

Spring 2023, EEE498/591 Lithium-Ion Battery Technology for Automotive Electrification

# Course (Catalog) Description

# This special topic is intended for undergraduate and graduate students to gain knowledge of lithium-ion battery technologies for automotive electrification, e.g., electric vehicles. In this lecture, topics on basic operating principles, design and manufacturing methods and battery management of lithium-ion batteries will be discussed.

# Class Meets

# TBD

# Contact Information

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**Office Hours**

Office hours are times when you can meet with your professor to discuss the material being presented in class or other related interests you have. Office hours (TBD)

# Course Topics

1. AUTOMOTIVE ELECTRIFICATION

2. LITHIUM-ION BATTERY CELL FUNDAMENTALS

3. LITHIUM-ION BATTERY TESTING FUNDAMENTALS: METHODS AND METRICS

4. DESIGN AND MANUFACTURING OF HIGH-PERFORMANCE LITHIUM-ION BATTERY: FROM CELLS TO PACKS

5. BATTERY MANAGEMENT SYSTEM FOR ELECTRIC VEHICLE

6. BATTERY LIFETIME PREDICTION TECHNOLOGIES

7. ELECTRIC VEHICLE INFRASTRUCTURES

8. REPURPORSING AND RECYCLING OF LITHIUM-ION BATTERIES

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# Textbooks

# Textbook: TBU

# Prerequisites

The course is targeting junior/senior students or graduate students majoring in electrical engineering or related disciplines. Previous coursework in electrical engineering (e.g., circuits, properties of electronic materials) is desired. Basic knowledge about general chemistry or thermodynamics is not required but will be helpful to understand the topics related lithium-ion battery cell fundamentals.

**Syllabus changes**

Any information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advance notice. \*Note: This is a condensed version of the course syllabus. The full syllabus will be available to students on the course Canvas site at the start of the Spring 2023 semester with more details about the lecture and assignment schedules.