Course:	**Math 854—Tensor Analysis with Applications**
Time:	Spring 2001, MW 7:05-8:20 PM, 211 NH
Instructor:	Tom DeLillo, 348 JB, 978-3974(office), 264-7806(home)
Email:	delillo@twsuvm.uc.twsu.edu
Office hours:	TTh 2:00-3:00 PM, most afternoons, or by appointment

Text: T. J. Chung, *Applied Continuum Mechanics*, Cambridge University Press (1996). A copy of the text is currently on reserve in the library.

Syllabus: Classical tensor analysis will be developed in the context of continuum mechanics. The partial differential equations of elasticity and fluid mechanics will be derived in Cartesian and curvilinear coordinate systems. Additional applications to a variety of other areas such as shell theory (see the books by Flügge and Green and Zerna, below), numerical grid generation, electromagnetism, general relativity, and other areas of mathematical physics and engineering may be considered, depending on the interests of the class.

Prerequisites: The course is self-contained, however the students should have some experience with vector calculus. Some knowledge of basic physics and differential equations will be helpful.

Grading: Grades will be based on homework problems and two or three exams. Students will have the option of pursuing special interests through team projects.

Additional References

J. Bonet and R. D. Wood, *Nonlinear continuum mechanics for finite element analysis,* Cambridge U. Press (1997). On reserve in library. Good for elasticity, dyadic notation, and computational methods.

W. Flügge, *Tensor Analysis and Continuum Mechanics*, Springer-Verlag (1972). This book is a good general supplementary reference. It is currently out of print. However, copies will be made available.

A. E. Green and W. Zerna, *Theoretical Elasticity,* Oxford U. Press (1968). The Dover edition of this book will be available in the bookstore as an optional supplementary text. The chapters on shell theory may be of particular interest here.

J. G. Simmonds, *A Brief on Tensor Analysis,* 2nd edition, Springer (1994).

Student Information - please return to me by next class.

Your name:

Your email address:

Your department:

Your major subject area:

Have you studied continuum mechanics?

What topics are you most interested in (check as many as you wish):

Elasticity

Fluids

Shell theory

Physics (e.g. general relativity):

Other:

Would you like to do a project?