

CODE CEB3561		DYNAMICS			
Language: English			Course: Basic/Advanced		
Year (II), semester (3)		Level: II		Obligatory/Optional	
Prerequisites: Strength of the materials. Introduction to dynamics. Structural mechanics			Teaching: Traditional/Distance L.		
Lecturer: Zbigniew Wójcicki, PhD, DSc, Jacek Grosel, PhD					
	Lecture	Tutorials	Laboratory	Project	Seminar
Hours / sem. (h)	30	30	15		
Exam / Course work:	E	Mark	Mark		
ECTS	2	2	1		
Workload (h)	60	60	30		

Outcomes: Competence in structure elements calculations, dynamic load and resonance occurrence prediction. Application of principles of dynamics to the analysis of the motion of systems consisting of material points and stiff solids.

Content: Principle of Dynamic (Newton's Law of Motion, D'Alembert's Principle), Degrees of Freedom, Springs in parallel or in series, Solution of the Differential Equation of Motion, Amplitude of Motion, Undamped Single Degree-of-Freedom Systems (SDOF), Damped Single Degree-of-Freedom Systems (Viscous Damping, Equation of Motion, Critically Damped System, Overdamped System Underdamped System, Logarithmic Decrement), Response of SDOF System to Harmonic Load Undamped and Damped Systems. Kinematically forced vibrations. Inertia excited vibrations. Multi-Degree-of-Freedom MDOF systems Eigenproblem (eigenvalues and eigenvectors). Eigenproblem (eigenvalues and eigenvectors). Natural Frequencies and Normal Modes, Orthogonality Property of the Normal Modes, Reductions of Dynamic Matrices, Static and Dynamic Condensation.

Literature:

www.iil.pwr.wroc.pl/wojcicki

1. Paz M., Leigt W., Structural Dynamics. Theory and Computation, 5th edition, Springer, 2004

