Carleton University

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Engineering CIVE 5106 F Dynamics of Structures

September 2020 Lectures: 3 hours/week On-line
6:00 pm to 8:55 pm

Classes begin Sept 9, 2020
Zoom Meeting ID 930 4369 0685
Password CIVE5106

WEEK	**TOPIC**
1 - 2	Objectives of dynamic response analysis; types of loading; methods of discretization. Formulation of the equations of motion for single degree-of-freedom systems; rigid body assemblage, systems with distributed flexibility.
3 -4	Single degree-of-freedom systems. Free vibration response; damped and undamped systems. Response to harmonic loading; resonant response. Measurement of Damping. Transmissibility and isolation.
5 - 6	Single degree-of-freedom systems. Response to arbitrary loading. Analysis by Rayleigh method. Numerical methods of response analysis.
7	Multi degree-of-freedom systems. Formulation of the equations of motion, evaluation of structural property matrices.
8 - 9	Multi degree-of-freedom systems. Free vibration analysis. Frequencies and mode shapes; solution of the eigenvalue problem (iteration methods).
10-11	Multi degree-of-freedom systems. Analysis of dynamic response, normal coordinates, mode superposition method.
12	Multi degree-of-freedom systems. Numerical methods of response analysis including Rayleigh Ritz method and selected methods of direct integration.

TEXTS

l Humar, J.L. Dynamics of Structures, 3rd Edition, CRC Press, Taylor & Francis Group, 2012

REFERENCES

1. Chopra, A.K. Dynamics of Structures, 4th Edition, Prentice Hall, 2012
2. Paultre, P. Dynamics of Structures, Wiley, 2010
3. Craig, R.R. Jr, Kurdila, A.J. fundamentals of Structural Dynamics, 2nd Edition, Wiley, 2006
4. Clough, R.W. and Penzien, J. Dynamics of Structures, McGraw-Hill, 1993

DISTRIBUTION OF MARKS

Assignments	50%
Final Examination	50%

Accomodation

"The Paul Menton Centre for Students with Learning Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your ***Letter of Accommodation*** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*). "

Instructor: Prof. J.L. Humar