About Edwin García

- Associate Professor of Materials Engineering
- Have been at Purdue for seven years
- Focus is on Theory and Simulation of Materials (Kinetics and Thermodynamics)
- Interests include:
  - Microstructure Design
  - Ferroelectrics
  - Energy-related materials (batteries, fuel cells, thermoelectrics, etc.)
  - Colloidal Self-Assembly
More About Edwin García

More Interests:
- Microstructure Evolution
- Super Computing
- Pharmaceutical Materials

Other Interests:
- The Daily Show (whenever possible)
- Mexican Soccer (religiously, every night)
Yet, more about Edwin
Today

- Course Administration
- Office Hours
- Introduction to Batteries
Final Grade Breakdown

• 20% Homework
• 40% Project Report I (including presentation I)
• 40% Project Report II (including presentation II)
Homework

- Homework will be posted on Fridays.
- Will be collected 10 days later, on Mondays, at the beginning of class.
- Group HW (teams of two students) is encouraged.
Term Project

You are expected to write a technical report where you apply your newly acquired knowledge of Battery Modeling

Specialized research fields include:
- Li-ion Battery Technology
- Alkaline Batteries
- Lead-Acid Batteries
- Nickel-Cadmium Batteries
- Nickel-Metal Hydride Cells
Class Website

https://nanohub.org/groups/mserechargeablebatteries
Software

https://nanohub.org/tools/vkmlllive
Adding Yourself to the Class Website

• go to: https://nanohub.org/groups/mse597batterymodeling

   and request to be added to the list

• you are done!
Dates and Deadlines

- **Mid Term Project:** October 16, 18
  - Will establish viability of a battery design
  - Will lay down the background and literature review of a technology that will be analyzed

- **Final Exam:** NO FINAL

- **Revised (Final) Term Project**
  - Will focus on the design of the selected (mid term) system
  - You can submit your written report any time after this date
  - The final submission deadline is December 6th at 4:30PM
  - Final presentation will occur on December 4th and 6th

- **No classes:** Oct 9, Oct 11, Nov 22
Attendance and Participation

Will Keep Track of Students’ Participations

Good Questions and Comments are Encouraged!
References

1. Electrochemical Systems, Third Edition
   John Newman, Karen E. Thomas-Alyea

2. Advanced Batteries
   Robert A. Huggins
   Materials Science Aspects

3. Modern Batteries
   An Introduction to Electrochemical Power Sources, Second Edition
   Colin A. Vincent & Bruno Scrosati
In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Any such changes will be posted to the course website on the nanoHUB. If you are unable to use the nanoHUB from home please let me know early in the semester so I can make other arrangements for your special needs.

Use of cell phones and similar devices, including texting, is strongly discouraged during class. However, please make sure that such devices are set to silent or vibrate mode in order to be informed in case of a campus emergency. If you receive a message indicating an emergency, please communicate Purdue’s announcement to the class.
In Case of a Change of Plans

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- Any such changes will be posted on the course website on the nanoHUB.

- If you are unable to use nanoHUB from home please let me know early in the semester so I can make other arrangements for your special needs.
Academic Dishonesty

Purdue University Regulations, Part 5, Section III-B-2-a describes the formal policies governing academic dishonesty. A guide providing specific examples, tips, and consequences is available from the Office of the Dean of Students at http://www.purdue.edu/ODOS/osrr/integrity.htm. These rules cover not only exams and quizzes, but also graded homework. Copying or sharing any part of the homework solutions is a clear violation of university policy. Transcribing, paraphrasing or following the outline of someone else’s solution(s) is cheating. The test is simple: If you write down your solution after reading or hearing someone else’s solution you are cheating. Likewise, if you share or exchange your solutions with another student, in written or spoken form, you are cheating. Discussion between students of the concepts and general approach to homework problems is encouraged but the solutions you turn in for grading must be your own original work. Specific assignments and activities in MSE that are assigned on a group basis will be clearly indicated.
Evacuation Procedures

- You are in a facility used for research; it is possible that the evacuation horn will sound.
- This is a very loud INSIDE alarm.
- Please walk calmly out of the building and gather outside on Stadium Mall Drive to the Southwest of CIVL.
- Stay in the CIVL area until a police officer gives the all clear.
- It is extremely dangerous to enter a building in the middle of an emergency.
- It is the responsibility of the faculty and staff to execute this emergency plan upon hearing the evacuation siren.

All Hazards Emergency Warning Sirens

- A weather emergency, such as a tornado, will activate the “shelter in place” siren.
- This is a less audible OUTSIDE, area-wide siren.
- Please seek shelter in the basement area.
Evacuation and Shelter-In-Place Procedures

In case of Fire:
Calmly follow the solid gold path to exit the building and assemble 100ft from the SOUTHWEST end of Armstrong.

In case of fire, elevators will not operate.

In case of Shelter-in-Place-Weather-Related Emergencies:
Calmly follow the dotted teal path to the closest stairwell, take it to the LOWER LEVEL and find a shelter location.

In case of Violence:
If incident is occurring in your building, call 911 if possible.

If possible, seek shelter in a lockable or securable room, preferably without windows.
Edwin’s Availability

email: redwing@purdue.edu

phone: (765) 494-0148

In person (see schedule)

office hours: Mondays from 9 to 11AM
Syllabus: Semester Game Plan

• Macroscopic analysis
• Develop background for numerical modeling
• Develop theory for numerical model
• Implement numerical model in lab
• Applications to various material systems
• Student presentations