Six University-wide Goals:
• Knowledge of Human Culture and the Natural World (Knowledge)
• Creative and Critical Thinking (Skill)
• Effective Communication (Skill)
• Individual and Social Responsibility (Value)
• Respect for Diversity among People (Value)
• Integrative Learning (Skill)

Knowledge of the Natural World
Students will…

• Students will have a basic understanding of the behavior and distinguishing characteristics of metals, polymers, ceramics, semiconductors, and nanomaterials.
• Understand how material properties are affected by material size (that is, understand why nanomaterials have properties distinct from bulk properties)
• Understand how structure/property/processing relationships affect materials (e.g., impact of defects, molecular structure of polymers, impact of surfaces, etc.). [Related: Understand how a discrete bonding picture (interactions between atoms in solids and molecules) impacts the classes of materials and their behavior (e.g., metals, ceramics, polymers, semiconductors).]
• Understand the role of thermodynamics in determining the structure and chemistry of matter, and the limiting role of kinetics.
• Be familiar with the most common fabrication techniques for each class of materials.
  o Design relevant new materials based on latest technology or forecasted demand.
  o Appreciate contemporary challenges in modern materials science.
  o Understand (real) scientific practice and how to approach unsolved scientific problems.

Creative and Critical Thinking
Students will…

• Apply their knowledge of materials to new or different scenarios and circumstances
• Apply their knowledge to select appropriate fabrication (e.g., casting, melting, sintering, etc.) and synthesis (e.g., molecular reactions) methods in preparing materials or nanomaterials for study.
• Select from, and use, a wide array of instrumentation and techniques to characterize the physical and chemical properties of materials.
• Analyze and interpret data generated during synthesis and characterization
• Apply mathematics and natural science models for the analysis of materials.
Effective Communication

Students will…

- Understand the elements involved in giving an effective presentation (e.g., technology, speaking voice, correct terminology, appropriate dress).
- Understand the issues related to who the “receiving audience” is for a presentation.
- Be able to communicate findings about projects to a variety of audiences – other Materials Scientists, other scientists, other students, community members.
- Develop technical writing skills – present data in a customary manner to larger scientific audience.
- Be able to read the literature critically.

Individual and Social Responsibility & Respect for People

- Work effectively in a team setting
- Work effectively with others, treat others with respect, understand that others have different backgrounds.
- Scientific ethics – plagiarism, reproducibility, proper acknowledgement of contributors, responsible reporting of results; specific to Materials – ethical (e.g., safety, social, environmental) implications of material selection for product.

Other

- Appreciate the need for life-long learning for a successful career as a Materials Scientist.
- Be independent learners and workers; Develop self-reliance.
- Develop a plan for post-graduation: securing employment and/or educational opportunities.
- Is our curriculum current with respect to the Mat Sci field?