

**Department of Materials Science and Engineering
University of Maryland, College Park, Maryland**

ENMA 490: Capstone Design Course (Required) – 3 credits

Class Schedule: Mondays and Wednesdays from 12:00-14:50

Instructor: Prof. Ray Phaneuf

Textbook: NA

Catalog Description: Capstone design course. Students work in teams on projects evaluating a society or industry based materials problem and then design and evaluate a strategy to minimize or eliminate the problem; includes written and oral presentations

Course Description: Capstone senior level design course. Students will work in teams to evaluate a society or industry based problem in Materials Science and Engineering and then design and evaluate a strategy to address the problem. The course will include written and oral presentations of the design strategy, implementation and evaluation.

Prerequisites: Senior standing in Materials Science and Engineering

Course goals:

The main objective is to allow students the opportunity to gain experience in: critical analysis of complex problems; design of materials systems and/or processes to address relevant problems; and teamwork. A student who takes this course should learn (1) to work as a team to apply fundamental knowledge of materials to a design problem, (2) about techniques for fabrication related to the specific project, (3) to produce written and oral design reports as a team, and (4) the role of ethics in engineering design.

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 D: Ability to function on multidisciplinary teams.

ABET E: Ability to identify, formulate and solve engineering problems.

ABET F: Understanding of professional and ethical responsibility

ABET G: Ability to communicate effectively;

ABET H: The broad education necessary to understand the impact of engineering solutions in a global and societal context;

ABET I: Recognition of the need for and an ability to engage in life-long learning;

ABET J: Knowledge of contemporary issues

ABET K: Ability to use the techniques, skills and modern engineering tools necessary for engineering practice