

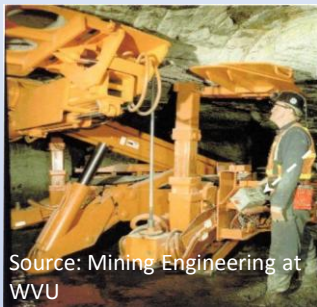
You are cordially invited to a two-day workshop organized by
Minerals, Metals and Materials Technology Centre (M3TC) on

Workshop on Planning and Design for Ground Control in Underground Coal Mines

Presented by

Professor Yoginder P. Chugh

University of Southern Illinois, USA



Topics to be covered include:

- Pre-mining investigations for assessing ground control issues in partial extraction and high extraction
- Mining systems and design
- Rock mass classifications pertinent to coal mining
- Engineering property requirements
- Design approaches for openings and pillars for partial extraction and longwall mining
- Rock mass reinforcement through primary and secondary supports
- Surface subsidence

ADMISSION IS FREE*

Formal certificates will be given at the end of the workshop to the participants

June 29-30, 2010 (Tuesday and Wednesday)

9.00am to 5.00pm

EA-06-05, Faculty of Engineering, National University of Singapore

[NUS Campus Map](#) & [NUS: Faculty of Engineering](#)

Contact Number: (+65) 65168296

Please register and confirm your attendance via email: engnrma@nus.edu.sg

Please visit our website for more details, <http://www.m3tc.sg/>

* Industry, government and academic personnel with appropriate technical background are invited to attend.

Minerals, Metals and Materials Technology Centre (M3TC)

Minerals, Metals and Materials Technology Centre (M3TC) was established in the Faculty of Engineering, National University of Singapore with the support from Economic Development Board in April 2007.

M3TC is a unique R&D centre that is actively involved in natural resources with particular emphasis on application based, Research Development and demonstration (RD&D) activities. Over the past 2 years, M3TC has delivered technological solutions to both the local and regional minerals industry across a range of commodities.

M3TC has also contributed specialist expertise to the consulting and professional development activities of relevant companies.

The centre's research aims to transform the minerals industry and has been able to generate cutting edge research work that optimizes the extraction and processing of minerals. It is our vision to become globally recognized in the minerals sector.

Prof Yoginder Chugh

Dr Yoginder Paul Chugh is currently professor at Southern Illinois University, USA. Since his undergraduate studies, his interests focused on mining engineering. He continued this momentum to obtain his MS and PhD degrees in Mining Engineering from Penn State University, Pennsylvania, USA in 1968 and 1971, respectively.

Prof Chugh has conducted numerous short courses and has been invited as a keynote or plenary speaker throughout the world. In 2009, he was invited to serve on a highly prestigious international task force, "Sustainable Use of Coal in China" under the China Council for International Cooperation on Environment and Development (CCICED) umbrella.

Research and scholarly work have been an integral part of his professional life. His research interests and specialties are mainly in Applied Rock Mechanics and Ground Control, Coal Combustion Byproducts Management, Dust Control in Coal Mining Face Areas, and Mining Systems. Prof Chugh has 7 patents and 3 intellectual property disclosures under his name.

For Prof Chugh's full CV please visit our website at <http://www.m3tc.sg/>

Title of Workshop : **Planning and Design for Ground Control in Underground Coal Mines**

Date : **29 June 2010 - 30 June 2010**

Time : **9.00am - 5.00pm**

Venue : **EA-06-05, Faculty of Engineering**

Conducted By : **Professor Yoginder P. Chugh from Southern Illinois University, USA**

Day 1: 29 June 2010, Tuesday

Time	Agenda / Topics to be Covered
0900	Introduction
0915	Workshop Goals
0930	Importance and Scope of Ground Control in Mining (shaft pillars, size of openings and pillars, size of supports, surface and subsurface impacts and mitigation)
0945	Foundations of Ground Control (Section I) - Concepts of forces and analysis of stresses - Analysis of strains and displacements - Pre- and post-excavation state of stress - Concept of stress concentration factor - Engineering properties of rocks/rock mass and concept of failure criterion
1015	<i>Coffee Break (Refreshments Provided)</i>
1030	Continuation of Section I
1200	<i>Lunch Break</i>
1300	Open Discussion
1400	Rock Mass Classification Systems and their Applications - Rock Quality Designation (RQD) - Rock Mass Rating (RMR) - Coal Mine Roof Rating (CMRR)
1500	<i>Coffee Break (Refreshments Provided)</i>
1515	Openings Design (Section II) - Homogeneous rock mass - Stratified rock mass - Jointed rock mass
1630	Open Discussion and Adjournment

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Day 2: 30 June 2010, Wednesday

Time	Agenda / Topics to be Covered
0900	Open Discussion
0930	Pillar Design in Partial and High Extraction Mining Systems (Section III) - Tributary area theory - Design in partial extraction mining - Design in high extraction mining - Interaction between roof, pillar and floor elements - Design for weak floor conditions
1015	<i>Coffee Break (Refreshments Provided)</i>
1030	Open Discussion
1100	Pre-mining Investigations for Ground Control - Planning for pre-mining investigations - Coring and core studies - Geotechnical studies on cores - Analysis of data from pre-mining investigations
1200	<i>Lunch Break</i>
1300	Open Discussion
1330	Rock Mass Reinforcement Concepts - Bolting - Trusses - Standing supports
1445	<i>Coffee Break (Refreshments Provided)</i>
1500	Mine Subsidence Principles (Section IV) - Concepts of subsidence - Subsidence related impacts - Subsidence related impacts - Subsidence prediction
1630	Open Discussion and Adjournment