Course Description:
This course is concerned with the description of material behavior. Specifically, after a quick review of finite kinematics, general principles, and balance equations, the general continuum theory of material behavior will be presented with special emphasis on Plasticity; Hyperelasticity and Viscoelasticity will also be briefly presented. As it will be argued during the course, these theories can be successfully utilized to characterize the complex behavior of a wide range of materials of practical interest including metals and polymers.

A second objective of this course is to teach students how to use the powerful software Mathematica to solve — by analytical and numerical means — problems in solid mechanics, as well as in other areas of engineering. The emphasis will be on problems involving tensor algebra and calculus, ordinary and partial differential equations, and asymptotic analysis.

Pre-requisites:
The formal pre-requisite for this course is MEC 536 (Mechanics of Solids).

Textbook:
There is no prescribed textbook for this course. Topics are drawn from various monographs, lecture notes, review articles, and research monographs (see list of references below).

Grading Policy:
Grades are based on scores from Homework (30%), a Final Exam (30%), and a Project (40%).

Instructor:
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Lectures:
Tuesdays 5:20-8:10 pm (Humanities 2045)

Office Hours:
Mondays 2:00-4:00 pm
Wednesdays 2:00-4:00 pm
List of References

Monographs


**Americans with Disabilities Act**
If you have a physical, psychological, medical, or learning disability that may impact your coursework, please contact Disability Support Services at (631) 632-6748 or http://studentaffairs.stonybrook.edu/dss/. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.sunysb.edu/ehs/fire/disabilities.shtml

**Statement on Academic Dishonesty**
Academic dishonesty is an extremely serious offense and will not be tolerated in any form. Academic dishonesty in general is the presentation of intellectual work that is not originally yours. Examples include, *but are not limited to*, copying or plagiarizing class assignments including homework, reports, designs, and other submitted materials; copying or otherwise communicating answers on exams with other students; bringing unapproved aids, either in physical (written) or electronic form to an exam; obtaining copies of an exam prior to its administration, etc. Academic dishonesty violates both the ethical and moral standards of the Engineering profession and all infractions related to academic dishonesty will be prosecuted to the fullest via the CEAS CASA committee. For you, the honest student, academic dishonesty results in lower class curves, hence a depression in your GPA and class standing, while cheapening the degree you earn.

**Allowed Calculators**
Following the Mechanical Engineering Department’s mandatory calculator policy, only the following calculators will be allowed to be used on the midterm and final exams. There will be no exceptions. This list of calculators is identical to that allowed for the National Council for Examiners for Engineering and Surveying (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as the Professional Engineering (PE) exam that you may take several years from now. The sooner you become comfortable on one of these calculators, the better. If you have any questions on this policy please feel free to contact me. The NCEES policy on calculators can be found here: http://www.ncees.org/exams/calculators/.

**Casio:**
All *fx-115* models. Any Casio calculator must contain *fx-115* in its model name.

**Hewlett Packard:**
The *HP 33s* and *HP 35s* models, but no others.

**Texas Instruments:**
All *TI-30X* and *TI-36X* models. Any Texas Instruments calculator must contain either *TI-30X* or *TI-36X* in its model name.