. Operating a finish sander.
  - p. Operating a drill.
- 3. Issues
  - a. Proper use and situation for tools.
  - b. Safe use procedures for tools.

## Resources

Koel, Leonard. *Carpentry*. 7th ed. Homewood: American Technical Publishers, 2021.

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Durbahn, Walter. *Fundamentals of Carpentry*. Chicago: American Technical Publishers (most recent edition), 1977.

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Wagner, Willis, Howard Bud Smith, R. Jack Jones, and Mark W. Huth. *Modern Carpentry*. 13th ed. Tinley Park: Goodheart, 2021.

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## Resources Other

[Carpenter's International Training Fund. https://www.carpenters.org/citf-training/](https://www.carpenters.org/citf-training/) . 2024.

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