Energy Materials  
(MEEN 5800-003, MEEN 4800-003, MTSE 5800-016)

Instructor: Prof. Wonbong Choi  
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Date & Time: Mo, We (11:25AM- 12:30PM); Friday- problem solving session only, it will be scheduled & notified  
Prerequisites: consent of instructor

Course Objectives: The object of the course is to give the students an overview of energy materials which are the basis of modern energy technologies, solar cells and rechargeable batteries.

Course Description: This course will describe how advanced materials make possible efficient energy harvesting (solar cells) and energy storages (rechargeable batteries). Also the course introduces some principles for device applications, and advanced materials for future energy technologies.

Reference books:

- The Physics of Solar Cells, ICP, ISBN 9-781860-943492

Grading plan:

1 Midterm: 35%, 1 Final: 40%  
Quizzes/Homework  20%, Attendance 5% of grade

1. Quizzes are closed-book. Pop-up quizzes will not be announced.
2. Midterm exam will cover Part1. Final exam will cover Part2.
3. Attendance of the class is required.
4. Unethical conduct on quizzes or exams will automatically lead to failure of the course.

Make-up Policy: Make-up tests will not be allowed for any circumstance.

List of topics to be covered (Few topics will be modified based on students’ performance and the changes will be announced during the class)

1. The basic of rechargeable batteries
2. Basic of battery chemistry
3. Materials in Li-ion batteries
4. Battery Characterizations
5. Basic principle of solar cell
6. Solar cell operational parameters
7. Semiconductor
8. Charge transport in semiconductor
9. Photovoltaic device principles
10. Materials for advanced solar cells