

# Residential Wiring Level 1 – Syllabus (High School)

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## INSTRUCTOR / CONTACT

Instructor: \_\_\_\_\_ Room/Shop: \_\_\_\_\_

Email: \_\_\_\_\_ Phone/Ext.: \_\_\_\_\_

School Year/Semester: \_\_\_\_\_

## COURSE OVERVIEW

Residential Wiring Level 1 introduces students to safe work practices, foundational electrical theory, basic tools, and hands-on wiring skills used in single-family dwellings. Emphasis is on safety, tool identification and use, reading simple diagrams, and completing entry-level residential circuits (lighting and receptacle circuits) to industry expectations.

**Safety First:** Students must pass all safety requirements BEFORE working in the shop. A signed safety contract is required from both student and parent/guardian.

## ESSENTIAL SKILLS & LEARNING OUTCOMES

- Demonstrate shop safety, PPE use, and safe behavior in a live lab setting.
- Identify and correctly use basic hand and power tools for residential wiring.
- Explain basic electrical concepts (voltage, current, resistance, power) and Ohm's Law at a Level 1 depth.
- Read and create simple schematics and wiring diagrams (single-pole switch and light, basic receptacle circuits).
- Select and handle common cables and conductors (e.g., NM-B), including stripping, measuring, routing, supporting, and protection.
- Make code-compliant splices and terminations (pigtails, wirenuts, lever connectors; device screw terminations).
- Wire, label, and test basic lighting and receptacle circuits, including GFCI use and basic AFCI awareness.
- Use basic test instruments (receptacle tester, non-contact voltage tester, digital multimeter for continuity/voltage at a beginner level).
- Practice employability skills: teamwork, communication, time management, documentation, and shop cleanup.

**Codes & Standards Awareness:** Students are introduced to NFPA 70 (NEC) concepts as awareness only for Level 1. Local code and instructor direction always apply in the lab.

## UNITS & MAJOR ASSESSMENTS (Sequencing may vary)

### 1. Safety & Orientation

- Lab rules, PPE, safety videos, incident reporting.
- Assessments: Safety contract, safety pre-check.

### 2. Tool Identification & Care

- Hand/power tools, measurement, wire gauge & color coding.
- Assessments: Tool quiz, ID practical.

### 3. Electrical Theory Fundamentals

- Voltage, current, resistance, power; series vs. parallel (concepts).

- Assessments: Exit tickets, mini lab.

#### 4. Schematics, Symbols & Intro to Meters

- Reading/creating simple wiring diagrams; meter safety and basics.
- Assessments: Diagram quiz; meter safety check.

#### 5. Cables, Boxes & Box Fill (awareness)

- NM-B types, box types, basic box fill concept; stripping & preparation.
- Assessments: Lab: prepare cable & set box.

#### 6. Splicing & Terminations

- Pigtails, wirenuts/lever connectors; device screw terminations.
- Assessments: Splice practical using rubric.

#### 7. Lighting Circuits: Single Pole

- Switch loop concepts; neutral in box (awareness); device wiring.
- Assessments: Practical build & test.

#### 8. Receptacle Circuits & Protection

- 15A/20A awareness, line vs. load; GFCI wiring; AFCI awareness.
- Assessments: GFCI practical & polarity check.

#### 9. Rough In Practices (Mock Wall)

- Routing NM, stapling/support, nail plates, labeling & documentation.
- Assessments: Mock wall setup check.

#### 10. Plans, Layout & Residential Symbols

- Room circuit planning & basic takeoffs.
- Assessments: Planning worksheet.

#### 11. Dedicated Circuits Overview

- Kitchens, baths, laundry; basic load/ampacity awareness.
- Assessments: Check for understanding.

#### 12. Testing & Troubleshooting Basics

- Continuity, polarity, open neutral/hot, tripped GFCI/AFCI (awareness).
- Assessments: Troubleshooting practical.

#### 13. Low Voltage Introduction

- Doorbell/thermostat/data handling & safety.
- Assessments: Mini project.

#### 14. Capstone Project (Non Lamp)

- Options: Mock room rough in with lighting & receptacle circuits OR a code aware branch circuit board. Plan, budget, build, peer review, documentation.
- Assessments: Project plan/materials list; rubric checkpoints.

#### 15. Review, Employability & Shop Organization

- Professional behaviors, cleanup systems, resume tips.
- Assessments: Review packet; employability rubric.

## 16. Final Assessments & Showcase

- Final written & practical; project showcase; reflection.
- Assessments: Final exams; reflection sheet.

### ASSESSMENT & GRADING

- Lab/Projects – 40%
- Knowledge Checks – 25%
- Safety – 15%
- Employability/Professionalism – 10%
- Notebook/Documentation – 10%

Safety Gate: Students must score 100% on the safety test and pass a PPE/tool demonstration before performing independent lab work. Retakes allowed after review.

### MATERIALS & PPE (Student Provides When Possible)

- ANSI Z87.1 safety glasses (kept in class)
- Closed toe, hard soled shoes/boots; long pants (no shorts)
- Hair secured; no dangling jewelry or loose clothing
- 1" binder with dividers, pencils, fine tip marker
- Tape measure (25 ft), basic gloves (optional per task)
- School issued devices as allowed by instructor

Program provides shared tools and consumables; students are responsible for using and returning tools correctly.

### SHOP SAFETY RULES (Highlights)

- 1) PPE on, power off: wear eye protection at all times; deenergize before work.
- 2) No live work in this course; follow lockout/tagout procedures as instructed.
- 3) Inspect tools and cords before use; report damage immediately.
- 4) No horseplay; keep aisles clear; maintain clean work areas.
- 5) One hand rule near energized panels during demos; respect boundaries.
- 6) Use proper connectors and terminations; follow strip lengths and torque guidance.
- 7) Ask before you act if unsure. Safety violations may remove lab privileges.

### DAILY ROUTINES

- Bell Ringer (3–5 min): safety/tool question or diagram prompt.
- Mini lesson/Model (10–20 min) → Guided Practice (15–25 min) → Lab/Build (30–45 min).
- Cleanup (last 8–10 min): tools returned, benches swept, trash emptied, floors clear.
- Exit Ticket: quick reflection or check for understanding.

### ATTENDANCE, MAKEUP, AND LATE WORK

Labs are hard to replicate at home. Makeup labs occur during designated times per school policy.

Late work: accepted per school policy with communicated deadlines; labs may require alternative written tasks if shop time isn't available.

Absences: students check LMS/board for missed notes and schedule makeups within 1 week.

### DEVICE POLICY

Personal devices are stored away during instruction and lab unless specifically approved for documentation or LMS tasks.

### ACADEMIC INTEGRITY & PROFESSIONALISM

Submit your own work, credit sources, and behave like a professional in a real shop. Cheating, unsafe behavior, or vandalism may result in disciplinary action and loss of lab privileges.

### ACCOMMODATIONS & SUPPORT

Accommodations per IEP/504 plans will be honored. Please communicate needs early.

### COMMUNICATION

Class updates, due dates, and resources posted on: \_\_\_\_\_ (LMS/Google Classroom).

Best time to reach me: \_\_\_\_\_. Parent/guardian conferences by appointment.

### PARENT/GUARDIAN & STUDENT ACKNOWLEDGMENT

I have read and understand the syllabus and safety expectations.

Student (print): \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Parent/Guardian (print): \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_ Emergency Contact & Phone: \_\_\_\_\_

### OPTIONAL ADDENDA (Separate Handouts)

- Safety Contract (sign & return)
- Tool Identification Sheet
- Shop Cleanup Roles & Checklist
- Capstone Project Rubric (for selected capstone)
- Midterm/Final Practical Rubrics