SUBJECT PRESENTATION FORM

Subject name	Structural Dynamics
Field of study	Civil Engineering
Main field of study	CCIA
Subject code	41323208
Subject main teacher	Prof.dr.ing. Pavel ALEXA – pavel.alexa@staff.utcluj.ro
Colaborators	Ovidiu PRODAN
Department	Structural Mechanics
Faculty	Civil Engineering

Sem.	Type of subject	Course	Applications			Course	Applications			Individual Study	TOTAL	Credits	Type of examination
		[classes/week]				[classes/semester.]							
		C	S	L	P	C	S	L	P				
2	**Fundamental**	**2**	**1**	**-**	**-**	**28**	**28**	**-**	**-**	**22**	**78**		**Exam**

Achieved abilities:
Theoretical knowledge, (What the students must know)
Knowledge of Structural analysis Knoledge of differential equations
Achieved skills: (What they can do)
Modal analysis of skeletal structures Dynamic analysis of skeletal structures
Achieved abilities: (What types of equipments and instruments they know how to use)
Application of modal and dynamic analysis to frame type structures

Previous requirements (if necessary)
- Structural analysis - Differential equations

A. Course (course titles +curriculum)	
1; 2	Dynamic actions Elastic properties of frame type structures About damping (viscous); About d.o.f.
3; 4	Free vibrations of one d.o.f. structures
5	Dynamic response of one d.o.f. structures to general dynamic forces
6	Dynamic response of one d.o.f. to sinusoidal forces
7	Damping in free and forced vibrations of one d.o.f. structures
8	Lateral stifness matrix of frame type structures
9	Differential equation of free and forced vibrations of multi d.o.f. structures
10	Modal analysis (free vibrations) of multi d.o.f. frames – direct method
11	Modal analysis (free vibrations) of multi d.o.f. frames – matrix itteration
12; 13	Dynamic response of multi d.o.f. frames
14	Seismic response of mulit d.o.f. frames

B1. Applications – **WORKS** (list of works, tutorial works, contents of the year end project)	
1	Elastic properties of one d.o.f. structures: stiffness coefficent; flexibility coefficient
2	Stiffness matrix of the laboratory study case (two story steel frame)
3	Lateral stiffness matrix of the labotory study case
4	Inertia and damping matrices of the laboratory study case
5	Free vibrations of the laboratory study case – direct method
6	Free vibrations of the laboratory study case – matrix itteration
7	Dynamic response of laboratory study case

B2. Laboratory room (Room/surface, address) 108/58m^2 , str. Daicoviciu nr.15, clăd.V/turn, et.1; 504/58m^2		
Equipment	Equipment description	Year of purchase
Computers : Room 108: 14 pcs.	PC- Procesor Pentium IV/3GHz/Mem.1024MB/ HDD 200GB/DVD-RW/Monitor TFT 19”/Tast.+Mouse;	2006

C. Individual study (topics of the bibliographical studies, summarized materials, projects, applications etc.)

1. Differential equations
2. Displacement method in structural analysis

Structure of the Individual study	Course study	Solving homeworks, labs, projects	Training, applications	Time alloted for examinations	Bibliographical supplementary study	Total number of classes for individual study
No. of classes	7	5	5	2	3	22

D. Teaching methods and strategies

Classical method and internet
Interactive lectures
The applications and laboratorywork aiming at building up engineering thinking in Dynamics.
Weekly group and individual office hours

Bibliography

1. Lecture notes

In UTC-N library

2. G. M. Barsan : Dinamica si Stabilitatea Constructiilor
3. Anil K. Chopra: Dynamics of Structures: Theory and Applications to Earthquake Engineering

Multimedia teaching aids

4. Internet – Java animations of structural vibrations

In other libraries

5. -

Examination and grading procedure	
Examination procedure	Exam: written paper (1 hour – theoretical part; 2 hours - applications) Laboratory work – 40% of the total / final mark.
Components of the grade	Theory (nota T); Application (nota A); Tutorial (nota L)
Formula for calculating the grade	N=0,3T+0,3A+0,4L; Credits: T≥4,5 şi A≥4,5 şi L≥4,5

Subject coordinator,
Prof.dr.ing. Pavel ALEXA