San José State University
Mechanical Engineering Department
ME 147-01 Dynamic Systems Vibrations and Control, Spring 2020

Course and Contact Information

Instructor	Dr. Feruza Amirkulova
Office Location	Engineering Building, Room 310J
Telephone	(408) 924-2045
Email	feruza.amirkulova@sjsu.edu
Office Hours	Monday, Wednesday 3:15pm – 4:15 pm in E310J
Class Days/Time	Monday, Wednesday 10:30AM - 11:45AM
Classroom	E303
Prerequisites	Grade of "C-" or better grade in ME 130 (undergraduate students only)

Course Format
The course relies on lecture materials presented in class and students are strongly encouraged to attend.

Course Materials
Copies of the course materials including the syllabus, homework solutions, slides, and MATLAB codes will be available on course webpage at Canvas. Class participation and attendance are strongly encouraged. Students are encouraged to attend all classes, participate in group problem solving activities, and take class notes to support their reading assignments.

Course Description
Mathematical repren4(n)-9s612 p

Required Text/Readings

Textbook (required)
Mechanical Vibration: Analysis, Uncertainties, and Control *by Haym Benaroya, Mark Nagurka, Seon Han. 4th Edition. CRC Press, 2017, 579 Pages, ISBN 9781498752947,* electronic book is available at our SJSU library.

Other
1) **Engineering Vibrations**, *William J. Bottega, Second Edition, CRC Press/Taylor & Francis Group, 2015,* electronic book is available at our SJSU library.
2) **Dynamic Systems Vibration and Controls** *by F. Barez*, Spring 2020, available at Maple Press
3) **Textbook Of Mechanical Vibrations**, *Rao V. Dukkipati and J. Srinivas, (Kindle pdf version).*
4) **Schaum's Outline of Theory and Problems of Mechanical Vibration,** *S. G. Kelly, McGraw-Hill, 1996*
5) **Automatic Control Systems**, *Farid Golnaraghi, Benjamin C. Kuo. 2017 Tenth Edition. ISBN: 9781259643835.*

Course Requirements and Assignments
Homework will be assigned weekly as a set and is due on the Wednesday of each week following the week assigned.

Final Examination or Evaluation
The final exam will be comprehensive, covering all material presented in class. There will be no make-up quiz. There will be no make-ups for missed exams, except for medical or other reasons outside the student's control, and such must be documented with a written notice. The lowest quiz grade will be dropped.

Grading Information
Course grade will be based on homework assignments, exams.

Homework	10%	Due on Wednesday before lecture
Quizzes	15%	

Class Protocol

Class participation and attendance are strongly encouraged. Use of cell-phones is not allowed except during taking quizzes using iClicker (see https://www.iclicker.com/students for instructions). Laptop

ME 147 Dynamic Systems Vibration and Control
Spring 2020 Course Schedule/Outline

Week	Date	Lecture Topics	Quizzes and Exams
1	01/27	Course organization. Principles of Mechanics. Intro to Vibrations. Degree of Freedom	
1	01/29	Equation of Motion. Natural Circular Frequency. Period of Oscillations. Free Vibrations	
2	02/03	Free Vibrations of Single Degree of Freedom System (SDFS). Unamped Systems	
2	02/05	Energy Method. Unamped Systems	
3	02/10	Free Vibrations of Damped Systems	

Week	Date	Lecture Topics	Quizzes and Exams
13	04/20	Time Domain Analysis. Transient and Steady-State Responses	
13	04/22	Time Domain Analysis. Transient and Steady-State Responses.	Quiz-5 (20 min)
14	04/27	State-Variable Method. Controller Types and Control Laws. Controller Design	
14	04/29	State-Variable Method. Controller Types and Control Laws. Controller Design	
15	05/04	Frequency Analysis. Nyquist plots	
15	05/06	Frequency Analysis. Nyquist plots. Bode Diagrams, and Gain and Phase Margins	Quiz-6 (20 min)
16	05/11	Bode Diagrams, and Gain and Phase Margins	
Final Exam	05/15	**In class** at **09.45am - 12.00pm**	**Final Exam** (2 hours and 15 min)

NOTE: This is not a firm list. There may be additions or deletions during the semester