ADVANCED DYNAMICS and STRUCTURAL CONTROL

Instructor: **Prof. Panos Tsopelas,** *tsopelas@central.ntua.gr*
Class: Wednesdays 2:10-4:40 p.m. at
Office Hours:-

Textbook: NO Textbook
Recommended Reading:

1) R.W. Clough and J. Penzien, Dynamics of Structures, McGraw Hill, 2nd Edition, 1993.
2) A. K. Chopra, *Dynamics of Structures*, Prentice Hall, 1st Edition, 1995.
3) J. T. Katsikadelis, *Dynamic Analysis of Structures*, Academic Press; 1st edition (2020), (ISBN 978-0128186435)
4) T.T. Soong and M.C. Constantinou *"Passive and Active Structural Vibration Control in Civil Engineering,"* Springer-Verlag, Wien-New York, 1994.
5) R.I. Skinner, W.H. Robinson and G.H. McVerry, "*An introduction to Seismic Isolatio*n," J Wiley, 1993
6) J.M. Kelly, "*Earthquake-Resistant Design with Rubber*," Springer-Verlag, London, 1993
7) F. Naeim, J. M. Kelly "*Design of Seismic Isolated Structures : From Theory to Practice*,", J. Wiley; 1999.
8) F. Naeim, *The Seismic Design Handbook*, Van Nostrand Reinhold.

CONTENTS

- Introduction, Review of Structural Dynamics
- Analysis in Frequency Domain
- Dynamics of continuous Systems (Hamilton;s principle, Equations Lagrannge
- Dynamics and Analysis of Non-Linear SDOF Systems
- Introduction to Structural Control (Seismic isolation Principles, History)
- Seismic Isolation Systems (Elastomeric, Sliding, Rocking, Others)
- Elastomeric Isolation Systems LRB, HRB (Low Damping, High Damping Rubber Bearings)
- Linear Theory of Base Isolation
- Sliding Isolation Systems
- Energy Dissipation Systems
- The principle of Active Structural Control
- Theoretical and Practical Considerations