1. Course number and name
   EML 4221 Introduction to Physical Acoustics
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. Louis Cattafesta, Coordinator: Dr. Juan Ordonez
4. Text book, title, author, and year
   Fundamentals of Physical Acoustics, Blackstock, D. T., 2000
   a. *References:*
      - Acoustics : An Introduction to its Physical Principles and Applications, Pierce, A.D., 1989
      - Theoretical Acoustics, Morse. P.M., and Ingard, K.U., 1968
5. Specific course information
   a. *brief description of the content of the course (catalog description)*

      Solid and fluid continua. Cartesian tensor theory. Kinematics of infinitesimal deformation, relations between stress, strain, and strain rate for elastic, plastic, and viscous solids and for compressible and viscous fluids. General equations of continuum mechanics, integral forms, and their physical interpretation. Particular forms of equations and boundary conditions for elastic and viscoelastic solids and Newtonian fluids.
   b. *prerequisites or corequisites*
      Prerequisite: Instructor's permission
   c. *indicate whether a required, elective, or selected elective course in the program*
      Selected Technical Elective course
6. Specific goals for the course
   a. *Course Outcomes*
      Upon completion of this course, students should be able to demonstrate:

      1. A working understanding of the basic theory of physical acoustics
      2. An ability to solve engineering acoustics problems concerning wave theory for sound generation/radiation, propagation, dissipation, and scattering
      3. Make simple acoustic field measurements
   b. *Course Objectives and Relation to Student Outcomes*
      1. An ability to apply knowledge of mathematics, calculus based science and engineering to mechanical engineering problems
      2. An ability to identify, formulate, and solve engineering problems
7. Brief list of topics to be covered
   - Derivation of governing equations for wave theory of sound
   - Character of plane acoustic waves and 3-D acoustic fields
   - Sound transmission/reflection at an interface between two media
   - Waves transmission/attenuation in ducts
   - Low frequency approximations (lumped-element modeling)
   - Sources of sound
   - Introduction to radiation and scattering