



Course Outline

Course Title: E-Transportation Basics (E-bike Repair & Maintenance)

Course Framework: 40 hours

Course Methods: Lecture, active learning exercises, on-the-job training

Course Designer: WestEd

Course Purpose:

This course provides a foundational understanding on repair and maintenance as it pertains to E-bicycles and use of electrical-based modes of transportation. Throughout the duration of this course, learners will develop their mechanical aptitude and enhance their literacy of E-bicycle safety, mechanics, and general maintenance by applying an understanding of general bicycle maintenance.

Course Description:

This course engages learners in understanding the fundamentals of E-transportation modes grounded in E-bicycle and traditional bicycle standards for safety, quality maintenance and repair, and methods for addressing critical issues pertaining to E-bike mechanics. This class will advance the learner's understanding of bicycle mechanics and electrical safety.

Learning Objectives:

By the end of this course, learners will have:

1. Comprehensive understanding of E-bicycle safety
2. Proficiency in principles of E-bike components
3. Understanding of structured methods for evaluating repair needs
4. Understanding of Suspensions, Forks, & Brakes
5. Competency in working with Lithium batteries
6. Understanding of Cables/housing
7. Proficiency in the maintenance of wheels and repair of tires
8. Proficiency in general bicycle mechanics and E-bike mechanics

Assessment:

Learners will be assessed on the attainment of knowledge and competencies in each module. The instructor will provide the opportunity for each learner to demonstrate their proficiencies in an activity representing each course competency. The instructor will provide feedback to the learner on areas in which they excel and itemize areas in need of improvement.

Course Polices:

Learners are expected to conduct them selves in a professional manner, maintaining attention to safety at all times. Learners are expected to be courteous and respectful to one another and their instructor.

Course Modules

Module Topic	Module Objective	Instructional Materials & Assessment
Module 1 Safety & Owner's Manual	Provide an overview of E-bikes and safety protocols.	Course content as found in lesson plans, YouTube videos, online articles. Assessment: In class exercises, discussion, and written exercises.
Module 2 General Safety for Bicycle Maintenance	Understand the function of the work environment, the use of the correct tools, and the components of an E-bike.	Course content as found in lesson plans, YouTube videos, online articles.
Module 3 Introductions to Bicycle lithium batteries	Learn battery specification, safety considerations, safety features, battery issues.	Assessment: In class exercises, discussion, and written exercises.
Module 4 Introductions to Bicycle lithium batteries	Understanding the components of E-bike motors and charging systems. Understand the charging process.	Course content as found in lesson plans, YouTube videos, online articles.
Module 5 E-bike motors and Charging Components	Learn the different motor styles available and the pros and cons of each.	Assessment: In class exercises, discussion, and written exercises.
Module 6 Central Processing Units	Understand the functionality of the E-bike CPU	Course content as found in lesson plans, YouTube videos, online articles.
Module 7 Assembly of Drop Cycles E-bike	Complete assembly and first test ride of Drop Ebike	Assessment: In class exercises, discussion, and written exercises.
Module 8 Define the individual bicycle components	Identify the name and function of bicycle components	Course content as found in lesson plans, YouTube videos, online articles.
Module 9 Throttles, brake levers, shifters	Learn differences in types, styles, and functions of each.	Assessment: In class exercises, discussion, and written exercises.
Module 10 Bicycle Rim	Provide an overview of different rim sizes, rim widths, spoke counts, materials, and uses.	Course content as found in lesson plans, YouTube videos, online articles.

Module 11 The Bicycle Hub	Provide an overview of the bicycle hub. Including geared, single speed, front, rear, coaster.	Assessment: In class exercises, discussion, and written exercises.
Module 12 The Bicycle Cranks	Understand cranks and crank sets.	Course content as found in lesson plans, YouTube videos, online articles.
Module 13 Chain rings and Chain wheels	Understand the purpose and use of chain rings and chain wheels	Assessment: In class exercises, discussion, and written exercises.
Module 14 The Chain Replacement	Replacing the chain. When to replace. Compatibility of chain and gears.	Course content as found in lesson plans, YouTube videos, online articles.
Module 15 The Derailleur and Shifter	Comprehend the purpose and operations of the derailleur and shifter.	Assessment: In class exercises, discussion, and written exercises.