

# GEOTECHNICAL ENGINEERING 101

FRIDAY, FEBRUARY 20

10:00 AM - 11:30 AM | ZOOM

## What Is Geotechnical Engineering & Why It Matters

- *Soil, rock, and groundwater engineering*
- *Ground performance, safety, and cost*
- *Geotechnical origin of many infrastructure failures*

## Nature of Soil

- *Natural, variable, three-phase material*
- *Loading, drainage, and stress history effects*
- *Significant site-to-site variability*

## Soil Properties & Classification

- *Soil behavior indicators*
- *Grain size, plasticity, and density*
- *Unified Soil Classification System (USCS)*

## Permeability & Seepage

- *Water flow through soil*
- *Erosion, uplift, and instability risks*
- *Drainage importance*

## Stresses in Soils

- *Total stress and pore water pressure*
- *Effective stress concept*
- *Groundwater influence*

## Compressibility & Settlement

- *Soil compression under load*
- *Differential settlement damage*
- *Time-dependent deformation*

## Shear Strength of Soils

- *Slope and foundation stability*
- *Sand versus clay behavior*
- *Stress and drainage dependence*

## Geotechnical Hazards

- *Landslides and liquefaction*
- *Earthquake and rainfall triggers*
- *Soil amplification effects*

## Soil Improvement

- *Engineered ground modification*
- *Densification, reinforcement, drainage*
- *Risk reduction and performance enhancement*

REGISTER NOW

MEMBERS \$35

NON-MEMBERS \$75



**ALI SHAFIEE, PH.D., PE, GE**  
ASSOCIATE PROFESSOR

CALIFORNIA STATE POLYTECHNIC  
UNIVERSITY POMONA