

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology				Branch/Spec.	CIVIL Engineering			
Semester	VI				Version	2.0.0.0			
Effective from Academic Year	2019-20				Effective for the batch Admitted in	2014-2015			
Subject code	2CI 603		Subject Name	FOUNDATION ENGINEERING					
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:									
GEOTECHNICAL ENGINEERING									
Learning Outcome:									
Upon successful completion of the subject Foundation Engineering students will have knowledge on how to design foundations on soil considering its properties and suitability. They will also have knowledge of how to determine bearing capacity of shallow and pile foundations considering various analyses.									
Theory syllabus									
Unit	Content								Hrs
1	Introduction: Types of foundation, Factors affecting the selection of type of foundations, steps in choosing types of foundation.								7
2	Subsurface Investigation: Objectives of exploration, planning of exploration program, soil samples and soil samplers, field penetration tests: SPT, SCPT, DCPT. Introduction to geophysical methods, Bore log and report writing.								7
3	Bearing Capacity of Shallow Foundation : Introduction, significant depth, design criteria, modes of shear failures.Detail study of bearing capacity theories (Prandtl, Rankine, Terzaghi, Skempton), bearing capacity determination using IS Code, Presumptive bearing capacity. Settlement, components of settlement & its estimation, permissible settlement, Proportioning of footing for equal settlement, allowable bearing pressure. Bearing capacity by use of penetration test data and by plate load Test.Bearing capacity of raft. Factors affecting bearing capacity including Water-Table. Contact pressure under rigid and flexible footings. Floating foundation.Types of pavements & its design.								8
4	Pile foundations : Introduction, load transfer mechanism, types of piles according to their composition, their								5

	method of installation and their load carrying characteristics, piles subjected to vertical loads- pile load carrying capacity from static formula,dynamic formulae (ENR and Hiley), penetration test data & Pile load test.Pile group: carrying capacity, efficiency and settlement. Negative skin friction.	
5	Foundations on Expansive Soil: Significant characteristics of expansive soil, footing on such soils, Problems and preventive measures. Under-reamed pile foundation-its concept, design & field installation.Significant characteristics of silt and loess, problems & remedial measures, footing on such soils.	5
6	Earthquake Geotechnics and GeoSynthetics: Geosynthetics; type's, functional properties and requirements. Geosynthetic applications in Civil Engineering. Earthquake Geotechnics, Types of earthquakes. Seismic waves, Location of earthquakes, Strength of an earthquake,Strong ground motion, Factors influencing ground motion, Seismic hazards, liquefaction,Effect of liquefaction on Built Environment, Evaluation of liquefaction susceptibility,Reduction of liquefaction hazard.	5
Practical content		
Practical and Term work shall be based on the above mentioned course content.		
Text Books		
1	Arora K.R.; Soil Mechanics & Foundation Engineering ,Standard Publisher	
2	B.C.Punamia ; Soil Mechanics & Foundation Engineering ,Laxmi Publication	
Reference Books		
1	Murthy V.N.S.; Soil Mechanics & Foundation Engg Vol.I ,CBS Publication ; 1ST edition	
2	Peck Ralph B., Thornburn Thomas H., Hanson Walter E.; Foundation Engineering,John Wiley & Sons; 2nd Edition edition	
3	Das Braja M; Principles of Foundation Engineering,Publishe byCengage Learning	
4	Singh Alam : Modern Geotechnical Engineering,CBS Publishers & Distributors; 3rd edition	
5	Code of practice for determination of bearing capacity of shallow foundation IS:6403	
6	Code of practice for design and construction of pile foundation- IS:2911 (Part I to IV)	
7	Method for standard penetration test for soil- IS:2131	
8	Code of practice for subsurface investigation for foundation- IS:1892	
9	Code of practice for structural safety of buildings: Shallow Foundations- IS:1904	
10	Code of practice for calculation of settlement of foundations- IS:8009	