

Introducing the ME Graduate Course

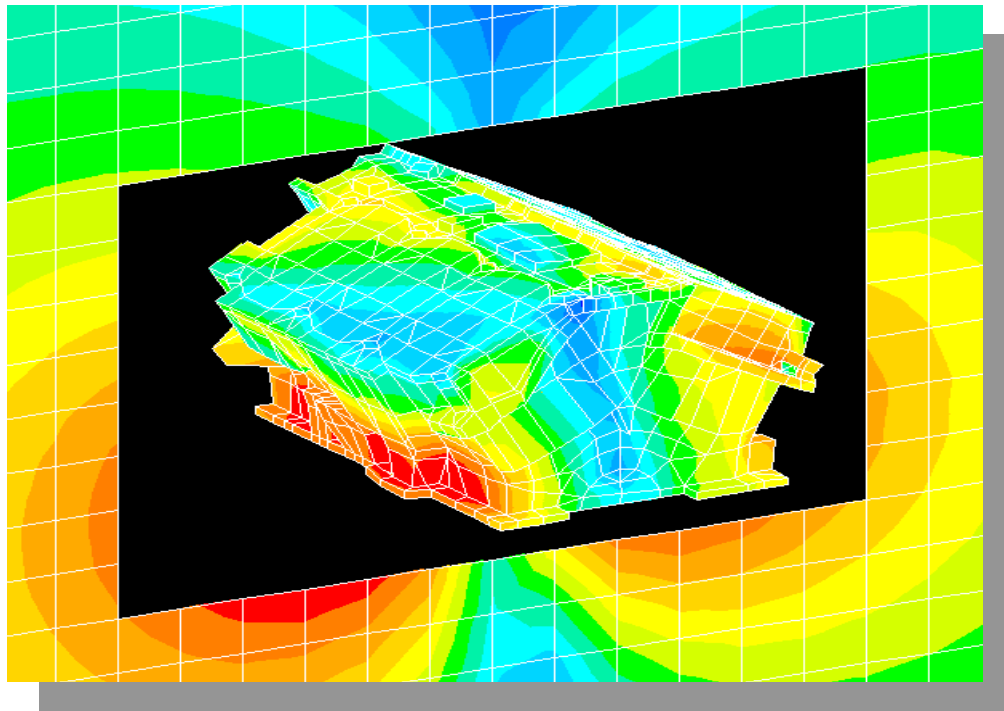
Boundary Element Methods I & II

(20-MECH-750 & 751)

Offered in Winter and Spring Quarters

Instructor: Dr. Yijun Liu, Associate Professor

The boundary element method (BEM), which uses a mesh only on the boundary of a problem domain, is a very efficient, accurate and emerging numerical method for many problems in engineering. It is also a good complement to the more general and well established finite element method (FEM). BEM has been used in the areas of heat transfer, stress analysis, structural optimizations, acoustics (e.g., noise control), dynamics, vibrations, electromagnetics and many other engineering applications. The basic ideas, formulations and software applications of the boundary element method will be presented in this course, as described in the catalog data shown below.



Sound Field On Surface Of A V-6 Engine Block
Calculated using the BEM software COMET/Acoustics ©AAC

Catalog Data (Course Descriptions):

20-263-750. Boundary Element Methods I. 3 gr. cr. Introduction to boundary element methods in heat conduction, elastostatics, acoustics and elastodynamics. Integral equation formulations, boundary elements, discretization and solution techniques. 3 lec.

20-263-751. Boundary Element Methods II. 3 gr. cr. Boundary element software applications and development in stress analysis, design optimizations and NVH (noise, vibration and harshness). Prereq.: 20-263-750. 3 lec.