

**University of Connecticut Department of Mechanical Engineering
UNDERGRADUATE INDEPENDENT STUDY APPROVAL REQUEST**

Title of the Independent Study:.....Prognosis and Diagnostics of Li-Ion Batteries.....

Student's Name and PS Number:.....

Number of credits requested:.....3.....

Date of Request:/...../.....

Instructor's name:

Description of the independent study: Include the list of topics to be covered and any books and other references to be used

Learning Objectives

Operating principles and design/fabrication of Li-Ion batteries, electrochemical kinetics and transport phenomena in rechargeable batteries, electrochemical impedance spectra measurement, simulation and curve-fitting of electrochemical impedance spectra

Relation to ME curriculum

While courses like Sustainable Energy cover rechargeable batteries, they do not go into details of prognosis and experimental diagnostics. This independent study provides an opportunity to gain deeper learning in these areas.

Topics

This independent study will focus on prognosis of li-ion batteries. Experimental methods such as impedance spectroscopy measurement, x-ray computed tomography and thermal imaging will be used to evaluate batteries and predict life of Li-Ion batteries.

Resources

A thorough literature review will be conducted. In addition, "Electrochemical Methods" by Bard and Faulkner will serve as a reference for experimental diagnostics.

Assessment: Describe how the final grade will be determined

Deliverables:

An end of semester report is the major deliverable in addition to the short weekly reports.

Grading Rubric:

End of semester grade will depend on the final report as well as the progress as measured through weekly reports. Accuracy of the data presented in the report as well completeness of the methods development will affect the grade.