



Course Title: Electrical Trade Lab 2

Course #: ELC 112-1

Credit Hours: 2

Semester: Spring 2022

Cap: 10

Faculty: Virgil T. House

E-mail: vhouse@navajotech.edu

Office: Room 123, Trades Building

Office Phone: (505) 387-1047

Office Hours (face-to-face or online): 8:00am-5:00pm M-F

Preferred Communication (email and/or text; will respond within 24 hours): vhouse@navajotech.edu

Or cell phone number (505) 459-0518

Modality (face-to-face, hybrid, or online):

Class Location and Meeting Times (if face-to-face): Trades Building, Rm 123 10:00am-12:30pm T/TH

Meeting Hours and Online Hours (if hybrid):

Required Materials:

Textbooks: 3rd Edition Electricians Guide to Conduit Bending

Richard A. Cox

Website: www.cox.net 1(800) 257-0941

Tools: Returning students should already have hand tools.

Lab Fee (if applicable): Yes

Mission, Vision, and Philosophy

Mission: Navajo Technical University honors Diné culture and language, while educating for the future.

Vision: Navajo Technical University provides an excellent educational experience in a supportive, culturally diverse environment, enabling all community members to grow intellectually, culturally, and economically.

Philosophy: Through the teachings of Nitsáhákees (thinking), Nahátá (planning), Íina (implementing), and Siihasin (reflection), students acquire quality education in diverse fields, while preserving cultural values and gaining economic opportunities.

Course Description: This course is a continuation of electrical trade lab 1. Students are taught how to use a variety of hand benders (1/2'-1 1/4"), the computations, the placement of marks on the conduit, for any angle bend. There are mechanical benders, electric benders, and hydraulic benders used in the field. The type of conduit installed for construction: Metal Clad Cable: Type MC, Electrical Metallic Tubing: Type EMT, Flexible Metallic Conduit: Type FMC, Intermediate Metal Conduit: Type IMC, Rigid Metal Conduit: RMC, Rigid Polyvinyl Chloride Conduit: PVC, Liquidtight Flexible Metal Conduit: Type LFMC, and Underground Feeder and Branch-Circuit Cable: Type UF. Supervised work

experience/internship will enhance students' abilities in problem solving and allow them to gain knowledge and experience in the installation of wiring and equipment. The National Electrical Code will be used to determine correct procedures in the installation, fabrication, design, and testing of electrical equipment. This course is for students pursuing an Electrical Trades Certificate and is not required course for students working toward their A.A.S in Energy Systems.

Course Outcomes	Course Assessments
Working Safely in a Commercial and Residential Wiring environment	Hands-On Procedures
Proper Tool usage	Hands-On Procedures
Safety: Identify Hazards associated with electrical work	Hands-On Procedures
Material Identification	Hands-On Procedures
Electrical Drawings and Schematics	Quiz, Exams, and Hands-On Procedures
Conduit Bending and Installation	Quiz, Exams, and Hands-On Procedures
Sizing Proper Wire Usage	Quiz and Hands-On Procedures
Branch Circuitry and Complex Wiring Systems	Quiz, Exams, and Hands-On Procedures

Connections to Program Assessment (Course-Embedded Measures)

Course Activities

Week	Date	Class Topics/Reading Due	Assignments Due	Assessments
1	1/17-1/21	Handout: Working w/ Metallic-Sheathed Cable Due 1/25	NEC Article 330 Metal-Clad Cable: MC	Test 1/25
	Jan. 21	Last day to add/drop		
2	1/24-1/28	Continue w/ Type MC Due 2/1	Material Identification for Commercial Wiring and Branch Circuitry	Test 2/1
3	1/31-2/4	Handout: Working w/ Conduit Trigonometry: Using the calculator to find angles and multipliers Due 2/8	NEC Article 358 Electrical Metallic Tubing, Conduit Hand Bending, and Branch Circuitry	Test 2/8
4	2/7-2/11	Continue w/ EMT Due 2/15	Conduit bending: Stubs, offsets, back to back, 3 & 4 bend saddles, kicks, and parallel offsets.	Test 2/15

5	2/14-2/18	Continue w/ EMT Due 2/22	Hand Bending: Stubs, offsets, kicks, 3 and 4 bend saddles, and push thru method	Test 2/22
6	2/21-2/25 21 st President's Day	Intermediate Metal Conduit Due 3/1	NEC Article 342 Intermediate Metal Conduit, Mechanical bender	Test 3/1
	Feb.25	Graduation Petition Due		
7	2/28-3/4	Continue w/ Intermediate Metal Conduit Bending Due 3/18	Mechanical Bender: Stubs, Offsets, Bending	Test 3/8
	Mar.31	Last day to withdraw with "W"		
8	3/7-3/11	Midterm Grades due 3/11	Midterm Exam 3/10	Comprehensive exam and conduit bending.
9	3/14-3/18	Spring Break		
10	3/21-3/25	Rigid Metal Conduit Due 3/29	NEC Article 342 Rigid Metal Conduit, Bending RMC w/ Electric Bender (Triple 555)	Test 3/29
11	3/28-4/1	Continue w/ Rigid Metal Conduit and Pipe Threading Due 4/5	Stubs, Offsets, Threading RMC with the Hand Pony and Rigid 300	Test 4/5
12	4/4-4/8	Continue w/ Rigid Metal Conduit and Pipe Threading Due 4/12	Stubs, Offsets, Threading RMC with the Hand Pony and Rigid 300	Test 4/12
13	4/11-4/15	Rigid Nonmetallic Conduit (PVC) Polyvinyl Chloride Schedule 40 & 80 Due 4/19	NEC Article 352 Rigid Polyvinyl Chloride Conduit PVC Electrical Heating Box 1/2"- 2" & 1/2"- 6"	Test 4/19
14	4/18-4/22	Continue w/ PVC Due 4/26	Heating conduit to make stubs and offsets, and a variety of fittings	Test 4/26

15	4/25-4/29	Conduit Bending w/ Greenlee CT 881 Hydraulic Bender Due 5/2	Bending 90 degree stubs and offsets, 2 ½' – 4" Conduits	Test 5/2
16	5/2-5/6	Continue w/ Greenlee CT 881 Hydraulic Bender Due 5/10		Test 5/10
17	5/9-5/13	Final Exam May12	Finals	Comprehensive exam and conduit Bending
		Grades due to the Registrar 5/12		
		Graduation 5/13		

Grading Plan

Homework: 25%

Attendance: 5%

Class Participation: 5%

Quizzes and Test: 25%

Mid-term: 40%

Portfolio:

Home work: 25%

Attendance: 5%

Class Participation: 5%

Quizzes and Test: 25%

Final Exam: 40%

A = 100-90%

B = 89-80%

C = 79-70%

D = 69-60%

F = 59% or less

This class is required to pass with a Final Grade of “C”. If one does not meet the passing grade, the student will be required to repeat the class!

Grading Policy

Students must do their own work. Cheating and plagiarism are strictly forbidden. Cheating includes (but is not limited to) plagiarism, submission of work that is not one's own, submission or use of falsified data, unauthorized access to exams or assignments, use of unauthorized material during an exam, or supplying or communicating unauthorized information for assignments or exams.

Participation

Students are expected to attend and participate in all class activities. Points will be given to students who actively participate in class activities including guest speakers, field trips, laboratories, and all other classroom events.

Cell phone and headphone use

Please turn cell phones off **before** coming to class. Cell phone courtesy is essential to quality classroom learning. Headphones must be removed before coming to class.

Attendance Policy

Students are expected to attend all class sessions. A percentage of the student's grade will be based on class attendance and participation. Absence from class, regardless of the reason, does not relieve the student of responsibility to complete all course work by required deadlines. Furthermore, it is the

student's responsibility to obtain notes, handouts, and any other information covered when absent from class and to arrange to make up any in-class assignments or tests if permitted by the instructor. Incomplete or missing assignments will necessarily affect the student's grades. Instructors will report excessive and/or unexplained absences to the Counseling Department for investigation and potential intervention. **Instructors may drop students from the class after three (3) absences unless prior arrangements are made with the instructor to make up work and the instructor deems any excuse acceptable. All absences excused or unexcused will be considered not attending class! If you were to have a total of 4 combined, you will be dropped from the class.**

Study Time Outside of Class for Face-to-Face Courses

For every credit hour in class, a student is expected to spend two hours outside of class studying course materials.

Study Time for Hybrid or Blended Courses

For a hybrid or blended course of one credit hour, a student is expected to spend three hours per week studying course materials.

Study Time for Online Courses

For an online course of one credit hour, a student is expected to spend four hours per week studying course materials.

Academic Integrity

Integrity (honesty) is expected of every student in all academic work. The guiding principle of academic integrity is that a student's submitted work must be the student's own. Students who engage in academic dishonesty diminish their education and bring discredit to the University community. Avoid situations likely to compromise academic integrity such as: cheating, facilitating academic dishonesty, and plagiarism; modifying academic work to obtain additional credit in the same class unless approved in advance by the instructor, failure to observe rules of academic integrity established by the instructor. **The use of another person's ideas or work claimed as your own without acknowledging the original source is known as plagiarism and is prohibited.**

Diné Philosophy of Education

The Diné Philosophy of Education (DPE) is incorporated into every class for students to become aware of and to understand the significance of the four Diné philosophical elements, including its affiliation with the four directions, four sacred mountains, the four set of thought processes and so forth: Nitsáhákees, Nahát'á, Íína and Siih Hasin which are essential and relevant to self-identity, respect and wisdom to achieve career goals successfully.

At NTU's Zuni Campus, the A:shiwí Philosophy of Education offers essential elements for helping students develop Indigenous and Western understandings. Yam de bena: dap haydoshna: akkya hon detsemak a:wannikwa da: hon de:tsemak a:ts'umme. *Our language and ceremonies allow our people to maintain strength and knowledge.* A:shiwí core values of hon i:yyułashik'yanna:wa (respect), hon delank'oha:willa:wa (kindness and empathy), hon i:yyayumola:wa (honesty and trustworthiness), and hon kohoł lewuna:wediyahnan, wan hon kela i:tsemanna (think critically) are central to attaining strength and knowledge. They help learners develop positive self-identity, respect, kindness, and critical thinking skills to achieve life goals successfully.

Students with Disabilities

Navajo Technical University is committed to serving all students in a non-discriminatory and accommodating manner. Any student who feels that she or he may need special accommodations should contact the Accommodations Office (<http://www.navajotech.edu/student-services#accomodations->

[services](http://www.navajotech.edu/images/about/policiesDocs/Disability_Exhibit-A_6-26-2018.pdf)) in accordance with the university's Disability Accommodations Policy (see http://www.navajotech.edu/images/about/policiesDocs/Disability_Exhibit-A_6-26-2018.pdf).

Email Address

Students are required to use NTU's email address for all communications with faculty and staff.

Final Exam Date: May 12, 2020