

Course Contents:

Introduction: Course overview • Generation and disposal strategies of mine tailings • Challenges in management of mine tailings • Possible reusability of mine tailings • Role of geotechnical engineering in sustainable management of mine tailings;

Geotechnical characterisation of tailings: Gradational properties, specific gravity • Plasticity properties and mineralogy • Densification - settlement, consolidation, evaporation, dewatering • Drained and undrained strengths • Triaxial testing and analysis • Simple shear testing and analysis • Cone penetration testing • Introduction to “state parameter” • Application of critical state soil mechanics to interpret test results • Hydraulic conductivity • Water retention and volume change behaviour • Testing methods for understanding unsaturated response of the material;

Disposal of tailings in TSFs : Types of components of TSFs • Physical processes involved in a typical TSF • Failure mechanism of TSFs • Health monitoring of TSFs • Operator manual, Trigger Action Response Plans (TARPs) • Global Industry Standard on Tailings Management (GISTM) • Governance structure for management of TSFs, stakeholder engagement;

Case studies and interaction with industry professionals Forensics of failure: Merriespruit, South Africa, 1994 • Mount Polley, Canada, 2014 • Cadia, Australia, 2018 • Brumadinho, Brazil, 2019 • Few case studies from India • Invited guest lectures by industry professionals and academic colleagues on current practice of tailings management • Possible visit to a TSF site