

DEPARTMENT OF CIVIL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	Elementary Structural Dynamics		
Course Code	CEPE11	No. of Credits	3
Course Code of Pre-requisite subject(s)	CEPC10		
Session	July. 2018	Section (if, applicable)	A
Name of Faculty	Dr. P. A. Krishnan	Department	Civil Engineering
Email	pak@nitt.edu	Telephone No.	8129769531
Name of Course Coordinator(s) (if, applicable)	-----		
E-mail		Telephone No.	
Course Type	Core course		
Syllabus (approved in BoS)			
<p>Dynamic Analysis-Elements of vibratory systems and Simple Harmonic Motion. Free vibration of SDOF systems; undamped and damped systems. <i>Viscous damping and Coulomb damping</i>. Evaluation of damping Forced vibration of undamped and damped systems-Structures subjected to harmonic loads Resonance condition. Dynamic amplification factors. General types of loads-Duhammel integral approach to solution. Free vibration analysis using Rayleigh's method Differential equation of motion-Thin Beam flexural vibration analysis-Beam functions. Free vibration of MDOF systems-Solution of the eigenvalue problem-Iteration due to Holzer and Stodola. Idealization of multi-storeyed buildings-lumped systems.</p>			
COURSE OBJECTIVES			
1. To introduce the concepts of dynamic systems			
2. To study the dynamic response of SDOF			
3. To study the dynamic response of MDOF			
4. To introduce continuous systems subjected to different types of dynamic loads			
5. To learn free and forced vibration response of structural systems			

COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
On completion of the course ,students will be able to	
1. apply the concepts of dynamic systems	
2. identify, formulate and solve dynamic response of SDOF	
3. identify, formulate and solve dynamic response of MDOF	
4. analyze continuous systems subjected to different types of loads	
5. identify, formulate and solve free and forced vibration response of structural systems.	

COURSE PLAN – PART II			
COURSE OVERVIEW			
<p>This subject discusses about elementary concepts in dynamic analysis of structural systems..</p> <p>Free vibration of SDOF (both damped and undamped) will be discussed. In damping, viscous damping as well as coulomb damping will be discussed.</p> <p>Also forced vibration will be discussed.</p> <p>Different types of loadings will be considered.</p> <p>Different types of approaches to forced response will be discussed.</p> <p>Continuous systems like beams will be discussed.</p> <p>Free vibration of MDOF systems will be discussed.</p> <p>Different eigensolution techniques will be considered.</p> <p>Multi-storeyed buildings under free vibration will be discussed.</p>			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	First 1- 3 weeks	Development of equations of dynamic analysis for SDOF systems ;free vibration of undamped systems and examples ; free vibration of viscous damped systems and examples	Chalk/PPT
2	4 th and 5 th week	Forced response of SDOF systems under dynamic harmonic loads . Transmissibility of Forces and displacement; Vibration isolation	Chalk/PPT
3	6 th to 8 th week	Forced response of SDOF systems subjected to general loads- Duhammel integral approach	Chalk/PPT

4	8 th to 10 th week	Free vibrations using Rayleigh's method for continuous as well as lumped systems.	Chalk/PPT
5	11 th and 12 th week	Free vibration of MDOF systems; eigenvalue solutions; different methods; power method; Iteration method due to Holzer and Stodola	Chalk/PPT
6	13 th and 14 th week	Multi-storey building free vibration analysis	Chalk/PPT

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	At the end of 5 th week	1 hour	20
2	Cycle Test 2	At the end of 10 th week	1 hour	20
3	Quiz	At the end of 12 th week	1 hour	10
4	Semester Exam.	At the end of 16 th week	3 hours	50
CPA	Compensation Assessment*	15 th Week	1 hour	20
5				
6	Final Assessment *	At the end of 16 th week	3 hours	50

*mandatory; refer to guidelines on page 4

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc) Email : pak@nitt.edu

ATTENDANCE Min. attendance as per Institute norms

COMPENSATION ASSESSMENT Only on genuine grounds

ACADEMIC HONESTY & PLAGIARISM No mobile phones inside the class room.
Discipline to be maintained in the class room.

ADDITIONAL INFORMATION

FOR APPROVAL

Course Faculty 

CC-Chairperson 

HOD 

Guidelines:

- a) The number of assessments for a course shall range from 4 to 6.