

GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL (GEOTECHNICAL ENGINEERING) (43)

SOIL DYNAMICS AND MACHINE FOUNDATIONS

SUBJECT CODE: 2714302

SEMESTER: I

Type of course: Major Elective-I

Prerequisite: NA

Rationale: Machine foundation design is required to equip the students with understanding of analysis and design of various machines

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	PA (V)		PA (I)			
					ESE	OEP	PA	RP		
3	2	2	5	70	30	20	10	20	0	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction: Basic terminologies as per IS 1893 - Machine foundation: Types, general requirement design data, permissible amplitude, bearing pressure	5	15
2	Evaluation of Design Parameters: Evaluation of geometrical properties and physical properties of elastic base	5	10
3	Analysis and Design of Block Foundation: Degrees of freedom - analysis under different modes of vibration, Analysis of Two Degree freedom systems under free and forced vibrations -Principles of Design of Foundations for reciprocating and impact machines as per IS code.	15	25
4	Analysis and Design of Framed Foundation: Design data,planning criteria,dynamic analysis and design as per IS Code	10	20
5	Vibration Isolation Types and methods – Isolating materials and their properties	5	20
6	Liquefaction of soil: Factors influencing – liquefaction potential – Analysis from SPT data.	5	10

Reference Books:

1. Das B M, "Fundamental of Soil Dynamics", Elsevier Scientific Publishing Co., NewYork,1983
2. Barkan D D, "Dynamics of Bases of Foundations", McGraw Hill Book Co. Inc., New York
3. Srinivashula P & Vaidyanathan C V, Handbook of "Machine Foundation", McGraw Hill, 1986

4. Prakash S & Puri V K, "Foundations for Machines", McGraw Hill, 1987
5. Bykhovsky I, "Fundamentals of vibration engineering "
6. Winterkorn Hans, Fang Hsai Yang, "Foundation Engg Handbook ", Galgottia Publications

Course Outcome:

After learning the course the students should be able to:

1. Understand basic design criteria and design parameters for machine design
2. Build on the knowledge and understanding of soil behavior pertaining to different foundations
3. Understand the numerical modeling of soil under machine foundation
4. Design various machine foundation as per requirement on field

List of Experiments:

Open Ended Problems:

Major Equipments:

List of Open Source Software/learning website: