1. Course number and name
   EMA 4225 Mechanical Metallurgy
2. Credits and contact hours
   3 cr, 2.5 contact hours (2 hrs. 30 min. lecture)
3. Instructor's or course coordinator's name
   Instructor: Dr. Peter Kalu, Coordinator: Dr. William Oates
4. Text book, title, author, and year
   Mechanical Metallurgy, Dieter, G. E., 1986
5. Specific course information
   a. *brief description of the content of the course (catalog description)*
      This course focuses on tensile instability, crystallography, theory of dislocations, plasticity, hardening mechanisms, creep and fracture, electron microscopy, composite materials.
   b. *prerequisites or corequisites*
      Prerequisite: EML 3011C
   c. *indicate whether a required, elective, or selected elective course in the program*
      Selected Technical Elective course
6. Specific goals for the course
   This course is designed for advanced undergraduate or first-year graduate students interested in Materials Science, Metallurgy or related disciplines. The course is essentially concerned with two areas of material mechanical behavior: Elastic and plastic deformation. Special emphasis will be placed on the micromechanics of deformation and the structure of solids.
7. Brief list of topics to be covered
   - Review: Tensile Response of Materials
   - Effect of Temperature on Flow Properties
   - Stress State (2-D)
   - Stress Tensor
   - Stress State (3-D)
   - Description of Strain
   - Elasticity: Advanced Treatment
   - Plasticity: Yielding Criteria for Ductile Metals
   - Plastic Deformation
   - Dislocation Theory
   - Strengthening Mechanisms
   - Metalworking
   - Creep
   - Fracture