

# Syllabus

## ME 594-Energy Storage

INSTRUCTOR: Prof. Reza Shahbazian-Yassar, 3037 ERF, 312.996.3440, [rsyassar@uic.edu](mailto:rsyassar@uic.edu)

*PROF. OFFICE HOURS: Open door. Email for appointments.*

*Designation as a 'Required' or 'Elective' course*

TYPE OF COURSE: Elective

*Course (catalog) description*

COURSE DESCRIPTION: Fundamental understanding of rechargeable batteries and capacitors. Materials design for electrode and electrolytes. Nanoscience applications in batteries. Manufacturing and sustainability of batteries.

*Textbook(s) and/or other required material*

SAMPLE SOURCES AND RESOURCES MATERIALS: **TBD.**

*Course objectives*

COURSE OBJECTIVES: This course is designed to introduce students to the newest developments and current challenges in the field of rechargeable batteries. Strong emphasis will be on Li ion battery technology and the materials design for such batteries. Nanoscience and nanotechnology applications in battery design will be discussed. Part of the course will cover sustainable issues and manufacturing aspects of batteries. Future outlook for the new design of rechargeable batteries beyond Li-ion systems will be discussed too.

*Topics covered*

MAJOR TOPICS:

- Week 1: Introduction to Energy Storage Systems and Devices
- Week 2: Rechargeable Batteries and their Fundamental Electrochemistry
- Week 3: Li-ion Battery Technology and Challenges
- Week 4: Cathode Materials
- Week 5: Anode Materials
- Week 6: Electrolytes
- Week 7: Beyond Li-ion Battery Technologies
- Week 8: Manufacturing Technologies of Batteries
- Week 9: Sustainable Design of Batteries
- Week 10: Capacitors and Supercapacitors

*Class/laboratory schedule, i.e., number of sessions each week and duration of each session*

CREDIT HOURS: 3 hours

TYPE OF INSTRUCTION:

Type of Instruction	Contact Hours/Week
Lecture/Discussion	3
Laboratory	0

CLASS TIME & LOCATION: 3:30 to 4:45 pm, Tuesdays and Thursdays, **Engineering Research Facility 1003**

TEACHING ASSTs: TBD.

TA OFFICE HOURS: TBD

LETTER GRADES: 90-100 A, 80-89 B, 70-79 C, 60-69 D, 0-59 F

WEIGHTING: 20% Homework, 10% Quizzes, 35% Final Presentation, 35% Final Report

TESTS: Absence during a test or quiz will result in a grade of zero. Makeup tests will be given only where a very serious documented reason exists for absence.

HOMEWORK: ***No late homework will be accepted.*** Homework assignments will be given on average at the end of a chapter or set of chapters and will be due the following week, or at the instructor's discretion. In class quizzes will be given at the instructor's discretion.

HONOR CODE: This course and related assignments are being administered under the policies of the Honor Code of the University of Illinois at Chicago (UIC):  
<http://www.uic.edu/depts/honorcode/code.html>

\* The syllabus is subject to change.