CARLETON UNIVERSITY

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

CIVE 5104 **Winter 2022**

Earthquake Engineering and Analysis

Course Outline

1. Multi-degree-of-freedom (MDOF) Systems:

    - Review (optional): equation of motion; eigenvalue problem, frequencies, mode shapes; mode supervision method etc.
    - Eigenvalue problem: influence of axial forces
    - Mode superposition: static correction; mode acceleration
    - Derived Ritz vectors (Lanczos coordinates)

2. Analysis of Structural Response to Earthquake:
    - Deterministic analysis of earthquake response, excitation by rigid-base translation or rotation
    - Earthquake forces in building codes
    - Response spectra: elastic and inelastic response spectra
    - Multiple support excitation

3. Response Analysis via Frequency Domain
4. Concepts and Practices of Earthquake Response Analysis and Design for Buildings and Bridges

5. System Identification Techniques for Structural Health Monitoring and Evaluation

Grades:	Project	50%
	Research paper	30%
	Presentation	20%

Course Instructor: D.T. Lau, Room 3436ME