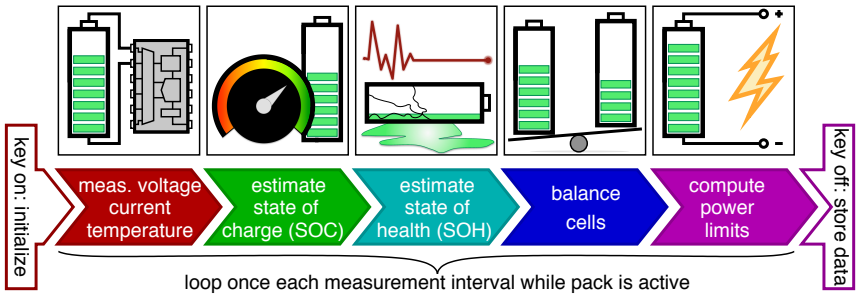
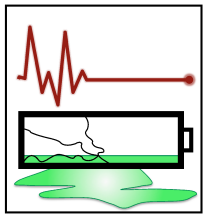
Welcome to the course!

- Welcome to ***Battery State of Health (SOH) Estimation!***
- This course is the fourth in a specialization that investigates the proper management and control of battery packs, usually comprising many cells
- BMS must estimate nonmeasurable quantities that describe battery pack condition



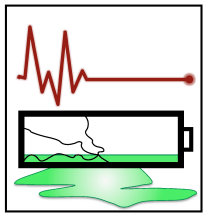
What topics will we study in this course?



In this course, you will learn:

- The primary ways that lithium-ion battery cells degrade over time, motivating a need to be able to adjust cell-model parameter values
- How to estimate cell resistance as it changes over time
- How to estimate cell total capacity as it changes over time using several different methods (and their tradeoffs)
- How to co-estimate the state and parameters of a cell model as both change with different timescales (honors)

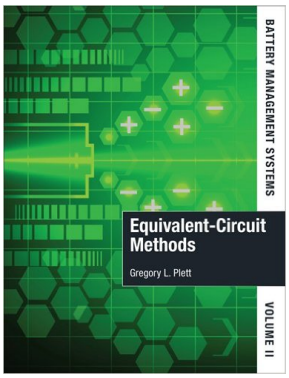
What skills will you gain in this course?



After completing the course, you'll be able to:

- Identify primary degradation mechanisms in lithium-ion cells and understand how they work
- Execute provided Octave script to estimate total capacity using WLS, WTLS, and AWTLS methods and lab-test data, and to evaluate results
- Compute confidence intervals on total-capacity estimates
- Compute estimates of a cell's equivalent-series resistance using lab-test data
- Specify the tradeoffs between joint and dual estimation of state and parameters, and steps that must be taken to ensure robust estimates (honors)

Prerequisites; for further study



Prerequisites:

- Course 1: ***Intro. to Battery Management Systems***
  - Basic background in BMS requirements, sensing
- Course 2: ***Equivalent Circuit Cell Model Simulation***
  - Specific background in ESC cell model
- Course 3: ***Battery State of Charge (SOC) Estimation***
  - Probability theory, nonlinear Kalman filters (honors)

Resource:

- We'll study Ch. 4 of *Battery Management Systems, Vol. 2, Equivalent-Circuit Methods*, Artech House
- For further study, you can confer this optional resource