

Iowa Electrical Examining Board

**Post-Secondary Electrical Program
for
Residential Electricians
Approval Policy**

November 29, 2012

Residential Electrician Technical College Program Approval

1. THE POST-SECONDARY ELECTRICAL PROGRAM APPROVAL PROCESS

Iowa Code Section 103.12A provides authority to the Iowa Electrical Examining Board to set the qualifications for a Residential Electrician License. Under that statutory authority, the Board promulgated Iowa Administrative Rule 661-505.101, which establishes procedures for program approval of post-secondary education programs that meet the required qualifications for licensure of students in the program. This Policy sets out the specific requirements for approval of programs that provide educational experience requirements to qualify for Board sponsored testing for a State of Iowa Residential Electrician license.

2. POST-SECONDARY ELECTRICAL PROGRAM – RESIDENTIAL ELECTRICIAN

The State of Iowa Electrical Examining Board requires that a qualifying Post-Secondary education program must award a diploma or an associate of applied science degree at completion. If a diploma is awarded, it shall specify that it is for a Residential Electrician.

3. POST-SECONDARY ELECTRICAL PROGRAM HOURS – RESIDENTIAL ELECTRICIAN

The Iowa Electrical Examining Board has the authority to sponsor a student who has successfully completed an approved Post-Secondary program and On the Job Training (OJT) requirement to test for the Residential Electrician license in the State of Iowa.

A. A total of 5000 hours must be completed, including class hours in an approved post-secondary electrical programs and “On the Job Training” performed after the completion of a post-secondary electrical program. All of the hours, including the classroom hours, must be from a source approved by the Electrical Examining Board.

1) The student is required to complete 1000 hours of instruction, from an approved post-secondary electrical program.

2) The student is required to perform 4000 hours of OJT while licensed as an unclassified person, to be supervised by an approved Electrician who is licensed in Iowa. The OJT must also be recorded and documented, as outlined in this document; and must be of the categories listed in this document (13A thru 13B).

B. After completing the required 5000 hours (an Approved Post-Secondary Electrical Program of 1000 hours, and 4000 hours of documented OJT) a student is eligible to be sponsored by the Iowa Electrical Examining Board to sit for the Residential electrician exam, at the student’s expense.

4. APPLICATION FOR PROGRAM APPROVAL – RESIDENTIAL ELECTRICIAN

A. CONTENT:

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An application for approval of a program must meet each of the requirements.

- 1) The application must be in a format provided by the board and contain complete, current and accurate information. The application must specify that the program results in a Residential Electrician degree or a diploma that shall specify that it is for a Residential Electrician.
- 2) The application must include a syllabus for each program course.
- 3) The application must include a detailed written description of how the program meets the required program content.
- 4) The application must identify course instructors and their qualifications.
- 5) The application must identify a beginning date corresponding to an initial student enrollment date. Students enrolled after the beginning date who successfully complete an approved program within the approval period are eligible for OJT credit.
- 6) The application must be signed by the administrator and department head, or another official representative of the program.

B. PROCESSING:

The Electrical Examining Board's Education Subcommittee shall review all applications. Items 1 to 5 apply to all applications.

- 1) Incomplete applications must be immediately returned to the applicant.
- 2) Upon review of completed applications, including completion of a survey, any deficiencies must be noted and identified to the applicant.
- 3) If no deficiencies are noted or all identified deficiencies have been corrected, the committee shall recommend approval to the full board.
- 4) If the applicant fails to correct identified deficiencies, the Education sub-committee shall recommend disapproval to the full Board and notify the applicant of the disapproval.
- 5) An applicant may request a hearing before the full Board to appeal disapproval of a program

C. REPORTING AND RE-APPLYING FOR APPROVAL:

- 1) By July 1 of each year, the administrator of a program shall produce an annual report, which shall be accessible to the Board upon request. The annual report must include a copy of course syllabi for approved programs, a detailed description of new courses or courses modified, and identification and qualifications of instructors, including instructor development.
- 2) The report must be signed by the administrator and department head or another official representative of the program provider.

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- 3) An approved program must be resubmitted for approval as required by the Board. Regular program reviews are scheduled to occur every 5 years, but the Board may set other times for program reviews and must give notice to the program of the time for review. Programs may be required to submit documentation of their compliance with Board requirements at least 6 months before a scheduled review.
- 4) The administrator of an approved program shall notify the Board when an approved program is discontinued or modified. Notification shall be made to the Board within 30 days of the decision to discontinue or modify.

D. EFFECTIVE DATE – RESIDENTIAL ELECTRICIAN

Programs seeking approval must submit an application at least 60 days before an approved Residential Electrician program can go into effect.

5. WITHDRAWAL OF PROGRAM APPROVAL – RESIDENTIAL ELECTRICIAN

- A. The Board has authority to withdraw approval of a program when it determines that the program does not satisfy statutorily established minimum requirements as set by the Board in its Rules or accompanying policy.
- B. The Board may withdraw approval of a program if the administrator of an approved program fails to produce the annual report when requested by the Board.
- C. The Board may withdraw approval of a program if the administrator of an approved program fails to resubmit the program for review within 6 months before a scheduled review.
- D. The Board may withdraw approval of a program if the program is modified and such modification results in a failure to meet program requirements set by the Board.

6. VERIFICATION OF COMPLETION – RESIDENTIAL ELECTRICIAN

Upon inquiry by the Board, the provider of an approved program shall provide verification that an applicant has completed an approved program. The verification shall specify that the program is for a Residential Electrician degree or a diploma stating that the student has successfully completed a Residential Electrician program.

7. POST-SECONDARY ELECTRICAL PROGRAM CONTENT: RESIDENTIAL ELECTRICIAN

A. CONTACT HOURS.

A post-secondary electrical program shall consist of the 14 subject areas that are listed in the “Technical Content” section, to accumulate 1000 hours of student/instructor contact time. Of the 1000 hours:

- 1) A minimum of 800 hours of contact time must be technical electrical instruction.

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- 2) At least 30 percent but not more than 40 percent of the technical electrical contact hours must be lecture, and the balance must be shop or lab hours.

8. ATTENDANCE POLICY:

A post-secondary electrical program must include an attendance policy that requires students to attend a minimum of 95 percent of each required program course. The program must include a provision for students to retake courses or make up portions of courses when the student does not attend 95 percent or more of each required program course (due to an excused absence). Attendance records must be kept at the course level. Course requirements must specify the required coursework for a Residential Electrician.

9. TECHNICAL CONTENT – RESIDENTIAL ELECTRICIAN-

An approved post-secondary electrical program must include course content that covers the following knowledge and skill areas listed in sub-section A through N areas below.

SUBJECT AREAS: RESIDENTIAL ELECTRICIAN

A. ELECTRICAL SAFETY:

- 1) Basic Safety
- 2) Electrical Safety
- 3) Safety and First Aid

B. MATHEMATICS:

- 1) Basic Electrical Mathematics
- 2) Introduction to Construction Math

C. BLUEPRINT READING AND SKETCHES:

- 1) Blueprint Reading and Electrical Symbols
- 2) Introduction to Blueprints
- 3) Introduction to Electrical Blueprints
- 4) Practical Circuit Sketching

D. NATIONAL ELECTRICAL CODE:

- 1) Appliances
- 2) Conductor Selection and Calculations
- 3) Grounding
- 4) Industrial and Commercial Calculations
- 5) Introduction to the National Electrical Code
- 6) Load Calculations-Branch Circuits
- 7) Load Calculations-Feeder and Services
- 8) Motor Calculations
- 9) Overcurrent Protection

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- 10) Raceway, Box and Fitting Fill Requirements
- 11) Wiring Methods

E. AC & DC CIRCUIT THEORY AND PRINCIPLES:

- 1) Alternating Current
- 2) Alternating Current Circuits
- 3) Electrical Fundamentals and Basic Theory
- 4) Electrical Test Equipment
- 5) Electrical Theory
- 6) Principles and Circuitry of Direct Current
- 7) Principles of Alternating Current

F. CONDUIT BENDING:

- 1) Conduit Bending
- 2) Hand Bending

G. LOW VOLTAGE SYSTEMS:

- 1) Cable Tray
- 2) Low Voltage Circuits

H. LIGHTING:

- 1) Electric Lighting
- 2) Illumination and Design
- 3) Lamps, Ballasts, and Components
- 4) Practical Applications of Lighting

I. CARE AND USE OF ELECTRICAL TOOLS AND MEASURING:

- 1) Care & use of Power Operated Tools
- 2) Care and Use of Hand Tools
- 3) Introduction to Hand Tools
- 4) Introduction to Power Tools
- 5) Portable Electric Measuring Devices

J. MOTORS AND GENERATORS:

- 1) Advanced Motor Controls
- 2) Motor Maintenance
- 3) Motors and Generator
- 4) Motors: Theory and Application
- 5) Standby and Emergency Systems

K. CONTROLS AND INSTRUMENTATION:

- 1) Basic Electronic Theory
- 2) Fundamentals of Electronics
- 3) HVAC Controls
- 4) Motor Controls

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L. TRANSFORMERS:

- 1) Distribution System Transformers
- 2) Specialty Transformers
- 3) Transformers

M. FIRE ALARM:

- 1) Fire Alarm System

N. WIRING AND INSTALLATION METHODS:

- 1) Boxes and Fittings
- 2) Circuit Breakers and Fuses
- 3) Conductor Installations
- 4) Conductor Terminations and Splices
- 5) Conductors
- 6) Contactors and Relays
- 7) Distribution Equipment
- 8) Fasteners and Anchors
- 9) Heat Tracing and Freeze Protection
- 10) High Voltage Terminations/Splices
- 11) Installation of Electric Services
- 12) Interior Distribution
- 13) Medium Voltage Circuitry
- 14) Primary Distribution
- 15) Raceways, Boxes, and Fittings
- 16) Sub-Stations
- 17) Wiring Devices
- 18) Wiring: Commercial and Industrial
- 19) Wiring: Residential

10. STATE OF IOWA ELECTRICIAN AND ELECTRICAL CONTRACTOR STATUTE - CHAPTER 103.

To educate electrical program students, it is a requirement that the post-secondary electrical programs for Residential Electrician must give 4 hours of instruction on the Iowa Code chapter 103, "Electricians and Electrical Contractors," including the following:

- A. License requirements (1 hour)
- B. Inspection requirements (1.5 hours)
- C. OJT documentation (1.5 hours)

11. QUALIFICATIONS OF INSTRUCTORS FOR POST-SECONDARY ELECTRICAL PROGRAMS.

- A. Generally. All instructors in an approved post-secondary electrical program shall comply with the minimum standards set out for community college instructors by the Iowa Department of Education in its Iowa Community Colleges State Accreditation Guide. Details regarding each instructor's compliance with Iowa Department of Education requirements shall appear in the program's annual report.

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- B. Licensing, experience, and education. An instructor shall meet one of the following qualifications as a minimum:
- 1) Hold a current license issued by the Iowa Electrical Examining Board as a Class A Master Electrician or a Class A Journeyman Electrician;
 - 2) Have a Bachelor of Science degree in electrical engineering and have 4,000 hours of experience performing electrical work;
 - 3) Have an Associate of Applied Science degree in electrical construction or maintenance, or both, and have 8,000 hours of experience performing industry experience;
 - 4) For courses limited to specific technical or general education areas, other than general wiring methods or the application of electrical codes, be a technical expert based on special training or certification or accreditation in the specific knowledge or skill area.
- C. Notification of change of circumstance. The program must notify the Board regarding a significant change in circumstance involving an instructor in the program. This would include suspension or revocation of the instructor's license, in Iowa or another state, or other disciplinary action issued as a result of misconduct by the instructor. As part of the notification, the program must specify how it will provide qualified instruction to students in the program.

12. ON THE JOB TRAINING (OJT) – RESIDENTIAL ELECTRICIAN

A. AREAS OF CONCENTRATION FOR OJT

- 1) Preliminary Work –
 - a) Learning the names and uses of the equipment used in the trade: kind, size, and use of cable, wire, boxes, conduits and fittings, switches, receptacles, service switches, cutouts, etc.
 - b) Learning the names and uses of the various tools used in assembling this material, care of these tools, and other instructions necessary to familiarize the apprentice with the materials and tools of the trade.
- 2) Rough In Wiring-
 - a) Assisting in getting material from stock room. Loading truck and equipment on-the-job.
 - b) Laying out the various outlets, switches, receptacles, and other details of the job, from blue prints or by direction of the superintendent of construction.
 - c) Cutting wire, cable, conduit, and raceway: threading and reaming conduit, boring and cutting chases under the direction of an electrician.

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- d) Installing various kinds of wires, cables, and conduits in accordance with Requirements.
 - e) Assisting electricians in pulling wires, attaching wires to fish tape and keeping wires from kinks and abrasions.
 - f) Connecting conductors to switches, receptacles, or appliances with proper methods of splicing, soldering, and taping.
 - g) Installing service switches or load centers; and subsequently, feeders, and fastening up these parts, running raceways, and pulling conductors, under the direction of an electrician.
 - h) Assisting in preparing lists of materials used, including names, number of pieces, or number of feet, etc., for office records.
 - i) Loading unused material and cleaning-up of job area.
 - j) Installing rigid conduit, electric metallic tubing, BX armored cable wire molds on all types of heavy electrical equipment and major size service entrance
- 3) Finish Work-
- a) Connecting and setting switches, receptacles, plates, etc.
 - b) Installing and connecting various kinds of electrical utilization equipment.
 - c) Assisting electricians in installation and completion of work in accordance with the rules and regulations of the National Fire Protection Association and special local regulations; proper sizes of wires, service, conduits, etc.
- 4) Special Systems
- a) Wiring of specialized systems to include: sound systems, CRT and data systems, telephones, fire alarm systems, fiber optics, energy management systems, closed circuit TV.
- 5) Trouble Shooting and Service Work-
- a) Repairing all kinds of electrical work.
 - b) Checking out trouble and making repairs under supervision of an electrician.
 - c) Tracking the polarity of conductors and devices.
 - d) Testing the circuit for grounds and shorts and locating and correcting job defects.
- 6) Motor Installation and Controls-
- a) Installing over-current devices.
 - b) Checking for proper installation and rotation.
 - c) Installing replacements motors.
 - d) Analyzing motor circuits and troubleshooting.

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- e) Installing pushbuttons, pilot lights, relays, timing devices, and interlocking controls.
- f) Wiring all types (gas, oil, stoker, etc.) heating equipment.
- g) Installing wiring and controls for air conditioning.

B. ON THE JOB TIME REQUIREMENT – RESIDENTIAL ELECTRICIAN

- 1) For the Residential Electrician
 - a) The student must perform and document 4000 hours of OJT in the 6 required fields within 3 years from the time he/she completes the post-secondary electrical program, to be eligible to test for the State of Iowa sponsored Residential license. Appeals can be made to the Electrical examining board on a case-by-case basis for hardship circumstances.
 - b) The hours-requirement for the 6 areas of concentration are as follows:
 - 1) Preliminary Work – 300 hours minimum
 - 2) Rough In Wiring – 1200 hours minimum
 - 3) Finish Work- 750 hours minimum
 - 4) Trouble Shooting and Service Work- 500 hours minimum
 - 5) Special Systems -- 200 hours minimum
 - 6) Motor Installation and Controls – 200 hours minimum

C. DOCUMENTATION OF OJT – RESIDENTIAL ELECTRICIAN

- 1) The Unclassified person working toward the 4000 hours of OJT is the sole individual responsible for tracking his/ her hours, as well as providing appropriate and accurate monthly documentation of the required 4000 hours to the Electrical Examining Board. The documentation of the 4000 hours must accompany the application for a Residential Electrician license.
- 2) The hours must be documented in the format the board has established.
- 3) The forms must be signed by both the Unclassified person, and the master supervising the work.
- 4) Hours that are not signed by both the Unclassified person and the master will receive no credit toward the 4000 hour requirement.
- 5) Documentation of all required hours must be submitted with an application to test for the Residential Electrician license. The application must be accompanied by an affidavit, signed by the applicant and each employer/master electrician under which the hours used for application have been obtained. The OJT hours submitted may be subject to an audit by the Board or their designees.

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- 6) At any time during the OJT period, an unclassified person may be asked by the Board to produce documentation of the hours he/she has accumulated, for the purpose of performing audits.
- D. LICENSE REQUIREMENT DURING OJT.
- 1) The student must be registered with the State of Iowa as an “Unclassified Person,” and follow all the procedures required during the OJT requirement, in order to receive credit to qualify for testing.
 - 2) If at any time the Unclassified license is suspended, revoked, or denied for renewal, the Board may prohibit future licensure of that person in Iowa. If the Unclassified person’s license is suspended or revoked in another state, the Unclassified person has a duty to report that action to the Iowa Electrical Examining Board. The Board may prohibit that person from being licensed in Iowa.
- E. SUPERVISION DURING OJT – RESIDENTIAL ELECTRICIAN
- 1) In order to receive credit toward the 4000 hours of required OJT, the student must work in the State of Iowa under the supervision of a State of Iowa Licensed Residential Electrician or State of Iowa Residential Master or State of Iowa Licensed Journeyman Electrician (Class A/B) or a State of Iowa licensed Master Electrician (Class A/B) for the time accumulated to be credited. The person who does the supervision must not be under any disciplinary action, or pending any disciplinary action by the Electrical Examining Board. Direct supervision may be provided by a State of Iowa Licensed Residential Electrician or Iowa Licensed Journeyman Electrician (Class A/B), but the documentation regarding hours of work must be signed by a master electrician.
 - 2) The unclassified person must be licensed by the State of Iowa as an “Unclassified Person” during all times of OJT in order to receive credit. The Unclassified person must remain in good standing, and not be the recipient of any discipline from the Electrical Examining Board. The Unclassified person must promptly report any disciplinary complaints or actions taken in another jurisdiction, which would justify discipline by the Iowa Electrical Examining Board in similar circumstances occurring in Iowa.
 - 3) The unclassified must be supervised following the 3:1 ratio, as stated in Iowa Code section 103.15, paragraph 3. The unclassified person and the supervisor of the OJT also are responsible for knowing and following the practices of any and all sections of Iowa Code chapter 103, Electricians and Electrical Contractors.