MSE 489 Course Objectives

The objectives of this course are to give the student the capability to select and design materials for a particular engineering application. Specifically, at the completion of this course, the student should be able to:

1. Analyze the application and identify essential and desirable materials properties, including but not limited to mechanical, thermodynamic, transport, and functional properties.
2. Identify and apply relevant government metrics and standards for this application.
3. Perform a literature search to identify current and proposed materials, evaluating the strengths and weaknesses of each material.
4. Identify external constraints, including cost, availability, durability, environmental, and overall sustainability issues associated with the application in general and the proposed materials specifically.
5. Quantitatively compare alternative materials based on both material properties and external constraints, using, for example, a spider chart.
6. Design a material, based on the student's understanding of materials structure/property relationships, that can best satisfy the required properties within the external constraints.
7. Participate as part of a team in the accomplishment of a shared materials selection or design goal.
8. Write a professional technical report describing the materials design project from start to finish.
9. Deliver professional oral presentations describing the materials design project from start to finish.