Title: 5A. Nanomaterials and Manufacturing

Goal: Provide an overview of a number of the manufacturing processes employed in building products that incorporate nanomaterials

Module Objectives: Create an understanding of manufacturing nanomaterials and of applying both these materials and naturally occurring nanomaterials in manufacturing.

Prerequisite by Topic:
- Introduction to Nanomaterials
- Basic Chemistry

Required Text: None
Reading: Write-up of this module
References: [Refs. 14-17, 21-24]

Student Learning Outcomes:
- Understand the concept of manufacturing nanomaterials
- Demonstrate understanding of actions required to ensure safe handling of nanomaterials
- Be able to respond properly in the event of a manufacturing issue
- Ensure that proper controls and record keeping is understood

Topics Covered: (Green highlighted topics are priority#1, Yellow highlighted are if time permits)

- Lecture I:
  - Manufacturing Nanomaterials for Industrial Applications
  - Control, Storage, and Recording
  - Naturally Occurring Nanomaterials
  - (Nano)Materials Safety Data Sheets
  - Med-Bio Nanomaterials Manufacturing
  - Environmental

- Lecture II:
  - Equipment Calibration
  - Metrology
  - Record Keeping
    - Medical Baseline & History
    - Training Records
    - Equipment Records
  - Safety Requirements
  - Emergency Procedures
Relationship to ABET Program Outcomes
[Note: Please, refer ABET program outcomes list (a) through (l) in attached standard template.]

(a) An ability to design and conduct experiments, as well as to analyze and interpret data
(e) An ability to identify, formulate, and solve engineering problems
(f) An understanding of professional and ethical responsibility
(h) The broad education necessary to understand the impact of engineering solutions in a
global societal context
(j) A knowledge of contemporary issues.