



GEOTECHNICAL ENGINEERING- 1

PROF. DEVENDRA NARAIN SINGH

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PRE-REQUISITES : Engineering Geology

INTENDED AUDIENCE : Civil Engineering

INDUSTRIES APPLICABLE TO : All companies that deal with the Civil infrastructure development

COURSE OUTLINE :

Geotechnical Engineering-1 deals with the fundamental aspects of soil starting from its origin to various engineering applications. The course discusses the basic classification, characterization, hydraulic and mechanical properties of soils in depth. The expected outcome of the course is to make the students familiarize with soil and to showcase its behavior during various engineering applications such as foundation, retaining wall etc.

ABOUT INSTRUCTOR :

Prof. Devendra Narain Singh is an Institute Chair Professor in Department of Civil Engineering at Indian Institute of Technology Bombay. He obtained his Bachelors, Masters and Ph. D degrees from Indian Institute of Technology Kanpur. His research focuses are geomaterial characterization, contaminant-geomaterial interaction, sensors for soil moisture measurement, modelling of heat migration through soils, utilization of industrial by-products, municipal solid waste management and other fields associated with Environmental Geotechnics. He guided 36 Ph. Ds and 35 Master students and several are on-going. He is the editor-in-chief for the journal Environmental Geotechnics, ICE (UK).

COURSE PLAN :

Week 1: Origin of Soils and Rocks, Rock cycle

Week 2: Basic relationships, Index properties of aggregates

Week 3: Soil structure, Soil classification

Week 4: Soil compaction

Week 5: Soil-water Statics

Week 6: Flow through soils, Quick sand condition

Week 7: Permeability and methods for its determination

Week 8: Flow-nets, Stresses in soil from surface loads

Week 9: Boussinesq theory

Week 10: New marks chart, Contact pressures

Week 11: Consolidation of soils

Week 12: Settlement of compressible soil layers