

# Electric Vehicle Technology

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## Overview

This is a follow-on to the Electric Vehicle Revolution course. It focuses on the science and technology that makes modern EVs possible. Topics will include: (1) Efficiency, (2) Battery Technologies, (3) Motors, (4) Electronics, (5) charging infrastructure, (6) current limitations, and (6) future advancements. The previous EV course is not a prerequisite.

## Course Outline

1. The physics behind efficient vehicles
2. EV batteries
  - 2.1. How they work
  - 2.2. Different chemistries
  - 2.3. Battery management and charging systems
  - 2.4. Recycling
  - 2.5. Factors that limit capacity and charging speed
3. EVs use AC motors
  - 3.1. How they work
  - 3.2. Induction motors
  - 3.3. Permanent magnet motors
  - 3.4. Inverters
  - 3.5. Regenerative braking
  - 3.6. Factors that limit efficiency
4. Charging infrastructure
  - 4.1. The grid may be the major limit to charging speed
  - 4.2. How fast does charging really need to be?
  - 4.3. Controlling the electric grid load
  - 4.4. Making charging more convenient
5. The future
  - 5.1. Battery improvements
  - 5.2. Efficiency and range improvements
  - 5.3. Autonomous vehicles