



Computational Mechanics Graduate Program

Course Syllabus: CMGP 06 Continuum Mechanics

Instructors: Dr. M. Neifar, Dr. K. Makhlouf

Course Outline:

1. Vector and Tensor Calculus
2. Stress : Cauchy and Piola stress tensors, Principle stresses and directions, Stress invariants
3. Deformation : Lagrangian and Eulerian tensors, Infinitesimal transformation case
4. Kinematics of Continua : Concept of continuum, Lagrangian and Eulerian descriptions
5. Basic Laws : Linear and Angular momentum, First and second Laws of Thermodynamics
6. Constitutive Equations : Elastic, Thermoelastic, Elastoplastic, Viscoelastic, Newtonian fluids.

Course Offering:

Quarter 1 of each academic year (Required Course; 45 hours total; 4.5 Credit hours)

Course Grade: Homework (30%); Exam (70%)

References:

- Frederick, D., Chang, T.S., "Continuum Mechanics", Scientific Publishers, 1972.
- Malvern, L.E., "Introduction to Mechanics of a Continuous Medium", Prentice Hall, 1997.
- Fung, Y.C., "A First Course in Continuum Mechanics", Prentice Hall, 1993.
- Mase, G.T., Mase, G.E., Mase, T.G., "Continuum Mechanics for Engineers, 2nd Edition", CRC Press. 1999.
- Salençon, J., "Handbook Of Continuum Mechanics: General Concepts, Thermoelasticity, Statics", Springer Verlag, 2001.