

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: ELE 295

Credits: 1

Course Title: Electric Vehicle (EV) Technology and Infrastructure

Course Description (as it should appear in the catalog)

Addresses EV technology and infrastructure primarily from the perspective of the individual consumer. Includes types of electric and electric-hybrid vehicles, typical dealer and vendor services, costs, operational considerations, maintenance, vehicle energy storage systems, types of vehicle charging systems, typical home energy use patterns, typical home wiring options for EV charging systems and the permitting and inspections required for them, and electric rate schedules. Actual course schedule is four hours per day for four days. Lecture 1 hour per week (if offered for 16 weeks).

General Course Purpose: This course addresses many topics about electric vehicles and their evolving infrastructure. With the information and contacts available from this course, and the typical calculation examples covered, students will be better able to analyze their own situations and make informed decisions about acquiring and operating such vehicles. This course will be accepted as elective credit toward the Electronics Technology CSC program.

Course Objectives (Each item should complete the following sentence.)

Upon completing the course, the student will be able to:

1. Identify types of electric and hybrid-electric vehicles
2. Identify typical services expected of EV dealers and related vendors
3. Estimate the annual ownership cost for an EV
4. Identify the types of preventive maintenance required for an EV
5. Describe special considerations related to energy-limited EV operations, such as trip planning and use of vehicle accessories
6. Describe typical energy use patterns in the home and estimate home energy demands
7. Identify the various types and basic specifications for EV charging systems
8. Identify typical home wiring modification options needed to accommodate the different types of EV charging systems
9. Select the EV charging system best suited to the student's individual situation
10. Describe the sequence and a typical timeline for permitting, installation and inspection of a Level II charging system in the home.
11. Evaluate electric rate schedule options and select the best rate schedule to request for the addition of an EV charging system to the home.
12. (Optional) Discuss generally the optimization of home energy use patterns and costs for EV charging through consideration of additional insulation, new lighting, centralized lighting and appliance controls, possible solar and/or wind alternative energy sources if feasible for a particular home and time-of-day energy use.
13. (Optional) As the regional EV infrastructure develops, identify local commercial charging locations and costs, EV support groups and other infrastructure resources.

Major Topics to be Included

1. Types of electric and electric-hybrid vehicles
2. Typical dealer and vendor services
3. EV ownership costs
4. EV operations considerations
5. EV maintenance considerations
6. EV energy storage systems
7. Types of EV charging systems
8. Typical home energy use patterns
9. Typical home wiring options to support EV charging
10. Typical permitting, installation and inspection sequences for EV charger installation in the home
11. Electric rate schedules

Effective Date of Course Content Summary (Month, Date Year): May 23, 2011