ACT 331: ELECTRICAL FUNDAMENTALS

New Course Proposal

Date Submitted:Thu, 12 Sep 2019 21:13:21 GMT

Originator

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Justification / Rationale

Construction is one of the top employment opportunities in the Coachella Valley and with the new Title 24 requirements for Zero Net Energy construction, there is a need for a more educated construction workforce. This is one of two modules that mirror the credit course ACT 031. Module 1 is an introduction to residential wiring and grounding, and covers the installation of panels, switches, receptacles, lighting, and other outlets. In addition, load calculations are used to size the electrical service for dwellings. Safety procedures are emphasized. Module 2 is a practical lab demonstrating the procedures learned in ACT 331.
Providing this non-credit version allows those currently unemployed or underemployed to gain the skills and knowledge required to obtain and succeed in construction jobs; providing the modules as a credit overlay allows students to qualify for credit by exam and move into a credit pathway to continue education.

Effective Term

Fall 2020

Credit Status

Noncredit

Subject

ACT - Applied Construction Technolog

Course Number

331

Full Course Title

Electrical Fundamentals

Short Title

ELECTRICAL FUND

Discipline

Disciplines List
Construction Technology

Modality

Face-to-Face
100% Online

Catalog Description

This course is an introduction to residential wiring and grounding, and covers the installation of panels, switches, receptacles, lighting, and other outlets. In addition, load calculations are used to size the electrical service for dwellings. Safety procedures are emphasized.

Schedule Description

Introduction to residential wiring and grounding, and covers the installation of panels, switches, receptacles, lighting, and other outlets. Advisory: ACT 320A

Non-credit Hours

54

Lecture Units
0

Lab Units
0

Lab Semester Hours
0

In-class Hours
18

Out-of-class Hours
36

Total Course Units
0

Total Semester Hours
54

Override Description
Noncredit courses do not have lecture and lab. The out of class hours were adjusted to provide the same total as the equivalent credit course.

Prerequisite Course(s)
Advisory: ACT 320A

Required Text and Other Instructional Materials

Resource Type
Book

Author
National Center for Construction Education and Research

Title
Construction Technology-Trainee Guide

Edition
4th

City
Gainesville, FL

Publisher
Pearson Prentice Hall

Year
2016

College Level
Yes

Flesch-Kincaid Level
12

ISBN #
ISBN 9780134130392

Class Size Maximum
20

Entrance Skills
Safety hazards on construction sites.

Requisite Course Objectives
ACT 320A-Discuss common safety hazards on construction sites.

Entrance Skills
Understand the impact of construction on environment.

Requisite Course Objectives
ACT 320A-Understand the impact of construction to the environment.

Entrance Skills
Understand the purpose of the Occupational Safety and Health Administration (OSHA) and their regulations for the construction industry.

Requisite Course Objectives
ACT 320A-Explain the purpose of Occupational Safety and Health Administration (OSHA) and their regulations for the construction industry.

Entrance Skills
Understand common American National Standards Institute (ANSI) hand signals.

Requisite Course Objectives
ACT 320A-Demonstrate proper use of American National Standards Institute (ANSI) hand signals.

Entrance Skills
Interpret information and instructions presented in both written and verbal form.

Requisite Course Objectives
ACT 320A-Demonstrate the ability to interpret information and instructions presented in both written and verbal form.

Course Content

1. Overview of the electrical trade.
2. Electrical shock.
3. Reducing the risk of hazardous situations.
4. OSHA.
5. NFPA 70E.
6. Ladders and scaffolds.
7. Basic tools safety.
8. Confined space entry procedures.
9. Basic first aid.
10. Solvents and toxic vapors.
11. Asbestos.
12. Batteries.
13. PCBs and vapor lamps.
14. Fall protection.
15. Sizing the electrical service.
16. Sizing residential neutral conductors.
17. Sizing the load center.
18. Grounding.
19. Installing the service entrance.
20. Electrical panel location.

21. Wiring methods.
22. Equipment grounding system.
23. Branch circuit layout for power.
24. Branch circuit layout for lighting.
25. Outlet boxes.
26. Wiring devices.
27. Lighting control.
28. Electrical wiring Residential swimming pools, spas, and hot tubs.

Course Objectives

	Objectives
Objective 1	Explain the safe working practices in the construction environment.
Objective 2	Explain the purpose of OSHA and how it promotes safety on the job site.
Objective 3	Identify electrical hazards and how to avoid or minimize them in the workplace.
Objective 4	Explain safety issues concerning lockout / tagout procedures, confined space entry, respiratory protection, and fall protection systems.
Objective 5	Explain the development of a task plan and a hazard assessment for a given task and select the appropriate PPE and work methods to safely perform the task.
Objective 6	Explain the role of the National Electrical Code in residential wiring.
Objective 7	Describe how to determine electric service requirements for dwellings.
Objective 8	Explain the grounding requirements of a residential electric service.
Objective 9	Explain how to calculate and select service-entrance equipment.
Objective 10	Describe the proper wiring methods for various types of residences.
Objective 11	Explain the proper computation for branch circuit loads and explain their installation requirements.
Objective 12	Explain the types and purposes of equipment grounding conductors.
Objective 13	Explain the purpose of ground fault circuit interrupters.
Objective 14	Discuss outlet boxes and select the proper type for different wiring methods.
Objective 15	Describe the installation rules for electrical systems around swimming pools pas, and hot tubs.
Objective 16	Explain how wiring devices are selected and installed.
Objective 17	Describe the installation and control of lighting fixtures.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Outline the purpose of OSHA and the safety procedures in the workplace.
Outcome 2	Explain the role of the National Electrical Code in residential wiring.
Outcome 3	Design the electric service requirements in a dwelling.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Participation	Individual and group participation in evaluation of electrical construction options.
Lecture	Introduce topics in context.
Discussion	In class and online evaluation of electrical construction options, methods and safety issues.
Other (Specify)	Evaluate electrical installations at job sites
Activity	Develop procedures for estimating materials for electrical services in residential construction.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Written homework	Determination of appropriate materials, methods, and safety procedures for installing electrical service to a residence.	Out of Class Only
Other	Quizzes, In-class exercises, Participation during office and site visits	In and Out of Class
Student participation/contribution	Individual and group participation in evaluation of written homework proposals.	In and Out of Class
Group activity participation/observation	Participation in discussion of material estimates, procedures, and safety issues.	In and Out of Class
Other	Out-of-class hours will be accounted for electronically through the learning management system.	Out of Class Only

Assignments

Other In-class Assignments

1. Individual projects to develop materials estimates.
2. Individual projects to develop safe and effective procedures for installing electrical service to a residence or outdoor structure.
3. Small group projects to evaluate proposals.

Other Out-of-class Assignments

1. Review questions.
2. Prepare materials recommendations and estimates.
3. Short response papers to evaluate estimates and methods.
4. Vocabulary terms.

Grade Methods

Pass/No Pass Only

Distance Education Checklist

Instructional Materials and Resources

If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?

Only the college LMS will be used.

Effective Student/Faculty Contact

Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?

Within Course Management System:

Timely feedback and return of student work as specified in the syllabus
Discussion forums with substantive instructor participation
Regular virtual office hours
Online quizzes and examinations
Video or audio feedback
Weekly announcements

External to Course Management System:

Direct e-mail
Posted audio/video (including YouTube, 3cmediasolutions, etc.)

Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.

Timely feedback and return of student work as specified in the syllabus.
Discussion forums with substantive instruction participation.
Online quizzes and examinations.

Weekly announcements.

Other Information

MIS Course Data

CIP Code
46.0412 - Building/Construction Site Management/Manager.

TOP Code
095700 - Civil and Construction Management Technology

SAM Code
C - Clearly Occupational

Basic Skills Status
Not Basic Skills

Prior College Level
Not applicable

Cooperative Work Experience
Not a Coop Course

Course Classification Status
Other Non-credit Enhanced Funding

Approved Special Class
Not special class

Noncredit Category
Short-Term Vocational

Funding Agency Category
Not Applicable

Program Status
Program Applicable

Transfer Status
Not transferable

Allow Audit
No

Repeatability
No

Materials Fee
No

Additional Fees?
No

Approvals

Curriculum Committee Approval Date
10/17/2019

Academic Senate Approval Date
10/24/2019

Board of Trustees Approval Date
11/13/2019

Chancellor's Office Approval Date
01/10/2020

Course Control Number
CCC000611534

Programs referencing this course
Construction Technology Electrical Certificate of Completion (http://catalog.collegeofthedesert.eduundefined?key=286/)
Construction Technology Career Preparation Certificate of Completion (http://catalog.collegeofthedesert.eduundefined?key=292/)