

*Syllabus for*  
**PHYS 620 Continuum Mechanics**  
Fall 2022

**Information**

- Day and time of class: *Wednesdays, 4:30 pm – 7:10 pm*
- Classroom location: *Planetary Hall 220*
- Instructor: *Prof. Cing-Dao (Steve) Kan*
- Instructor email: [cdkan@gmu.edu](mailto:cdkan@gmu.edu)
- Instructor office hour: *By Appointment*
- Instructor office location: *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 Krempf, 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 30%
- Final 30%

**Final Exam**

*Wednesday, December 7, 2022, 4:30pm – 7:15pm*

**Grading**

- Exams: 60% - One midterm (30%) and one final (30%). 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:

- 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;
- Talk with the instructor to discuss your accommodation needs.