



# SUBSURFACE EXPLORATION :IMPORTANCE AND TECHNIQUES INVOLVED

## PROF. ABHISHEK KUMAR

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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 importance 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 advanced 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 is working as an Assistant Professor, Department of Computer Science, Institute of Science at Banaras Hindu University. His experience in academic and production environment has prepared him to be an effective Team Leader & mentor of 3D Animation, Computer Graphics, Visual Effects & Design engineering Industry. His technical proficiency & research journal papers have covered a wide range of topics in various Digital Art areas (Image analysis, visual Identity, Graphics, Digital Photography, Motion graphics, 3D Animation, Visual Effects, Editing and Compositing). Through his experience as a Mentor at MAAC (Maya Academy of Advanced Cinematics) Training Centers (India) & Assistant Professor at Banaras Hindu University, He has developed confidence and an interest in teaching. He is actively involved in development of the courseware of Animation & design engineering course for various Institutions & Universities as per future industry requirement.

### 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)