



COURSE 962911

Residential Rehab - Ch 5 Electrical

Exam Material

Uscontractorlicense LLC

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Summary Of This Course

RESIDENTIAL REHABILITATION - CHAPTER 5 ELECTRICAL

Approved by the

Wisconsin Department of Safety and Professional Services Safety and Buildings Division

Course Identification Number 962911

Educational Credit Hours: 4 Hours

Course Provider:

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Chapter 5 of Residential Rehab explains how to inspect and evaluate residential electrical systems to determine whether they are safe, functional, and capable of meeting current and future electrical demands. It begins with an overview of the electrical system, emphasizing the importance of assessing older systems and having qualified electricians perform detailed evaluations. The chapter covers inspection of the service entry, including overhead conductors, electric meters, service entrance conductors, and service capacity. It then discusses the main panelboard, focusing on proper location, grounding, amperage and voltage ratings, overcurrent protection, and recognizing signs of overload or unsafe modifications. The final section examines branch circuits, wiring methods, grounding, GFCI protection, and acceptable wiring types such as NM, UF, AC, MC, and EMT. Special attention is given to older knob-and-tube wiring and aluminum wiring, identifying hazards, deterioration, and proper corrective measures. The chapter concludes by stressing safe installation practices, proper testing procedures, and the importance of functioning smoke detectors for occupant safety.

This Course is approved for the following electrical Registrations/Certifications or Licenses:

UDC Electrical Inspector	4 Hours of Continuing Education	
Commercial Electrical Inspector	4 Hours of Continuing Education	
Registered Electrician	4 Hours of Continuing Education	
Journeyman Electrician	4 Hours of Continuing Education	
Industrial Journeyman Electrician	4 Hours of Continuing Education	
Master Electrician	4 Hours of Continuing Education	
Residential Master Electrician	4 Hours of Continuing Education	
Residential Journeyman Electrician	4 Hours of Continuing Education	

This course is a distance learning or e-learning course, which allows the attendee to complete the course on their time schedule.

Course Outline

This course is a distance learning or e-learning course, which allows the attendee to complete the course on their time schedule.

Chapter 5 Electrical System

5.1 Service Entry

5.2 Main Panelboard (Service Equipment)

5.3 Branch Circuits

Exam

120 questions related to the reference materials are used to test the attendee on their comprehension of the materials. A 70% score will need to be attained in order to pass this course.

Answer Sheet(s)

1 bubble style answer sheets are included. When you are finished with the exam, you may return the answer sheets for grading to:

By Mail: Uscontractorlicense LLC
PO Box 268
Platteville, Wisconsin 53818

By Email: michael@uscontractorlicense.com
By Fax: 608-571-0096

Once we get the answer sheets back, we will grade them, enter your hours into the attendance portal and email or mail you back your certificate of completion(s). You will be responsible for renewing your license with the DSPS at www.license.wi.gov website.

Any questions, please contact us at 608.348.6688

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Residential Rehab - Chapter 5

Electrical Systems

Questions 1 thru 8 can be found in the Introduction

1. What are the three primary components of a residential electrical system?

- A. Meter, transformer, receptacles
- B. Service entry, panelboard, and branch circuits
- C. Fuse box, switches, and lighting
- D. Conduit, outlets, and breakers

2. Homes built after approximately 1940 generally have electrical systems that are:

- A. Unsafe and unusable
- B. Completely obsolete
- C. Intact and generally safe but may lack capacity for modern loads
- D. Required to be replaced

3. Electrical capacity in many homes can be increased by:

- A. Replacing all branch wiring
- B. Installing more outlets
- C. Adding additional service capacity and a larger panelboard
- D. Increasing breaker sizes only

4. Electrical systems in homes built before about 1940 may require:

- A. No inspection
- B. Automatic replacement
- C. Overhaul or replacement depending on condition and rehabilitation plans
- D. Only new outlets

5. Who should perform the assessment of an existing electrical system?

- A. Homeowner
- B. Building inspector
- C. General contractor
- D. Qualified residential electrician

6. Universal design recommendations for electrical devices are found in:

- A. NEC Article 310
- B. Wisconsin SPS Code
- C. HUD Residential Remodeling and Universal Design publication
- D. OSHA Handbook

7. Existing electrical service capacity should be assessed using:

- A. NEC Article 430
- B. Table 250
- C. Figure 5.1
- D. Figure 3.2

8. Safety standards for Chapter 5 inspection procedures are generally based upon:

- A. OSHA Regulations
- B. International Building Code
- C. NFPA 101
- D. National Electrical Code (NEC)

Questions 9 thru 30 can be found in Section 5.1 - Service Entry

9. Overhead service wires should be at least:

- A. 8 feet above ground
- B. 9 feet above ground
- C. 10 feet above ground
- D. 12 feet above ground

10. Overhead service conductors should NOT:

- A. Enter a weatherhead
- B. Have drip loops
- C. Be insulated
- D. Contact tree branches

11. Service conductors should be attached to the building using:

- A. Metal straps
- B. Plastic clips
- C. Wire ties
- D. Insulated anchors

12. What should be provided where conductors enter the weatherhead?

- A. Fuse links
- B. Ground rods
- C. Drip loops
- D. Junction boxes

13. Service entrance splices should be:

- A. Wrapped with tape only
- B. Left exposed
- C. Painted
- D. Well wrapped

14. Bare service entrance wires from the utility should be:

- A. Painted
- B. Covered with insulation
- C. Left alone
- D. Replaced by the utility company

15. Overhead service conductors should never be located over:

- A. Sidewalks
- B. Driveways
- C. Decks
- D. Swimming pools

16. The electric meter and meter base should be:

- A. Painted yearly
- B. Underground
- C. Plastic only
- D. Weatherproof

17. Inspectors should verify that the electric meter:

- A. Is warm
- B. Is oversized
- C. Has not been tampered with
- D. Is locked

18. Problems with the electric meter should be reported to:

- A. Building owner
- B. Electrician
- C. Fire department
- D. Utility company

19. In seismic zones inspectors should look for:

- A. Larger conduit
- B. More outlets
- C. Flexible electrical connections
- D. Aluminum wire

20. Service entrance conductors should have:

- A. Three splices
- B. Junction boxes
- C. Extension cords
- D. No splices

21. The insulation on the service entrance conductor should be:

- A. Painted
- B. Flexible only
- C. Partially intact
- D. Completely intact

22. Where the service conductor enters the building wall, the opening should be:

- A. Left open
- B. Screened
- C. Vented
- D. Sealed against moisture

23. Aluminum service conductor terminations should be treated with:

- A. Grease
- B. Silicone
- C. Paint
- D. Oxide inhibitor

24. When replacing an overhead service entry, the preferred replacement is:

- A. Larger overhead wires
- B. Copper overhead wire
- C. Surface raceway
- D. Underground service entry

25. Why should inspectors verify the type of power supplied by the utility?

- A. Every utility provides DC current
- B. Every building has identical service
- C. To determine appliance size only
- D. Different jurisdictions may supply different electrical systems

26. Electrical service capacity is measured in:

- A. Volts
- B. Ohms
- C. Watts
- D. Amperes (amps)

27. One method of determining service conductor ampacity is by checking:

- A. House plans
- B. Utility bill
- C. Paint color
- D. Conductor markings

28. If service conductors have no markings they should be evaluated by:

- A. Homeowner
- B. Realtor
- C. Inspector
- D. Qualified electrician

29. The building's service capacity is determined by:

- A. Largest breaker
- B. Average breaker size
- C. Number of circuits
- D. The lowest of the three ampacity ratings

30. If the estimated electrical demand after rehabilitation exceeds the existing service capacity:

- A. Nothing must be done
- B. Install larger breakers
- C. Remove circuits
- D. Upgrade the electrical service

Questions 31 thru 66 can be found in Section 5.2 Main Panelboard (Service Equipment)

31. The main panelboard serves as the:

- A. Utility transformer
- B. Grounding electrode
- C. Meter enclosure
- D. Distribution center for electrical service

32. The main panelboard protects house wiring from:

- A. Moisture
- B. Rodents
- C. Lightning
- D. Overloads

33. Water stains or rust on an indoor panelboard may indicate:

- A. Termite damage
- B. Overheating
- C. Foundation settlement
- D. Water infiltration along the service entrance conductor

34. Outdoor panelboards should be:

- A. Vented
- B. Painted annually
- C. Grounded only
- D. Watertight and tamper-proof

35. Indoor panelboards should be located:

- A. In the attic
- B. Near the kitchen
- C. Near the furnace
- D. As close as possible to the service entrance conductor

36. A panelboard should always have:

- A. A lock only
- B. A cooling fan
- C. Extra breakers
- D. A secure, workable cover

37. The amperage rating of the main disconnect should never exceed:

- A. Branch circuit rating
- B. Appliance load
- C. Utility transformer rating
- D. The service entrance conductor or panelboard rating

38. A main disconnect rated higher than the service conductors creates:

- A. Better efficiency
- B. Lower voltage
- C. Easier maintenance
- D. A serious safety hazard

39. The voltage rating of the panelboard should match:

- A. The largest appliance
- B. The branch circuits
- C. The service disconnect
- D. The incoming electrical service voltage

40. The panelboard voltage rating is found on the:

- A. Breaker handle
- B. Cover plate
- C. Grounding conductor
- D. Manufacturer's data plate

41. The actual incoming service voltage should be checked with a:

- A. Clamp meter
- B. Megger
- C. Ammeter
- D. Voltmeter

42. Voltage testing should generally be performed by:

- A. Homeowner
- B. Apprentice
- C. Building owner
- D. Qualified electrician

43. Three service conductors usually indicate:

- A. 120 volts only
- B. 208 volts
- C. 277 volts
- D. 120/240 volts

44. Two service conductors usually indicate:

- A. 240 volts
- B. 208 volts
- C. 480 volts
- D. 120 volts

45. The panelboard grounding conductor should connect to:

- A. Gas piping
- B. Heating ducts
- C. Sewer piping
- D. An approved grounding electrode or metal water service pipe

46. If the grounding conductor is attached on the house side of the water meter:

- A. Replace the meter
- B. Remove the conductor
- C. Install a larger conductor
- D. The water meter should be jumpered

47. A grounding conductor should NEVER be attached to:

- A. Ground rod
- B. Metal water pipe
- C. Approved grounding electrode
- D. A natural gas pipe

48. Older homes grounded only to a cold-water pipe may require:

- A. Smaller conductors
- B. New breakers
- C. Fuse replacement
- D. An alternate grounding method to meet current code

49. Resistance-to-ground testing is performed using:

- A. Voltmeter
- B. Clamp meter
- C. Circuit analyzer
- D. Ohmmeter

50. A resistance-to-ground test should be performed by:

- A. Homeowner
- B. Apprentice
- C. Property manager
- D. Qualified electrician

51. The overcurrent device protecting #14 copper wire is normally:

- A. 10 amps
- B. 20 amps
- C. 30 amps
- D. 15 amps

52. The overcurrent device protecting #12 copper wire is normally:

- A. 15 amps
- B. 25 amps
- C. 30 amps
- D. 20 amps

53. Electric water heaters commonly require:

- A. 15 amps
- B. 20 amps
- C. 25 amps
- D. 30 amps

54. Electric ranges commonly require:

- A. 20 amps
- B. 30 amps
- C. 35 amps
- D. 40 or 50 amps

55. Aluminum conductors should generally be:

- A. One size smaller than copper
- B. The same size as copper
- C. Used for every branch circuit
- D. One size larger than equivalent copper conductors

56. Aluminum conductors should NOT be used for:

- A. Service entrance conductors
- B. Feeders
- C. Large appliance circuits
- D. 15- and 20-amp branch circuits

57. A breaker larger than the conductor rating may result in:

- A. Lower utility bills
- B. Improved appliance performance
- C. Better voltage regulation
- D. Overheating and fire hazards

58. Numerous blown fuses or breakers taped in the ON position usually indicate:

- A. Correct installation
- B. Low electrical demand
- C. Excellent maintenance
- D. Frequent overloads and inadequate electrical service

59. Burned insulation, melted insulation, warm breakers, or discolored fuse contacts are signs of:

- A. Proper operation
- B. Moisture only
- C. Low voltage
- D. Electrical overloading

60. Circuit breakers should be manually operated during inspection to verify:

- A. Paint color
- B. Labeling
- C. Voltage rating
- D. Proper operating condition

61. A commercially available circuit breaker tester simulates:

- A. Low voltage
- B. Ground faults only
- C. Open neutrals
- D. An overload condition

62. Circuit breaker overload testing should generally be performed by:

- A. Homeowner
- B. Maintenance staff
- C. Building owner
- D. Qualified electrician

63. Supplementary overcurrent devices should be located in:

- A. Wooden cabinets
- B. Plastic containers
- C. Cardboard boxes
- D. Metal boxes

64. Supplementary overcurrent devices should NOT be located near:

- A. Plumbing fixtures
- B. Concrete walls
- C. Windows
- D. Easily ignitable materials

65. All panelboards should have:

- A. Cooling fans
- B. Locks only
- C. Vent openings
- D. Protective covers

66. Electrical power to a dwelling should be capable of being shut off:

- A. At each receptacle
- B. At every room
- C. At the utility pole
- D. From a single location

Questions 67 thru 120 can be found in Section 5.3 Branch Circuits

67. The oldest residential wiring systems included:

- A. Romex only
- B. EMT conduit only
- C. MC cable only
- D. Open wires on metal cleats, wiring in plaster, and wooden molding

68. The oldest wiring system still commonly found in houses built before 1930 is:

- A. NM cable
- B. BX cable
- C. EMT conduit
- D. Knob-and-tube wiring

69. Knob-and-tube wiring uses porcelain knobs to:

- A. Protect switches
- B. Hold breakers
- C. Ground receptacles
- D. Support conductors through open spaces

70. Porcelain tubes in knob-and-tube wiring are used when wires pass through:

- A. Chimneys
- B. Foundations
- C. Roof shingles
- D. Studs and joists

71. Knob-and-tube wiring splices should be:

- A. Wire-nutted only
- B. Crimped only
- C. Wrapped only
- D. Mechanically twisted, soldered, and taped

72. During rehabilitation, knob-and-tube wiring generally should be:

- A. Painted
- B. Hidden
- C. Left untouched
- D. Replaced

73. Properly installed knob-and-tube wiring may still be acceptable if it:

- A. Is overloaded
- B. Has damaged insulation
- C. Lacks grounding
- D. Is in good condition and meets local requirements

74. One major concern with knob-and-tube wiring is:

- A. Oversized conductors
- B. Excessive grounding
- C. Water intrusion
- D. Brittle insulation that deteriorates with age

75. If failed insulation is found on accessible knob-and-tube wiring:

- A. Tape it temporarily
- B. Increase breaker size
- C. Ignore concealed wiring
- D. Replace the wiring

76. NM cable is commonly known by the trade name:

- A. BX
- B. EMT
- C. MC
- D. Romex

77. NM cable is intended primarily for:

- A. Underground locations
- B. Wet locations
- C. Exterior burial
- D. Dry locations

78. NMC cable differs from NM because it is rated for:

- A. Higher voltage
- B. Underground use
- C. Industrial use
- D. Damp locations

79. UF cable is designed for:

- A. Indoor ceilings only
- B. Attics only
- C. Dry walls
- D. Underground and waterproof applications

80. AC cable is also known as:

- A. Romex
- B. Thinwall
- C. MC
- D. BX

81. MC cable contains:

- A. A bare grounding conductor only
- B. No grounding conductor
- C. A copper water line
- D. A green insulated grounding conductor

82. EMT is commonly referred to as:

- A. BX
- B. Romex
- C. Greenfield
- D. Thinwall

83. EMT is generally used where:

- A. Minimum protection is needed
- B. Temporary wiring is installed
- C. Flexible cords are required
- D. Maximum protection is required

84. The function of each branch circuit should be:

- A. Memorized by the owner
- B. Written on the wall
- C. Left unidentified
- D. Clearly and legibly marked at the disconnect or panel directory

85. Branch circuit connected loads should:

- A. Exceed conductor ratings
- B. Match appliance color
- C. Use the largest breaker available
- D. Not exceed the circuit rating

86. A 30-amp clothes dryer connected to a 20-amp circuit is an example of:

- A. Correct installation
- B. Proper sizing
- C. NEC compliance
- D. An overloaded branch circuit

87. A typical dwelling should have approximately how many 15-amp lighting and convenience outlet circuits?

- A. One
- B. Five to six
- C. Eight to ten
- D. Two to four

88. Kitchen, dining, and laundry appliance circuits are typically:

- A. One 15-amp circuit
- B. One 30-amp circuit
- C. Four 15-amp circuits
- D. Two 20-amp circuits

89. Large appliances such as ranges and water heaters should generally have:

- A. Shared lighting circuits
- B. Extension cords
- C. 15-amp convenience circuits
- D. Separate circuits of appropriate ampacity

90. Buildings constructed before 1980 may have too few circuits because modern codes require:

- A. Separate garage and attic circuits only
- B. Three lighting circuits per room
- C. One breaker for every outlet
- D. Dedicated laundry and bathroom receptacle circuits

91. Excessive voltage drop in a branch circuit may be caused by:

- A. Oversized conduit
- B. Low humidity
- C. New receptacles
- D. Excessive circuit length, poor connections, or undersized wire

92. Voltage drop measurements should be taken:

- A. With the breaker off
- B. Without any connected load
- C. At the electric meter only
- D. While the circuit is under load

93. Voltage drop testing should generally be performed by:

- A. Homeowner
- B. Building owner
- C. Property manager
- D. Qualified electrician

94. Although older homes may not require it, the preferred practice is for all branch circuits to be:

- A. Aluminum
- B. Fused
- C. Surface mounted
- D. Grounded to the panelboard

95. Metal-clad cable should never be assumed to be:

- A. Properly sized
- B. Copper
- C. New
- D. Properly grounded without testing

96. Three-prong receptacles should:

- A. Automatically be considered grounded
- B. Never be tested
- C. Be replaced immediately
- D. Be checked for an actual connected grounding conductor

97. Ground-fault interrupter (GFI/GFCI) receptacles should be installed in:

- A. Bedrooms only
- B. Living rooms only
- C. Closets only
- D. Laundry rooms, kitchens, and bathrooms

98. According to the guide, GFI receptacles were generally not required before:

- A. 1965
- B. 1975
- C. 1985
- D. 1990

99. Commercial circuit analyzers can detect:

- A. Water leaks
- B. Gas leaks
- C. Insulation thickness
- D. Open grounds, open neutrals, and reversed wiring

100. During inspection, conductors should be checked for:

- A. Paint color
- B. Manufacturer logos
- C. Decorative covers
- D. Exposure to physical damage or abrasion

101. Wire insulation should be inspected for:

- A. Manufacturer labels
- B. Date codes
- C. Color only
- D. Fraying or physical damage

102. Electrical wire splices should be made:

- A. Behind drywall
- B. Inside insulation
- C. Above ceiling tiles
- D. Inside approved work boxes

103. Junction boxes and switch boxes should have:

- A. Vent openings
- B. Paint
- C. Weather stripping
- D. Cover plates

104. Exterior receptacles should be:

- A. Standard indoor type
- B. Ungrounded
- C. Aluminum only
- D. Weatherproof

105. A megohm insulation test requires:

- A. Clamp meter
- B. Ammeter
- C. Voltmeter
- D. Megger tester

106. Before performing a megohm test, electrical service should be:

- A. Increased
- B. Grounded
- C. Energized
- D. Disconnected

107. With no connected loads, branch circuits should read at least:

- A. 100,000 ohms
- B. 250,000 ohms
- C. 500,000 ohms
- D. 1 megohm to ground

108. With lights or appliances connected, branch circuits should read at least:

- A. 100,000 ohms
- B. 250,000 ohms
- C. 500,000 ohms
- D. 2 megohms

109. A visual inspection of accessible insulation is often sufficient to determine whether:

- A. New lighting is needed
- B. Service voltage is correct
- C. Panel replacement is required
- D. Additional testing by an electrician is warranted

110. Unprotected wiring should NOT be routed through:

- A. Stud bays
- B. Conduit
- C. Junction boxes
- D. Ducts or other inappropriate areas

111. Evidence of "handyman tampering" may include:

- A. Factory-installed connectors
- B. New panel directories
- C. Approved conduit fittings
- D. Unconventional wire splices

112. Surface-mounted lamp cord extension wiring is considered:

- A. Acceptable permanently
- B. Preferred for renovations
- C. Acceptable in unfinished basements
- D. Dangerous and should be removed

113. Unused or abandoned wiring should:

- A. Be painted
- B. Be left energized
- C. Be hidden in walls
- D. Be removed whenever possible

114. Residential aluminum branch-circuit wiring was used primarily during the:

- A. 1940s-1950s
- B. 1950s-1960s
- C. 1980s-1990s
- D. 1960s and early 1970s

115. Aluminum conductors should be connected only to devices marked:

- A. CU
- B. AL
- C. CU-ONLY
- D. CO-ALR or ICU-AL

116. Problems with aluminum wiring most commonly occur at:

- A. Conduit bends
- B. Service drops
- C. Ground rods
- D. Electrical connections

117. Which condition may indicate aluminum wiring problems?

- A. Cold cover plates
- B. Quiet switches
- C. Clean receptacles
- D. Warm cover plates, arcing, flickering lights, or a distinctive odor

118. Aluminum wire connections should contain:

- A. Electrical tape only
- B. Silicone sealant
- C. Pipe dope
- D. Oxide inhibitor

119. Whenever practical, aluminum wiring should be replaced with:

- A. Larger aluminum conductors
- B. Steel conductors
- C. Fiber-optic cable
- D. Copper wiring and devices approved for copper

120. Buildings should have functioning smoke detectors that are:

- A. Battery-powered only
- B. Plug-in only
- C. Connected only to the security system
- D. Wired to a power source and equipped with battery backup

