Eastern Center for Arts and Technology

Program Review
Final Report

ELECTRICAL TECHNOLOGY

2016

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ANALYSIS OF LABOR MARKET DATA

Data from the Dodge Construction Outlook Report, 2015 Edition indicates that the construction sector is expected to grow by 15% in commercial as well as residential in 2015. Institutional construction is expected to see a 9% growth this year. Job opportunities should grow in upwards of 20% from 2012 to 2022. The need to replace experienced repairers who transfer to other occupations or who retire or stop working for other reasons will account for the majority of job openings. Opportunities should be best for persons with the widest variety of skills in electrical.

The Occupational Advisory Committee reviewed the supply/demand data and concluded that it fairly represents the state of the industry in EASTERN's employment area.

STUDENT COMPLETION, PLACEMENT AND FOLLOW-UP INFORMATION

Graduate follow up data for the four-year period June 2012 through June 2015 indicates that 92% of all students completed all tasks for their career objective and received a final grade of 70% or above. The overall placement rate for entry into related occupations or related schooling immediately following graduation was approximately 72%. Electrical Technology students placing Advanced and/or Competent reached 92% from 2012 through June 2015 on the NOCTI exam. Based on the labor market data and the graduate placement data for EASTERN's students, it was agreed that the Electrical Technology Program should be continued.

PROGRAM SPECIFIC QUESTIONS

1. What is the impact of home building automation on the curriculum?
    a. The curriculum covers basic device installation. The real change is in program and communication of the new types of systems. This can be accomplished by having a demonstration board made up of many different control types. A topic should be added to the Program of Study to include various types of home integration and automation devices.

2. What if any are the curriculum/training implications of the replacement of the conventional bulb with light-emitting diodes (LEDs)?
    a. The real change to the curriculum that needs to be implemented in regards to LED lighting is the way that we dim LED's. The program should look into purchasing some LED and CFL dimmers that require different wiring patterns to complete this task.

3. What if any are the curriculum/training implications of wireless technology in home automation, security, and telecommunications?
    a. Wireless technology has become more reliable and increasingly used. We have covered wireless technology in home automation above but as for security we currently do not have any security tasks on the Task List. Wireless technology in telecommunications still requires a data wire to be run and terminated prior to device installation. The use of wireless technologies has little to no impact on our training that is currently being offered.

TRENDS IN THE ELECTRICAL INDUSTRY

In October, the Occupational Advisory Committee (OAC) examined trends in the industry as they relate to Technology, Business Operations, Structure of the Industry and Types of Employees/Skills Required for Employment. Based on the resident expertise of the Occupational Advisory Committee, the following industry trends were identified:

EMERGING TRENDS

- The term cogeneration is still trending in our industry with the increase in grants for large installation and the need for better backup systems and redundancy. The industry is seeing system installs in the following areas:
    - Generators (Fossil Fueled)
    - Solar Farms
    - Wind Turbines

TECHNOLOGIES

- Over the last several years the industry has seen several different changes in technologies in the industry. While LED technology is not new it has changed how we accomplish the simple task of dimming. The LED lamps need a more constant power than traditional incandescent lamps therefore causing the need for manufacturers to redesign basic dimmers and dimming systems. The industry is also seeing an increase in electric cars on the road thus increasing the demand for charging stations. The new technology is just another type of device and caused very little change in the industry. The largest change in technology in our industry is the simplicity of whole home system integration. The older home systems were not easy to get them working together, they required many different interfaces and different communication languages. The install of these systems was not an easy task. With the industry starting to utilize Wi-Fi as well as new short wave signaling the devices can be programed and integrated using a web app or smartphone. The systems communicate to each other by being routed through a network hub and control all aspects of home integration from lighting control, security, surveillance and home comfort controls. With the ease of installation and programming, a tech savvy electrician can now design and install a pretty elaborate home automation system.

BUSINESS OPERATIONS

- The committee discussed several topics within business operations including a business model that is made up of an electrician using purchased price guides to estimate, secure, install, and collect payment at a job location. The committee felt that the number of contractors utilizing this method was minimal and felt that it did not reflect on a change in business operation. The committee felt that the electrical industry is still a very personalized service and customers are still looking for customer service that is catered to their individualized needs.

STRUCTURE OF THE INDUSTRY

- Most contractors are looking for well-trained electricians. The typical student will graduate and continue onto post-secondary or an apprenticeship program. Typical contractors are looking for journeymen and apprentices that are working toward journeyman status. Licensing in Pennsylvania is done on a municipality level. The contractor is the only one who is required to be licensed and insured and to cover the electricians working for the company. No real changes have been made to the structure of the industry.
- The industry is made up of three primary areas - residential, commercial, and industrial. Electrical Technology covers all three areas but utilizes residential to teach the basic concepts of the industry. The program as a whole is laid out for the student to spend 70% of the program in residential and 15% in commercial and industrial accordingly. This has worked well to minimize cost and give the students the experience they need to be successful in the industry. There currently is a need for modifications to the facilities to better align with the layout of the curriculum and better serve our students, and provide a fair representation of a real life work environment.

TYPES OF SKILLS REQUIRED FOR EMPLOYMENT

- OSHA 10 Certification
- Hand eye coordination
- Good color vision
- Ability to climb ladders to moderate heights
- Ability to use basic hand tools
- Ability to use basic power tools
- Basic understanding of primary device function and installation practices
- Basic pipe bending skills

RECOMMENDATIONS

Equipment/Tools

The OAC is recommending a new residential mock up that can accommodate the entire class in one location. It is recommended to have the ability to see the entire class while standing at any location in the shop for safety concerns. The mock up should be centrally located in the shop. The OAC recommends a minimum of a 4' x 4' workspace for each student. With the relocation of the mock up to the center of the shop the OAC recommends to reconfigure the existing outside mock up for Motor controls and Telecommunications so the equipment is not out in the open vulnerable for damage. The OAC is also recommending new tables to be purchased and placed around the shop to create a more team like approach. The tables should be of standing height and eliminate the need for stools in the shop to mimic a job site atmosphere.

The committee also feels the need to put a plan in place for replacement of the mock up. The committee feels that the studs should be replaced every other year and a total mock up replacement every 5 years. This will keep the mock up consistent with new residential construction practices.

The OAC is recommending the purchase of some new lighting controls that are currently being used in Commercial and Residential applications. The new devices should be added to the curriculum under "installing various special switches and receptacles". The device tasks will also need to be added to the lighting control workbook.

The OAC will look into the addition of ELO's to curriculum in the topics of solar, photovoltaic and current trends.

EQUIPMENT RECOMMENDATIONS WITH PURCHASING TIMELINE:

SCHOOL YEAR 2016-17

- New mock up structure $4,000.00 est.
- Reconfiguration of wall space and existing mock up $500.00 est.
- New standing height tables $4,000.00

SCHOOL YEAR 2017-18

Lighting Controls $2,000.00 est.

SCHOOL YEAR 2018-19

Mock Up Stud Replacement $800.00 est.