CLASsroom, LAB and Field Instruction FROM Industry LEADERS

MONDAY, SEPTEMBER 18
Overview of the Course and the Global Tunneling Scene
Mike Mooney, Professor and Greweck Chair of Underground Construction and Tunneling, Colorado School of Mines
Tunnel Project Planning: From Conception through Construction and Operations
Sanja Zlatanic, Senior Vice President and Chair, National Tunnel Practice, HNTB
Geological and Geotechnical Site Investigation and Characterization including GDRs
Red Robinson, Senior Vice President, Shannon & Wilson Inc.
Risk Management
Bob Goodfellow, Senior Vice President, Aldea Services
Contracting Methods and Project Delivery Options
Dan Adams, President, McMillen Jacobs Associates
Geotechnical Baseline Reports
Randy Exsee, Executive Vice President, Mott MacDonald
Risk Management through Instrumentation and Monitoring
Allen Marr, CEO, Geocomp
Hands-On Labs (see sidebar for topics)

TUESDAY, SEPTEMBER 19
Openings and Support in Rock and Soil
Seth Pollack, Associate, ARUP
Gabe Walton, Assistant Professor of Underground Construction and Tunnel Engineering and Geological Engineering, Colorado School of Mines
NATM and SEM
Vojtech Gall, Principal, Gall Zeidler Consultants
Nasri Munfah, Senior Vice President and Director of Global Tunneling, WSP | Parsons Brinckerhoff
Conventional Excavation: Drill and Blast and Roadheaders
Skanska, Speaker(s) to be announced
Shotcrete: Temporary and Permanent Lining Design and Construction
Jim Lindsay, Head of USC North America, BASF Corporation
Martin Mannatt-Russell, Global Technical Manager, Mechanized Shield Tunneling, BASF Corporation
Building Stations from Pilot Tunnels: Innovation from Crossrail London
Speaker(s) to be announced
Principles of Hard Rock TBM Tunneling
Jamal Rostami, Associate Professor and Hadden/Alacer Gold Endowed Chair in Mining Engineering, Colorado School of Mines
Innovations and Trends in Hard Rock TBM Tunneling
Dennis Ofiara, Chief Engineer, The Robbins Company
Probe-Hole Drilling and Pre-Excavation Grouting for Groundwater Control
Niels Koefed, Tunnel Manager, Rondaust, Kiewit
Hands-On Labs (see sidebar for topics)

WEDNESDAY, SEPTEMBER 20
Principles of Pressurized Face TBM Tunneling: EPB, Slurry and Hybrid
Mike Mooney, Colorado School of Mines
Applications, Design and Performance of EPB, SPB and Hybrid TBMs
Werner Burger, Chief Engineer, Herronknecht AG
Innovative TBM Tunneling in Hong Kong: From Small TBMs for Cross Passage Construction to the 17.6m Largest Maschield TBM in the World
Bruno Combe, Director of Tunneling, Bouygues Construction
Roger Story, Technical and Risk Manager, Dragages Hong Kong Limited
Learning from Data
Speaker(s) to be announced
Tunnel-Induced Deformation of Ground, Buildings and Utilities
Speaker(s) to be announced
SR99: Lessons from the Largest EPB TBM Tunnel in the World
Chris Dixon, Project Manager, Seattle Tunnel Partners
Juan Luis Magro, Construction Manager, Dragados USA and Seattle Tunnel Partners
Precast Segmental Liner Design and Construction
Anthony Harding, Regional Practice Leader, Tunnels and Earth Engineering, CH2M
Ground Improvement: Dewatering to Ground Freezing to Grouting
Paul Schmall, Senior Vice President and Chief Engineer, Mierotrench
Regional Connector: TBM Tunneling, Deformation Control, Cross Passages and the Cavern
Tayarly Bros., Speaker(s) to be announced
Hands-On Labs (see sidebar for topics)

THURSDAY, SEPTEMBER 21
Safety Design and Delivery
Matt Swinton, Senior Vice President and District Manager, Kiewit
Construction Management
Greg Colzani, Tunnel Construction Management Leader, Jacobs
Cost Estimating
Mike DiPino, Executive Vice President, Jay Dee Constructors
Owners Panel: Specifications, Risk Sharing and the Future of Procurement
John Bednarzki, Southern California Metropolitan Water District
Matthew Crow, Los Angeles Metro
Additional panelists to be announced

COURSE DIRECTORS:
Mike Mooney and Gabe Walton, Colorado School of Mines
CONTINUING EDUCATION UNITS: 2.3
Visit our website for the most up-to-date program and to register for this course online: underground.mines.edu/tunneling

Profits from this short course directly fund tunneling education and research at Colorado School of Mines. Your registration dollars support programs, materials and internships for Mines students and allow applied research and student training in underground construction and tunnel engineering to flourish. Visit our website for more information at underground.mines.edu.

HANDS-ON LABS AND DEMOS
Break-out lab and demo sessions round out each day of instruction, providing attendees with hands-on experience in these areas:

EPB Soil Conditioning — Experiment with different foams and polymers to see how these additives influence the behavior of a variety of soils.
Rock Cutting — Explore hard-rock cutting principles and challenges with samples of fractured rock.
Slurry — Design, batch, and examine, a variety of slurries used in tunneling environments via numerous test methods.
EPB TBM Simulator — Operate an EPB TBM in a virtual environment; learn how to control face pressure, control ground deformation and advance speed through interactive trial and error.
Numerical Modeling — Work through numerical modeling exercises, highlighting modeling assumptions and limitations for tunneling applications.
Shotcrete — Learn and implement shotcrete mix fundamentals, participate in wet and dry mix spraying, and perform verification tests on fresh and mature shotcrete.
Blasting Design — Design the blast round for a tunnel heading based on cut, face, buffer and contour line holes; discuss charge density to achieve high yield and minimal wall damage.
Annuas Grout — Learn mix-design fundamentals and perform simple tests with grouts, fibers, steel and polymers.
 Abrasivity and Wear — Review fundamentals of rock and soil abrasivity and evaluate abrasivity in geometrals.
Tunneling Geology Walk — Learn about applied geology and geotechnical characterization of rock masses for tunneling during an outdoor exploration of rock outcrops in Golden, Colorado.
3D Geotechnical Site Investigation and BIM — Work with 3D renderings of geotechnical site investigations and discuss tunnel alignment and building information management (BIM).