Mechanical vibration B

Finalità
The course gives the basics for the theoretical and experimental vibration analysis of continuous systems.

Programma
Vibrations of continuous systems: local and global discretization (Rayleigh-Ritz, Galerkin, FEM); vibrations of beams and thin-walled structures.
Introduction to large-amplitude vibrations and nonlinear phenomena.
Stability problems of systems with fluid-structure interaction: flutter and divergence of aeronautical and aerospace structures.
Applications to actual problems.
Experimental modal analysis on structures with high modal density.

Attività d'esercitazione
Laboratory experiences: experimental modal analysis of thin panels.

Modalità d'esame
Written exam on the program that can be integrated with assignments and reports of laboratory experiences.

Testi consigliati
Notes given by the teacher.
W. SOEDEL, 1993, Vibrations of shells and plates, Marcel Dekker, New York.
M. P. PAÏDOUSSIS, 2004, Fluid structure interactions Vol. 2, Academic Press/Elsevier.
M. AMABILI and R. GARZIERA, 2000, Journal of Fluids and Structures, Vol. 14, No. 5, pp. 669-690. Vibrations of circular cylindrical shells with nonuniform constraints, elastic bed and added mass; Part I: empty and fluid-filled shells.