Georgia Institute of Technology
COE 3001 – Mechanics of Deformable Bodies

Text:

*Mechanics of Materials, by **James M. Gere** [or other editions, e.g., Timoshenko and Gere, etc.]*

Grades:

The first midterm accounts for 20%, the second midterm accounts for 25%, and the final exam accounts for 35%. Total Homework is 20%

Homework will be assigned every week. Students whose average falls between two grades may have their grades adjusted based on their performance on homework problems.

Course Content:

- **Introduction** (1.1-1.2)
- **Stress and Strain** (§1.3-1.9)
  - Definition of stress and strain Stress-strain diagrams
  - Elasticity, plasticity and Hooke's Law
- **Axial Deformation** (§2.1-2.7)
  - Deformation of axially loaded members
  - Statically indeterminate structures
  - Thermal deformation
- **Torsion** (§3.1-3.11, 12.6)
  - Torsion of circular bars
  - Torsion testing
  - Power transmission in circular shafts
- **Shear Force and Bending Moment Diagrams** (§4.1-4.5)
- **Stresses in Beams** (§5.1-5.10, 12.1-12.5, 12.7)
  - Normal stress in beams
  - Properties of sections
  - Shear stress in beams
  - Built-up beams
  - Unsymmetric bending
  - Principal stresses in beams
- **Combined Stresses** (§5.12, 8.5)
  - Beams under bending and axial loading
- **Stress and Strain Transformation at a Point** (§7.1-7.7, 8.1-8.4)
  - Principal stresses
  - Maximum shear stress
  - Mohr's circle
  - Membrane stresses, pressure vessels, and pipes
  - Principal strains, maximum shear strain

Beam Deflection (§9.1-9.5, 10.1-10.4)
- Curvature and beam deflection equation
- Boundary conditions
- Statically indeterminate beams
- Energy methods

Column Buckling (§11.1-11.6)
- Energy and equilibrium
- Buckling of columns with different boundary conditions
- Eccentric loading and imperfection
- Secant formula

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Honesty: The School of Aerospace Engineering values honesty and integrity of all members of our community. An important element of this value is the academic honor code.

Georgia Tech Honor Challenge Statement: I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community.

Honor Code: http://policylibrary.gatech.edu/student-affairs/academic-honorcode#Article_I:Honor_Agreement

Well-Being: The School of Aerospace Engineering values the complete well-being of all members of its community, which includes professional, physical, spiritual, emotional, and social dimensions. There are numerous resources to support the health and well-being of all members of our community: https://gatech.instructure.com/courses/108574

Mental Health Resources:
Emergencies: You can either Call 911 or call Campus Police at 404.894.2500http://www.police.gatech.edu/
Center for Assessment, Referral, & Ed. (CARE): https://care.gatech.edu/ 404.894.3498 (Counselor On-Call)
Counseling Center: https://counseling.gatech.edu/ 404.894.2575
Stamps Health Services: https://health.gatech.edu/404.894.1420
Student Life and Dean of Students: https://studentlife.gatech.edu/content/get-help-now 404.894.6367
Victim-Survivor Support (VOICE): https://healthinitiatives.gatech.edu/well-being/voice404-3854464/(or 4451)
National Suicide Prevention Lifeline: 1.800.273.TALK (8255)
Georgia Crisis and Access Line: 1.800.715.4225

Social Justice: The School of Aerospace Engineering values social justice for all members of the Georgia Tech community and the larger society. Social justice means that everyone's human rights are respected and protected. We stand committed in the fight against racism, discrimination, racial bias, and racial injustice. Our shared vision is one of social justice, opportunity, community, and equity. We believe that the diversity and contributions from all of our members are essential and make us who we are. We believe that our impact must reach beyond the classroom, research labs, our campus, and the technology we create, but must also improve the human condition where injustice lives. We will continue to work to understand, value, and celebrate all people and create an inclusive educational and work environment that welcomes all.

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