



SUBSURFACE EXPLORATION :IMPORTANCE AND TECHNIQUES INVOLVED

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PRE-REQUISITES : Engineering would be minimum qualification to know basic soil mechanics.

INTENDED AUDIENCE : Btech, Mtech, PhD students, industrial engineers, designers and people from field investigation firms

INDUSTRY SUPPORT : Larsen and Toubro/ Risk Management Solution/ Gammon/ Nagarjuna construction may find the course useful.

COURSE OUTLINE :

This course covers the requirement of thorough subsurface investigation, its important in planning and execution of the project. Classification of investigations to be adopted and challenges faced during many of the most complex civil engineering projects across the globe. Detailed discussion on methodologies starting with borehole drilling, rock drilling to advance methods such as electrical resistivity, geophysical tests, sounding, magnetic anomaly, dilatometer test, pressuremeter tests, ground penetrating radar will be covered along with numerical problems at various stages. In addition, dynamic testing on piles which is a very hot topic these days will be covered in the course.

ABOUT INSTRUCTOR :

Prof. Abhishek Kumar did his Diploma and Bachelor in Civil Engineering from Aligarh Muslim University, Aligarh by the year 2007. Later, joined for ME in department of Civil Engineering at IISc Bangalore where he converted to PhD in 2008. In August 2013 after defending his PhD thesis, Dr Abhishek Kumar joined Larsen and Toubro as Assistant Engineering Manager where he was involved in developing guidelines for field investigations particularly related to seismic aspects. Later, in May 2014, Dr Kumar joined department of Civil Engineering, IIT Guwahati as Assistant Professor. He has so far guided 5 Mtech thesis, one PhD thesis has been submitted under his supervision while two more are under progress. He is recipient of Young Engineers Award 2015 from Indian National Academy of Engineering (INAE) and Institution of Engineers. He is also recipient of INSPIRE faculty award from Department of Science and Technology. In addition, he is also principal investigator for a research project under Ministry of Earth Sciences, Govt. of India.

COURSE PLAN :

Week 1: Importance of site investigation, Classification of investigations

Week 2: Test Pits+ Borings, Ground water table and rock drilling, Standard Penetration Test

Week 3: Cone Penetration test, Dilatometer Test, Pressuremeter Test

Week 4: Seismic refraction survey, Seismic reflection survey, Electrical Resistivity Test, Magnetic anomaly test

Week 5: Suspension logging test, Gravity test, Offshore and onshore investigations

Week 6: Drill ships, barges, Jacket up platforms, positioning, Anchored structure, pipelines

Week 7: Terminologies in Pile foundation

Week 8: Pile drivability test, Pulse Echo Method (PEM)