

**OPEN PIT MINE & DUMP
DESIGN USING GEOVIA GEMS**

Location

University of Alberta, Edmonton, Canada

Dates

December 1st-2nd, 2020 - 2 days, 8:30-16:30

Early Registration Deadline - 10% discount

Monday, November 2nd, 2020

Registration Deadline

Monday, November 23rd, 2020

Course Fee

CAD \$1600 (excluding taxes)

Instructor

Hooman Askari is a professor of mining engineering in the School of Mining and Petroleum Engineering at the University of Alberta, Canada. He teaches and conducts research into mine planning & design and simulation of mining systems. Hooman is a registered professional mining engineer with 22 years of operational, consulting, research, and teaching experience in the area of open pit mine planning and design. He has a strong track record of success in leading the [Mining Optimization Laboratory \(MOL\)](#) research team sponsored by industry partners into development, testing, and delivering mine planning optimization prototype software and mine simulation models to major mining companies. He consults as the Principal Engineer on long-term to short-term open pit production scheduling optimization and simulation of mining-systems through [OptiTek Mining Consulting Ltd.](#)

Registration

Send the completed registration form to: registration@optitek.ca

For more information contact **Hooman Askari** at: hooman@optitek.ca

Phone: +1 (780) 893-9365

Who Should Attend

Open Pit Mine Design is a two-day course designed for mine planners, mining engineers, and geologist who are responsible for activities that require them to design and manage pits, ramps, switchbacks, slots, and waste dumps. It is ideally suited to those from industry who wish to gain a more in depth knowledge of modern mine planning and design theory and software tools.

Cancellation Policy

Notification of cancellation received in writing by **Monday, November 23rd, 2020** will incur a 20% cancellation fee. No refund will be made after this time. Registrants who are "no-shows", will not qualify for a refund.

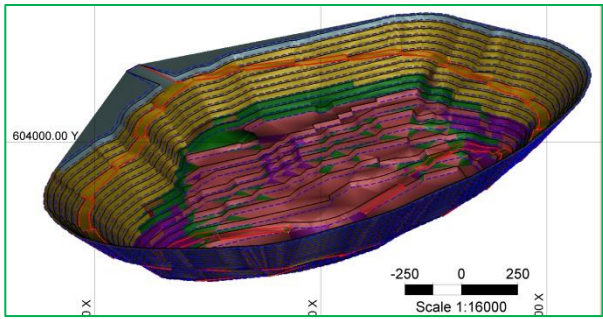
Mining Optimization Laboratory (MOL)

The Mining Optimization Laboratory (MOL) is an industrial research consortium sponsored by mining companies. The MOL research focuses on two major themes:

- Mine Planning and Design.
- Simulation Optimization of Mining Systems.

MOL research focuses on using operations research and advanced analytical methods such as mathematical modeling, optimization, discrete event/continuous simulation, and intelligent agents to arrive optimal or near-optimal solutions to complex, large-scale mine planning/operations decision-making problems.

<http://www.ualberta.ca/MOL/>



Participants are Required to Bring a Laptop
Software will be Provided for the Course

First Name: _____

Last Name: _____

Company Name: _____

Job Title: _____

Address: _____

City: _____

Prov/ State: _____

Country: _____

Email: _____

Phone: _____

Fax: _____

Visa Master Card

PO By Phone

Card # _____

Expiry ____/____

CVV: _____

(Fee + 5% GST) CDN\$ _____

Name on Card: _____

Signature: _____

COURSE DESCRIPTION

Software: GEOVIA GEMS

Open Pit Mine Design is a two-day course designed for mine planners, mining engineers, geologist, and people who are responsible for activities that require them to design and manage pits, ramps, switchbacks, slots, and waste dumps. The participants will complete a pit-design project during the course. The course covers open pit design terminology, selection of loading and hauling equipment based on targeted annual production, working and safety bench geometry calculations, haul road parameters and geometric design. Prior to engaging in pit design, the course reviews principles and fundamental concepts in creating points, polylines, and triangulations; generations of plans and sections; also surface and solid modeling for the purpose of open pit design. The course includes a step-by-step project for top-down and bottom-up pit design. The project starts from the final optimal pit shell, intermediate pits shells, and the long-term schedule generated in Whittle. It covers topics on how to choose the required parameters such as berm width, variable pit slope angle, and batter angle to achieve a desired pit and dump design. The project continues with creating surface triangulations from the pit design, obtaining volumes, tonnages and grades reported by bench, rock type and grade range from the designed pit.

Outcomes of the course include:

- Understand pit design parameters & components
- Understand pit design theory
- Use optimal pit shells in pit design
- Select loading and hauling equipment
- Define Bench geometry as a function of equipment specs
- Understand haul road design
- Design of toes, crests, ramps, switchbacks and slots
- Define berm width, pit slope angle and batter angle
- Create final pit designs and surfaces from the designs
- Obtain volumes, tonnages and grades reported by bench
- Design variable pit slopes
- Handle multi-benching
- Manage single-pit splitting to multi-pits
- Design variable pit slopes based on rock-types
- Carryout multi-benching
- Design waste dumps

Day 1

- Open Pit Terminology & Calculations
 - Bench Face, Crest, Toe
 - Bench Height and Width
 - Berm, Batter Angel, Bank Width
- Selection of Loading & Hauling Equipment
 - Shovel size selection
 - Bucket capacity selection
 - Theoretical cycle time
 - Fill factor, efficiency, and availability
 - Determination of shovel geometry
 - Dumping radius and height
 - Shovel Selection from OEM literature
 - Haulage truck selection
- Bench Geometry and Equipment Specifications
 - Shovel working range specifications
 - Haul truck OEM specifications
 - Working bench width calculations
 - Safety bench width calculations
- Haul Road Design
 - Haul road design parameters
 - Haul road geometric design
 - Optimal and maximum sustained grades
 - Horizontal (longitudinal) alignment
 - Road width calculations
 - Curvature and switchbacks
 - Safety berms
 - Ditches and drainage
 - Estimating haul road rolling resistance
- Polyline Tools
 - Advance GEMS polyline tools
 - Create status line types/ user profiles
 - Create polyline workspaces
 - Digitize/edit and select polylines
 - Create boundary polygons
 - Multiline
 - Creating polylines for pit design
- Pit Design Project Set Up
 - Create pit design project workspaces
 - Create/modify status line types
 - Create/modify bench profiles
- Pit Design Parameters
 - General design parameters
 - Define bench parameters
 - Define ramp slot parameters
 - Define rock code parameters

Day 2

- Import LG Optimal Pit Shells & Schedule
- Open Pit Design
 - How many benches?
 - Deepest bench?
 - Top bench
 - Pit design steps
 - Bottom to top design tools
 - Top to bottom design tools
 - Set current bench/toe
 - Create new toe/crest lines
 - Automatic fix features
 - Activate feature
 - Create ramp entrance
 - Ramp generation and automated pit design
 - Expand single bench
 - Expand multiple benches
 - Create slot entrance & switchbacks
 - Create line for opposite ramping
 - Single pit splitting into multiple pits
 - Complete the design
 - Typical pit design issues and errors
- Variable Pit Slopes
 - Defining geotechnical domains
 - Blending?
 - Defining slope domains for the pit
- Multi-Benching
- Creating a Surface from Pit Designs
 - Create TIN Surface
 - Create a pit surface
 - Combine the pit surface with topography
 - Surface Creation Errors
- Calculating and Categorizing Volumes
 - Volumetric reports (tonnes/grades)
 - Volumetric settings
 - Volume between two surfaces
 - Volume by bench
 - Grades and tonnages
- Dump Design
 - General dump design parameters
 - Define bench parameters
 - Set current bench/toe
 - Create new toe/crest lines
 - Create ramp entrance
 - Expand single bench
 - Expand multiple benches