GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology		Branch/Spec.	Civil Engineering	
Semester	VIII		Version	2.0.0.0	
Effective from Academic Year	2019-20		Effective for the batch Admitted in	2014-15	
Subject code	2CI813	Subject Name	**Elective Paper – II (Design of Earthquake Resistant Structures-II)**		

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3		1		4	Theory	40	60	100
Hours	3		2		5	Practical	35	15	50

Pre-requisites:

Elective Paper – I (Design of Earthquake Resistant Structures-I)

Learning Outcome:

After Completion of the Curriculum of Design of Earthquake Resistant Structure - II students can get knowledge of multi degree freedom system under lateral forces. They are also able to calculate the mode shape under lateral force and centre of mass and stiffness of the structure.

Theory syllabus

Unit	Content	Hrs
1	**Structural dynamics** Introduction to multi degree of freedom system- continuous mass v/s lumped mass, natural frequencies and mode shapes, Response spectrum analysis, modal analysis & time history analysis, Dynamics related to machine foundation.	12
2	**Design of Multi storeyed Buildings:** Design of multi-storeyed building (G+10) for various forces including earthquake & wind forces: Loads as per IS 875 & IS: 1893-2002 (Part I), Load combinations as per IS: 875 (Part V), Ductile detailing of RC building as per IS: 13920 1993	12
3	**Retrofitting and strengthening.** Introduction, Essentials of seismic design of RCC and masonry buildings, Condition assessment of existing buildings, Goals and objectives of seismic Retrofit, Retrofit versus repair and rehabilitation, Steps of seismic retrofit, Retrofit of RCC building, Retrofit of Foundations	7
4	**Advances in Earthquake Engineering** Structural control: Response of various Passive controls like Base Isolation System & various dampers, Active control, Semi-active control, Hybrid control.	4
5	Seminar based on topics related to syllabus	4

Practical content	
Term work shall consist of Seismic design of RC multi-storey frame building with ductile detailing in A3 CAD drawings, ERD of elevated water tank/ ERD of chimneys & silos. At least 10 problems along with theory based on the course. Preparation of various models of structural systems OR seminar/project	
Text Books	
1	PankajAgarwal, Manish Shrikhande "Earthquake Resistant Design Of Structures" PHI Learning Pvt. Ltd., 2006 - Technology & Engineering
2	A.K.Chopra, "Dynamics of structures" Theory Application to earthquake engineering, Prentice Hall of India Pvt Ltd., New Delhi.
3	Clough & Penzin; Dynamics of structures
Reference Books	
1	S.K.Duggal, "Earthquake Resistant Design Of Structures" Oxford publication.
2	Paz Mario "Dynamics of structures", Mac Grawhillinc.
3	AmarnathChakrabarti, CPWD, IBC & IIT madras "Handbook on Seismic Retrofit of Buildings" Narosa publication house, New delhi.
4	A.K.Sharma and R. Subramanian "Handbook on Repair & Rehabilitation of Reinforced Concrete building".
5	P.Srinivasan&S.Vaidyanathan"Handbook of Machine Foundations" SERC Chennai.