**Department of Mechanical and Mechatronic Engineering and Sustainable Manufacturing**

**Catalog Description:** Free and forced vibrations of lumped parameter systems, transient vibrations, systems with several degrees-of-freedom.


**Office:** OCNL 418, 530.898.6353, RVarahamurti@csuchico.edu

**Prerequisites:** MECH 320

**Course Objectives:**

To learn to model, analyze, and predict the performance of mechanical vibration.

Coverage includes the following topics:

1. Description of vibrational motion
2. Modeling and analysis of one degree of freedom
3. Resonance, Bandwidth and Base Excitation
4. General Forced Response
5. MATLAB Applications
6. Modeling and analysis of two degree of freedom systems
7. Vibration Suppression and Control
8. Matrix Methods for Multi-degree of freedom systems
9. Vibration Measurement
10. Distributed Systems
11. Dynamic Finite Element Analysis

**Grading Policy**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>5%</td>
</tr>
<tr>
<td>Exams</td>
<td>60% (2 to 4)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35%</td>
</tr>
</tbody>
</table>

**Grading Ranges:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-</td>
<td>90 – 100%</td>
</tr>
<tr>
<td>B-</td>
<td>75 – 89.99%</td>
</tr>
<tr>
<td>C-</td>
<td>60 – 74.99%</td>
</tr>
<tr>
<td>D-</td>
<td>50 – 59.99%</td>
</tr>
<tr>
<td>F</td>
<td>Below 49.99%</td>
</tr>
</tbody>
</table>

**Note:** Late work will not be accepted.

**Homework:** Homework is due at the beginning of class. Homework problems will be assigned from the chapters after the coverage of the topics.

**Exams:** There will be in-class exams. Each successive exam may include prior course material. Exam dates will be announced in class along with your responsibility.

**Plagiarism:** Copying is plagiarism and will not be tolerated. Such incidences are referred to the student judicial affairs and may result in expulsion from the University. Refer to Students Rights and Responsibilities section of the University Catalog, or ask the student judicial affairs about a specific situation.
Reference:

Note: Review differential equations.

University Policies and Campus Resources

Academic Integrity
Students are expected to be familiar with the University’s Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Judicial Affairs. The policy on academic integrity and other resources related to student conduct can be found on the [Student Judicial Affairs web site](#).

IT Support Services
Computer labs for student use are located on the first and fourth floor of the Meriam Library, Room 116 and 450, Tehama Hall Room 131, and the Bell Memorial Union (BMU) basement. You can get help using your computer from IT Support Services; contact them through the [ITSS web site](#). Additional labs may be available to students in your department or college.

Student Services
Student services are designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. Students can find support for services such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. Student services information can be found on the [current students page of the CSU Chico web site](#).

Americans with Disabilities Act
If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

[Accessibility Resource Center](#)
530-898-5959
Student Services Center 170
[arcdept@csuchico.edu](mailto:arcdept@csuchico.edu)

Student Learning Center
The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners. The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The University Writing Center has been combined with the Student Learning Center. You can also visit the [Student Learning Center web site](#).