

# **CE459**

# Course Syllabus

July 2022

# Part I Course Organization

## CE459 Introduction to Structural Dynamics (2units)

Lecture (2): WPHB30	Mon 11:00am-12:50pm	Wed 11:00am-12:50pm	29609R DRB146
Discussion (1)	Fri 2-2:50pm		29613R GFS207
Professor	Vincent Lee		
Office	KAP230B		
Phone	213-7400568		
Email	Through <a href="https://blackboard.usc.edu">https://blackboard.usc.edu</a> and <a href="https://piazza.com">https://piazza.com</a>		
Office Hours	TBA through Piazza		
Teaching Assistant	TBD		
TA Office Hr	online tba		
Email	Through <a href="https://blackboard.usc.edu">https://blackboard.usc.edu</a> and <a href="https://piazza.com">https://piazza.com</a>		
Office Hours	TBA 1 <sup>st</sup> week of class to last week of class		
Prerequisites	CE458		
Textbook(s)	Anil Chopra, "Dynamics of Structures: Theory and Applications to Earthquake Engineering," Fifth Edition, Pearson, 2017		
Course Descriptions	Response of single and multiple degree of freedom systems to dynamic excitation; structural modeling and approximate solutions; introduction to earthquake resistant design.		
Course Objectives and Outcomes	<p><b>Learning Objectives and Outcomes</b></p> <p>By the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Derive the equations of motion of single-degree-of-freedom (SDOF) systems under arbitrary dynamic loads</li> <li>2. Apply different analysis techniques to solve the governing equations of motion</li> <li>3. Determine the response of SDOF systems to harmonic, periodic, and pulse excitations</li> <li>4. Use efficient computational approaches for evaluating dynamic response of linear systems</li> <li>5. Implement computer methods for solving nonlinear differential equations for the response of nonlinear structures.</li> <li>6. Learn the fundamental concepts of earthquake response of linear systems.</li> <li>7. Interpret design code requirements for structures under earthquake loads.</li> </ol>		
Assignments	Online weekly HW Assignments		
Late work, Make-up work, Incomplete work		All with Partial Credit	
Final grade schema is based on the following percentages of graded coursework :			
Homework	20%		
Mt#1,2	24,24%		
Final	32%		
Total	100%		

## CE459 Introduction to Structural Dynamics Fall 2022 Class Schedule

	Topics/Daily Activities	Readings and Homework	Deliverable/ Due Dates
<b>Week 1</b> Aug 23	Introduction: SDOF: Single degree of freedom system-	Chopra Chap 1,2	HW Assigned on Thursday, due Thursday next week
<b>Week 2</b> Aug 30	SDOF: damped and undamped Free Vibration cont.	Chopra Chap 2	HW
<b>Week 3</b> Sep 6	SDOF: Response to Harmonic and Periodic Excitations	Sep 6 Mon: Labor Day	HW
<b>Week 4</b> Sep 13	SDOF: Response to Harmonic and Periodic Excitations, Cont.	Chopra Chap 3	HW
<b>Week 5</b> Sep 20	SDOF: Response to Arbitrary, Step & Pulse Excitations	Chopra Chap 4	HW <span style="background-color: #00FFFF;">Sep20 MT#1 (1 hr)</span>
<b>Week 6</b> Sep 27	Response to Arbitrary, Step & Pulse Excitations, cont..	Chopra Chap 4	HW
<b>Week 7</b> Oct 4	Numerical Evaluation of Dynamic Responses	Chopra Chap 5	HW
<b>Week 8</b> Oct 11	Numerical Evaluation of Dynamic Responses, cont.	Chopra Chap 5	HW
<b>Week 9</b> Oct 18	Earthquake Responses of Linear Systems	Chopra Chap 6	HW
<b>Week 10</b> Oct 25	EQ Responses of Linear Systems; Response Spectra	Chopra Chap 6	HW <span style="background-color: #00FFFF;">Oct25 MT#2 (1hr)</span>
<b>Week 11</b> Nov 1	Generalized Single-Degree-of-Freedom Systems	Chopra Chap 8	HW
<b>Week 12</b> Nov 8	Generalized Single-Degree-of-Freedom Systems, cont.	Chopra Chap 8	HW
<b>Week 13</b> Nov 15	MDOF: Multi-Degree-of-freedom System , Equations of Motions	Chopra Chap 9	HW
<b>Week 14, 15</b> Nov22	MDOF: free Vibration	Chopra Chap 9, 10	Happy Thanksgiving!
<b>Week 15</b> Nov29	MDOF: free Vibration, cont.	Chopra Chap 10	
<b>FINAL</b>		Stay Healthy!	<span style="background-color: #00FFFF;">Dec 7 Wed 11am-1pm Final</span>

## STATEMENT ON ACADEMIC INTEGRITY

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own.

All students are expected to understand and abide by these principles. *SCampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:

<http://www.usc.edu/dept/publications/SCAMPUS/gov/>

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at:

<http://www.usc.edu/student-affairs/SJACS/>

## STATEMENT FOR STUDENTS WITH DISABILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible.

### ***DSP Contact Information***

<b>OFFICE LOCATION</b> STU301	<b>HOURS OF OPERATION</b> 8:30 a.m.until5:00p.m.,MondaytoFriday	<b>PHONE NUMBER</b> (213)740-0776
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