ENMA 466: Materials Fabrication Lab (Elective) – 3 credits

Class Schedule: Mondays 10AM – 1PM

Instructor: Prof. Gary Rubloff

Textbook: none required

Catalog/Course Description: This course allows students an opportunity to study advanced materials systems in depth through a combination of lectures and hands-on laboratory experiments. Students will be trained in materials processing and characterization techniques. Each student will fabricate materials and devices in our state-of-the-art nanofabrication clean room facility (FabLab) KIM 2304, as well as evaluate them using a variety of characterization techniques.

Prerequisites: ENMA 465

Course Goals:
Students completing this course satisfactorily will:
- Learn about thin film processing methods and equipment used to create materials and structures
- Develop appreciation for characterization and metrology as the measure of success in fabrication
- Understand and demonstrate how patterns are made in materials to achieve device structures (lithography)
- Develop an understanding of how the sequencing of processes is essential to make material structures
- Learn the proper principles and attitudes required for safe operation in clean room fabrication laboratories.

Student Outcomes Covered by the Course:
ABET A: Ability to apply mathematics, science and engineering principles;
ABET B: Ability to design and conduct experiments, analyze and interpret data.
ABET C: Ability to design a system, component, or process to meet desired needs.
ABET F: Understanding of professional and ethical responsibility;
ABET J: Knowledge of contemporary issues
ABET K: Ability to use the techniques, skills and modern engineering tools necessary for engineering.
Topics Covered: Advanced materials processing topics chosen by instructor for a given course. Typical topics include: silicon solar cells, ZnO nanostructures, carbon nanotubes, high energy density nanobatteries and energy storage devices