

Item	Detail(s)
CREDIT HOURS	3 Credit Hours
PREREQUISITES	Graduate Standing or Consent
COURSE DAY/TIME/LOCATION	
INSTRUCTOR	
E-MAIL	
OFFICE LOCATION	
OFFICE HOURS	

Optional Text

Mechanics of Structures: Variational and Computational Methods," Walter D. Pilkey and Walter Wunderlich, Second Edition, CRC Press, 2003.

Course Description

Governing equations of mechanics, energy and variational principles, variational methods of approximation, theory of elasticity, material laws, work and energy, beam theory, finite element method, structural systems.

Course Purpose

1. This course builds on the principles laid in the Mechanics of Materials undergraduate course. The theories of mechanics of elastic bodies will be explained in more details.
2. Energy methods, which presents a tool for deriving the equations of motion of elastic objects, will be emphasized.
3. The course will cover numerical methods to solve these equations also.
4. Students should be familiar with using MATLAB or similar tools.

Course Objectives

By the end of this course, you should be able to:

1. Students will be able to formulate of the linear problem of elasticity and provide a solution from simple problems
2. Formulate problems using the principles of virtual work and variational principles of elasticity
3. Students will be able to formulate derive the basic principles of the Finite Element Method (FEM/FEA)
4. Develop equations for vibration of simple structures
5. Write computer codes to analyze mechanical systems

Grading

Grades are based upon student performance on assignments.

Each assessment tool is weighed as follows:

45% Homework

5% Quizzes
5% Discussion Board Participation
45% Exams (All Equal Weight)

Course Policies

1. After each unit there will be a quiz.
2. Each quiz will have multiple questions.
3. These are concept questions that should take you no time to answer if you have watched the video or read my notes.
4. If you do not answer the questions correctly, it should be a signal that you have not fully understood a concept within the unit. In this case, please go back and review instead of just trying till you get the right answer!!!

3. The objective of exams is to test your understanding of material covered so far. Therefore, please do not expect to see one of the assignments problems, slightly masked, in the test. You should not also expect to see something totally new in an exam, as you will not have enough time to consider it.
4. My experience tells me that your chance of passing an exam is greatly enhanced if you solve assignments regularly.

Topics to be Covered

- Module 1: Equations for Linear Problems of Elasticity-I
- Module 2: Equations for Linear Problems of Elasticity-II
- Module 3: Linear Problems of Elasticity, Special Cases
- Module 4: Classical Structural Mechanics óI
- Module 5: Classical Structural Mechanics óII
- Module 6: Virtual Work ó I
- Module 7: Virtual Work óII
- Module 8: Approximate Methods in Elasticity ó I
- Module 9: Approximate Methods in Elasticity ó II
- Module 10: Approximate Methods in Elasticity ó III
- Module 11: Finite Element Method I, Fundamental and Bars under Axial Loading
- Module 12: Finite Element Method II, Beams in Bending
- Module 13: Finite Element Method III, Trusses
- Module 14: Finite Element Method IV, Frames
- Module 15: Finite Element Method V, Plane Stress
- Module 16: Dynamic Response

Public Health Directives

Face coverings are mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. [UNLV public health directives](https://www.unlv.edu/coronavirus/health-requirements) are found at <https://www.unlv.edu/coronavirus/health-requirements>. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the [UNLV Student Conduct Code](#), https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf, including being administratively withdrawn from the course.

Academic Misconduct

Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with WPNXú gf vecvkpcno kulkp. Ap gzco r rg qh ceef go ke o kueqpf wevku r rci kctkuo . Rrri kctkuo ku wukpi vj g words or ideas of another person, from the Internet or any other source without proper citation of the source(s). See the [Student Conduct Code](#).

Auditing Classes

Auditing a course allows a student to continue attending the lectures and/or laboratories and discussion sessions associated with the course, but the student will not earn a grade for any component of the course. Students who audit a course receive the same educational experience as students taking the course for a grade, but will be excused from exams, assessments, and other evaluative measures that serve the primary purpose of assigning a grade.

courses (except for modular courses), or within the first 7 calendar days of the course for Summer and modular courses, of their intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit the Missed Classwork policy, under Registration Policies, on the [Academic Policies](#).

In accordance with the policy approved by the Faculty Senate regarding missed class time and assignments, students who represent UNLV in any official extracurricular activity will also have the opportunity to make up assignments, provided that the student provides official written notification to the instructor no less than one week prior to the missed class(es).

The spirit and intent of the policy for missed classwork is to offer fair and equitable assessment opportunities to all students, including those representing the University in extracurricular activities. If a student is unable to attend class for an assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activities is not appropriate. The University will not assign a grade of zero for an excused absence for extracurricular activities. The student has the right to complete all work for the course.

This policy will not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the University that could be reasonably avoided. There should be a good faith effort by both the instructor and the student to agree to at could be

receive priority assistance. Students may make appointments in person or by calling the Center, telephone 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.

Diversity Statement

As an institution of higher learning, UNLV represents a rich diversity of human beings among its faculty, staff, and students, and is committed to aspiring to maintain a Campus environment that values that diversity. Accordingly, the University supports understanding and appreciation of all members of its community, regardless of race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity, marital status, pregnancy, genetic information, veteran status, or political affiliation. Please see [University Statements and Compliance](https://www.unlv.edu/about/statements-compliance), <https://www.unlv.edu/about/statements-compliance>.

A successful learning experience requires mutual respect and trust between the students and the instructor. Aeeqtf kpi n{, vj g kputwexqt cumu vj cvuwf gpw dg y knkpi vq rkvgp vq qpg cpqj gtø r qløvu qhxky , acknowledging that there may be disagreements, keep discussion and comments on topic, and use first person, positive language when expressing their perspectives.