

Name of Faculty: Prof. Rashid Mustafa	
Discipline: Civil Engineering(7th Semester)	
College: Katihar Engineering College	
Subject: Foundation Engineering (011722)	
Course Credit : 03	
Course Objective	Provide students with knowledge of geographical investigation, site investigation, bearing capacity of soil, various in-situ test of soil, pile foundation and machine foundation.
Subject Synopsis/ Indicative Syllabus	<p>Explorations: Geographical Investigation, Characterization of ground, site investigations, method of drilling, sampling.</p> <p>Bearing Capacity: General, local and punching shear failures, correction for size, shape, depth, water table, eccentricity, ultimate and allowable Bearing capacities, Effect of ground water level.</p> <p>In-situ tests : SPT, CPT, plates load tests, methods for ultimate bearing capacity based on in situ tests.</p> <p>Settlement of foundations: Pile foundation : Introduction, Pile classification, Pile installation, cast in sine pile, Driven pile, and load carrying capacity of pile by static and dynamic methods, Pile load test, Pile groups, laterally loaded piles.</p> <p>Expansive Soils : Identification, swelling pressure, Foundation on expansive soil, Stabilization of expansive soils.</p> <p>Machine foundations : Types, Basic definitions. Degree of Freedom of a Block foundation, General criteria for design of machine foundation, 'Free and forced Vibrations and machine foundations subjected in impact loads.</p> <p>Caisson and Well Foundation:- Types of Caisson, Components of Well foundation, Stability analysis of well foundation, Tilt and Shift.</p> <p>Bridge foundations caissons: Coffer dams. Excavation and dewatering for foundation. Failures and strengthening, Foundations on weak soils, reclaimed areas, swelling soils and foundations on expansive soils, arching in soil.</p>
Gate Syllabus of Soil Mechanics	Sub-surface investigations - scope, drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories -Rankine and Coulomb; Stability of slopes - finite and infinite slopes, method of slices and Bishop's method; Stress distribution in soils - Boussinesq's and Westergaard's theories, pressure bulbs; Shallow foundations - Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations - types of piles, dynamic and static formulae, load capacity of piles in sands and clays, pile load test, negative skin friction.
Reading List and References	<p>Recommended Text Basic and Applied Soil Mechanics by Gopal Ranjan and A.S.R.Rao</p> <p>References Das, B M "Introduction to Geotechnical Engineering". ISE. 2nd edition, 2008, Thomson. Murthy, V.N.S "Soil Mechanics and Foundation Engineering". STC 4th edition, 1993. Arora, K.R. "Soil Mechanics and Foundation Engineering". Standard Pub. And Dist.,Delhi.,1992</p>