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

1. **ENMA 490 – Materials Design**

2. **Credits and contact hours – 3 credits.** The University of Maryland follows the Maryland Higher Education Commission's policies on "contact hours;" specifically, one semester hour of credit will be awarded for a minimum of 15 hours, of 50 minutes each of actual class time, exclusive of registration, study days, and holidays.

   Schedule: meets one 3 hour lab twice a week

3. **Instructor's or course coordinator's name: Prof. Ray Phaneuf**

4. **Text book, title, author and year:** none required

5. **Specific course information**
   a. **Brief description of the content of the course (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.
   b. **Pre-requisites or co-requisites:** Senior standing.
   c. **Indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program:** ENMA 490 is a required course for Materials Science and Engineering majors.

6. **Specific goals for the course:**
   a. **Specific outcomes of instruction**: The outcomes of the course are as follows:
      1. Student teams apply fundamental knowledge of materials to a design problem.
      2. Student learns about techniques for fabrication related to the specific project
      3. Student teams produce written and oral design reports
      4. Students learn the role of ethics in engineering design by including ethics issues in their design presentation
      5. Students learn how to write a research proposal, including searching funding source websites for RFP's, BAA's and Program Announcements

   b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed in this 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