Syllabus for

PHYS 620 Continuum Mechanics

Fall 2020

Contact Information

- Day(s) and Time: *Wednesdays, 4:30 pm – 7:10 pm*
- Location: *Online*
- Instructor: Prof. Cing-Dao (Steve) Kan
- Email: cdkan@gmu.edu
- Phone: *703-993-5898*
- Office Hour: *Fridays, 10:30 am – 12:30 pm*
- Office: *Planetary Hall 105*

Course Prerequisites

PHYS 510 or permission of instructor

Course Description

Continuum Mechanics is a branch of mechanics that deals with the analysis of the kinematics and the mechanical behavior of materials modeled as a continuous mass rather than as discrete particles. In this course, students will learn mathematical foundations of continuum mechanics using vectors and tensors, properties and basic operations. The topics of kinematics of deformation, conservation laws, thermodynamics, stress, constitutive equations and elastic, viscous, and viscoelastic responses will be covered.

Text Book

"*Introduction to Continuum Mechanics*," 4th Edition, by W Michael Lai, David Rubin, and Erhard Krempl, published by Elsevier (*ISBN: 978-0-7506-8560-3*)

Topics to be covered

Week 1 – Introduction to Continuum Mechanics
Week 2 – Mathematical Foundation - Tensor Operations
Week 3 – Kinematics of a continuum
Week 4 – Displacement Field and Infinitesimal Deformation and Strain
Week 5 – Conservation of Mass and Compatibility Conditions
Week 6 – Principle of Linear and Moment of Momentum and Energy inequality
Week 7 - Stress and integral formulation of general principles
Week 8 – Elastic Solid
Week 9 – Midterm Exam
Week 10 – Equations of Infinitesimal Theory of Elasticity
Week 11 – Newtonian viscous fluid
Week 12 – Transport Theorem
Week 13 – Non-Newtonian fluid
Week 14 – Applications

Week 15 – Semester review

Grading Policy

- Homework 40%
- Midterm 25%
- Final 35%

Final Exam

TBD, Week of December 14, 4:30pm – 7:15pm

Gradin

- Exams: 60% - One midterm (25%) and one final (35%). You will be given review session to prepare for the exams.
- Homework: 40% - Usually one assignment per week.
- Course grade will be a letter grade. The following graduate grading is available at university catalog.

Grade	Quality Points	Graduate Courses
A+	4.00	Satisfactory/Passing
A	4.00	Satisfactory/Passing
A-	3.67	Satisfactory/Passing
B+	3.33	Satisfactory/Passing
B	3.00	Satisfactory/Passing
B-	2.67	Satisfactory/Passing
C	2.00	Unsatisfactory/Passing
F	0.00	Unsatisfactory/Failing

Academic Integrity

All students will be expected to abide by the Honor Code: Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work. GMU honor code is available at http://oai.gmu.edu/the-mason-honor-code-2/.

University Policy

The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/.

Disability Accommodations

If you have a learning disability or other condition that may affect academic performance, please:
a) Make sure documentation is on file with Office of Disability Services (SUB I, Rm. 4205; 993-2474; http://ods.gmu.edu) to determine the accommodations you need;
b) Talk with the instructor to discuss your accommodation needs.